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Cumulative Effects of Doubling-up in Childhood on Young Adult Outcomes

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Abstract

Doubling-up is a common experience – nearly half of kids experience at least one double-up during childhood – yet we know little about the cumulative effects of these households on children. This study estimates the effects on young adult health and educational attainment of childhood years spent in three doubled-up household types: 1) those formed with children's grandparent(s), 2) those formed with children's adult sibling(s), and 3) those formed with other extended family or non-kin. Using marginal structural models and inverse probability of treatment weighting, methods that account for the fact that household composition is both a cause and consequence of other family characteristics, I find that doubling-up shapes children's life chances, but the effects vary depending on the relationships between household members. While childhood years spent living with extended family or non-kin are associated with worse young adult outcomes, co-residence with a grandparent is not significantly associated with young adult outcomes after accounting for selection into these households, and co-residence with an adult sibling may be beneficial in some domains. By studying the effects of co-residence with adults beyond the nuclear family, this research contributes to a fuller understanding of the implications of family complexity for children.

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Introduction

Children's lives are profoundly affected by the adults with whom they live. Previous research has linked family structure to a variety of behavioral and cognitive childhood outcomes, as well as young adult outcomes such as family formation and employment (McLanahan and Percheski 2008; McLanahan, Tach, and Schneider 2013). This research has largely focused on the nuclear[1] family – the presence or absence of a father or other romantic partner of the mother and the children such partners bring into the household. Yet looking only at parents' romantic partners and their minor children does not capture the full household experience of many children, particularly those from low-income families, who often spend at least part of their childhood in a household with a more complicated array of residents. Doubling-up – when a nuclear family co-resides with other adults, like grandparents, extended family, or friends – is a common childhood experience. Nearly half of mothers living in urban areas reside in a doubled-up household before their child reaches age ten (Pilkauskas, Garfinkel, and McLanahan 2014). Despite extensive research on family structure, we know less about how the presence of extended household members affects children.

One reason that doubled-up households are relatively neglected in the family literature may be that they are often considered more of a housing arrangement than a family form (e.g., Skobba and Goetz 2013). Yet, like family structure, household composition shapes children's lives in myriad ways. Doubling-up affects children's access to resources and caregiving time and influences parents' stress levels (Harvey 2015; Kalil, Ryan, and Chor 2014; Mutchler and Baker 2009). In this study, I conceptualize doubled-up households not just as a residential outcome, but also as social environment. I attend to the relational aspects of doubled-up households by considering how the effects of doubling-up may vary based on familial or non-familial relationships between household members. By studying the effects of co-residence with adults beyond the nuclear family, this research contributes to a fuller understanding of the implications of household complexity for children. Moreover, rates of doubling-up increased substantially during the Great Recession (Mykyta and Maccartney 2012), and documenting the effects of these households and how they may vary by household type is important for considering potential repercussions of these changes.

The high degree of instability that characterizes many children's households (Fomby and Cherlin 2007; Perkins 2015) complicates studies of the effects of household complexity on children's long-term outcomes. Children's outcomes are shaped not only by their immediate household environment, but also by the sum of environments they have experienced in the past. Early environments put in motion processes of cumulative advantage and disadvantage which ultimately shape outcomes later in the life course (Elder 1998). Thus, a longitudinal approach, which accounts for household composition throughout childhood, is necessary for understanding long-term effects. Yet, as I discuss later, accurately modeling cumulative effects poses methodological challenges, and studies have tended to estimate the impact of household composition at a single point in time (Astone and Washington 1994; DeLeire and Kalil 2002). These cross-sectional measures ignore the dynamic nature of households for many children. This limitation is particularly problematic for doubled-up households, as most double-ups dissolve

[1] Throughout the paper, I refer to the mother, child(ren), and mother's co-resident romantic partner, if applicable, as the nuclear family. I use this term to differentiate this normative family unit from extended household members.

within a year (Glick and Van Hook 2011), and many children transition in and out of doubled-up households multiple times (Mollborn, Fomby, and Dennis 2012; Pilkauskas 2012).

In this paper, I estimate the cumulative effects of the total number of childhood years spent in doubled-up households on young adult health and educational attainment. Recognizing that relationships between doubled-up household members are important for how the household functions, I examine effects separately for three types of doubled-up households: 1) double-ups formed with the child's grandparent(s); 2) double-ups formed with the child's adult sibling(s); and 3) double-ups formed with other adult(s), such as extended family and non-kin. Instead of examining household composition at a single point, I operationalize household composition with a duration-weighted measure of exposure to each household type throughout childhood. I estimate the effects of additional years spent in each household type using marginal structural models and inverse probability of treatment weighting. Unlike conventional regression techniques, these methods account for the fact that household composition is both a cause and consequence of other time-varying family characteristics – such as income and mother's marital status – that affect children's young adult outcomes. By identifying the long-term effects of doubling-up in childhood, this research reveals how adult household members beyond parents and their romantic partners have enduring effects on children's life chances and demonstrates the importance of expanding the study of family complexity to include household members outside the nuclear family.

Prior Research on Doubling-up

Relative to more well-studied forms of family complexity, doubling-up is a common childhood experience. More children live in extended households with a grandparent, other relative, and/or nonrelative than in either stepfamilies or cohabiting families (Kennedy and Fitch 2012). Though we know relatively little about the effects of doubling-up and how these effects vary across household type, previous research does suggest numerous mechanisms through which doubling-up may affect children. Qualitative work has highlighted the role of doubling-up as a private housing safety net (Desmond 2012; Skobba and Goetz 2013). Relative to living in a non-shared household, doubled-up individuals may benefit from higher household income (Mutchler and Baker 2009; Mykyta and Macartney 2012) and lower housing costs (Pilkauskas et al. 2014). For some families, doubling-up allows children to escape dangerous neighborhoods or attend better schools (Ahrentzen 2003; Goodman and Silverstein 2002; Rhodes and DeLuca n.d.). If doubling-up increases material well-being and improves housing, neighborhood, and school environments, it could be beneficial for children.

Yet other research suggests ways that doubled-up households may negatively affect children. Increasing household size can strain already limited resources, particularly as doubled-up adults are more likely to have poverty-level personal incomes than non-doubled-up adults (Mykyta and Macartney 2012; Rhodes and DeLuca n.d.). Doubling-up with family or friends can also expose children to overcrowded and unsafe environments (Edin and Shaefer 2015; Seefeldt and Sandstrom 2015). Finally, doubled-up households are often stressful and conflictual environments (Domínguez and Watkins 2003), and disagreement over whether and how household adults should share childrearing is common (Harvey 2015). In sum, extant research hypothesizes mechanisms through which doubling-up may both positively and negatively affect child outcomes, with little consensus about the ultimate direction of the effect.

The effects of living doubled-up likely vary based on the (non)familial relationships between household members. Most existing studies of doubling-up focus exclusively on multigenerational households. Though findings from these studies are inconsistent (see Dunifon,

Ziol-Guest, and Kopko 2014 for a review), multigenerational double-ups are often considered supportive environments, especially for young mothers. Children in multigenerational homes benefit from substantial time investments from co-residential grandparents (Kalil et al. 2014). Previous research has also found positive associations between multigenerational co-residence and mothers' productive activities, like work and school (Gordon, Chase-Lansdale, and Brooks-Gunn 2004; Hao and Brinton 1997). However, other research finds negative associations between multigenerational co-residence and parenting quality (Black and Nitz 1996; Unger and Cooley 1992), and qualitative work highlights the complexity of such households, hypothesizing that there may be a "diffusion of parenting responsibility" in multigenerational homes as both mothers and grandmothers assume the other will take on more of the childrearing responsibility (Chase-Lansdale, Brooks-Gunn, and Zamsky 1994).

In recent years, a growing number of young adults have "failed to launch" from their natal home or "boomeranged" back into it (Berlin, Furstenberg, and Waters 2010). Though common, adult children living in their parents' homes remains non-normative (Furstenberg et al. 2004; Settersten 2011), and these households are "doubled-up" according to standard definitions.[2] Adult children are the most common type of non-householder doubled-up adult (Eggers and Moumen 2013:vii; Mykyta and Macartney 2012:3), and much of the recession-time increase in doubling-up was driven by young adults living in their parents' homes (Eggers and Moumen 2013). A growing literature suggests these double-ups are consequential for both adult children and their parents, affecting mental health and well-being, family formation, and financial security (Fingerman et al. 2012; Furstenberg 2010; Maroto 2017; Tosi and Grundy 2018; White 1994). Yet, to my knowledge, no study has examined how adult sibling co-residence may affect the outcomes of minor children living with the parent(s).

Co-residence with an adult sibling may divert parental resources from minor children. In adult child double-ups, parents typically contribute most of the income and household work (White 1994), and co-resident adult children are associated with declines in parents' savings (Maroto 2017). Likewise, co-resident adult child lengthen the timeline of parenting obligations (Swartz 2009) and increase the likelihood of parents' providing adult children "intense support" (many types of support, several times a week) (Fingerman et al. 2012), which may reduce attention for minor children. Finally, because parents and adult children generally perceive such intensive parental support as aberrant (Fingerman et al. 2012), doubling-up may have psychological costs for both parties. On the other hand, co-residence with adult siblings might be expected to produce supportive childhood environments. Adult children have experience living in their natal home, and while relationships with parents and siblings shift after they enter adulthood, such households likely have more established roles and precedents for household functioning (Harvey 2018). Qualitative work shows parents and adult children often have positive feelings about young adults living in their natal home while pursuing educational or occupational goals (Newman 2012; Sassler, Ciambrone, and Benway 2008). If adult siblings do

[2] For example, one HUD analysis considers doubled-up households those with "any person who is not the householder, the householder's spouse or partner, or a child of the householder younger than age 21" (Eggers and Moumen 2013:2). Similarly, a census report defines shared households as "a household with at least one resident adult who [if under age 25] is not enrolled in school and who is neither the householder, nor the spouse or cohabiting partner of the householder" (Mykyta and Macartney 2012:1).

not increase household stress, they may not negatively affect children's environments. Moreover, supportive older siblings are associated with positive child outcomes (Prime et al. 2014), so these double-ups may be beneficial if the adult sibling is attentive to the younger child's needs.

Though most research on doubling-up focuses on intergenerational relationships, nearly 40 percent of mothers doubled-up with someone other than an adult child live in a household that does not include a parent or in-law (Pilkauskas et al. 2014). Double-ups formed with extended kin involve greater sharing of household expenses by household members than double-ups formed with parents or adult children (Reyes 2018), and may also have more disagreement over household economic arrangements (Harvey 2018). Within-household income inequality is associated with greater instability for double-ups formed with extended family or non-kin, but not double-ups formed with parents or adult children (Glick and Van Hook 2011). While we know relatively little about how double-ups formed with extended family or non-kin might affect children, these findings suggest that such households may be more transactional and involve lower levels of household solidarity, which might make them less supportive environments.

Despite these potential differences, studies of the effects of non-multigenerational double-ups generally consider extended households as a single category. While some studies categorize households based on all co-resident adults (both kin and non-kin) and others categorize based only on co-resident kin, extant research typically groups multigenerational and non-multigenerational households together (Ahrentzen 2003; Aquilino 1996; Entwisle and Alexander 1996; Kang and Cohen 2017; Park, Fertig, and Allison 2011; Thompson et al. 1992). One exception is work by Mollborn and colleagues (2011), which compares the effects of double-ups formed with children's grandparents to those formed with any other adults on cognitive scores and behavioral outcomes at age two. Their results suggest that, for most children, co-residence with grandparents is associated with better early childhood outcomes, particularly cognitive outcomes, than is co-residence with non-grandparent adults.

The research above indicates that doubled-up households vary substantially depending on the relationships between household members, suggesting the importance of considering doubling-up not just as a uniform housing arrangement, but also a social environment with effects that may differ based on household relations. In this analysis, I examine the effects of three types of doubled-up households: those formed with the child's grandparent(s); those formed with the child's adult sibling(s); and those formed with another extended family member or non-relative. These categories reflect three double-up types that prior research suggests have distinct household dynamics that may influence children's outcomes in disparate ways.

Extant research on the effects of doubled-up households, regardless of type, has generally focused on cognitive and behavioral outcomes in childhood or adolescence (Augustine and Raley 2013; Dunifon and Kowaleski-Jones 2007; Leadbeater and Bishop 1994; Mollborn et al. 2011). While the many economic and social consequences of household composition suggest that it is likely influential in shaping children's long-term outcomes, we know relatively little about how enduring the effects of doubling-up in childhood are. If the effects of doubling-up in childhood persist and shape children's life chances into adulthood, these households may play a role in the transmission of disadvantage across generations.

In this analysis, I examine young adult outcomes in two domains, education and health. As described above, doubling-up shapes children's physical environments and access to material resources, as well as social factors – including the amount of stress in the household and the amount of oversight and support the child receives – that are key to children's cognitive and socio-emotional development and physical health. As my outcomes of interest, I focus on high

school graduation and college attendance because of their role in labor market outcomes (Breen and Jonsson 2005; Jencks 1972) and depression, smoking, and obesity because of their importance for adult health.

Both educational attainment and health are influenced by household dynamics and parenting practices, which may be affected by doubling-up. Parental stress and household conflict is associated with harsh, inconsistent, and uninvolved parenting, which in turn affect children's academic abilities and propensity for emotional and behavior problems (Conger, Conger, and Martin 2010). Unresponsive parenting and exposure to household conflict are also associated with increased risk of obesity (Rhee 2008). In addition to influencing parents' behavior, doubling-up puts children in close contact with other adults. Through role-modeling (positive or negative), support, or supervision, household adults may shape children's school engagement and participation in risky behaviors like smoking, which in turn also shape academic attainment (McLanahan et al. 2013). Additionally, material deprivation and difficult home environments affect children's health directly. Childhood stress shapes development in ways that make children vulnerable to depression in young adulthood (Turner and Butler 2003). And children's weight and the establishment of good health behaviors depend on access to healthy food and safe environments that are conducive to physical activity (Kimbro, Brooks-Gunn, and McLanahan 2011; Rhee 2008). Because childhood weight tracks onto risk of obesity in adulthood (Daniels 2006), young adult obesity may be especially susceptible to cumulative effects. Previous research provides strong evidence linking father absence to worse adult mental health and increased substance use, including smoking (McLanahan et al. 2013), suggesting that household composition may be particularly relevant for these outcomes. In this study, I extend this literature to consider how the presence of adults beyond parents and their romantic partners influence these outcomes.

Dynamic Selection into Household Types

As discussed, the instability of doubled-up households makes it important to study household composition longitudinally. Studies that use short-term measures of household composition have two primary limitations. First, static measures compare children who were doubled-up during the survey, many of whom will soon transition out of such households, to all children who were not doubled-up during the survey, though many of these children live doubled-up at some point during childhood. Thus, these studies likely underestimate the impact of doubling-up on children's outcomes. Moreover, studies that use static measures estimate effects for children who were doubled-up for a short duration along with children who were doubled-up for a long period. The mechanisms through which household composition may affect children – such as changes in material well-being and availability of caregivers – likely have larger impacts over time, suggesting that measuring duration in different household types is key to understanding their cumulative effects.

While there are clear reasons to prefer a longitudinal perspective of household composition, this approach poses methodological challenges. As highlighted by life course theory, early life circumstances, such as household composition, have direct effects on children, but also influence the life course by shaping children's subsequent environments (Elder 1998). Thus, understanding the full effects of household composition requires capturing both its direct and indirect effects. Yet, if time-varying characteristics both predict and are predicted by the independent variable – household composition in this case – conventional static models provide biased estimates of the total effects of that variable. Research on doubling-up suggests that selection into household types is affected by many of the same factors that mediate the

relationship between household composition and children's outcomes. For example, individuals who become unemployed are more likely to double-up (Wiemers 2014), and having an unemployed parent also affects children's outcomes, so controlling for maternal employment status is necessary to prevent omitted variable bias when estimating the effect of doubling-up throughout childhood on young adult outcomes. However, doubling-up increases mothers' likelihood of entering the workforce (Hao and Brinton 1997). Given that one pathway through which doubling-up may affect children is a change in maternal work status, controlling for mother's employment throughout childhood would "control away" this pathway and produce an inaccurate portrayal of the total effect of doubling-up. Conversely, controlling only for maternal employment before the child was born would allow a model to capture indirect effects of doubling-up. However, because such a model would fail to acknowledge that maternal employment may change in ways not caused by household structure, and household structure may then respond to those changes, this model would also produce biased estimates.

Given these issues, I use marginal structural models and inverse probability of treatment weighting (IPTW) (Robins, Hernán, and Brumback 2000) to estimate the effects of time spent in different household types. IPTW addresses the problem of time-varying confounders by weighting each individual by the inverse of the predicted probability that the individual would be in the series of household structures in which she was observed. IPTW does not solve any issues due to unmeasured covariates that should be included in the model, so accurately modeling selection into doubled-up households is important, as it would be with conventional regression methods. However, unlike conventional regression methods, IPTW provides unbiased estimates of the total effects of household type over childhood if selection into doubled-up households is correctly modelled. Conventional regression methods, in contrast, require the additional assumption that household composition does not affect future values of time-varying confounders.

Data

I employ data from the National Longitudinal Study of Youth 1979 (NLSY79) and Child and Young Adult supplements (NLSY79-CYA). The NLSY surveyed over 12,600 Americans, with an oversample of Hispanic and African American respondents, to create a nationally-representative sample of men and women ages 14 to 21 at the start of 1979. The NLSY79-CYA includes all children born to NLSY79 mothers, and this sample is representative of approximately 95 percent of all the children ever born to this cohort of women (Bureau of Labor Statistics n.d.). In 2012, the young adult response rate was over 80 percent (National Longitudinal Surveys n.d.). The NLSY is one of few surveys to follow children from birth through young adulthood, and the extensive covariates available from the maternal and child interviews make these data ideal for this analysis.

To study household structure throughout childhood and outcomes at age 20, I restrict my sample to children born between 1979 and 1995, about 80 percent of the original sample. Roughly half of the omitted births occurred prior to 1979 (to mothers age 20 and younger) and half occurred after 1995 (to mothers age 30 and over). Of the children in my sample, 2,576 were lost to follow-up at some point during childhood, and an additional 364 are missing measures on at least one outcome of interest, bringing the final sample size to 6,315. Following Wodtke, Harding, and Elwert (2011), I construct weights to address potential non-random attrition from the sample. The NLSY79 was fielded annually from 1979 to 1994 and biennially since 1994. For years in which there was no survey, I use values from the previous year. For all other missing data, I use multiple imputation.

My treatment variable, created from maternal household roster data, is a duration-weighted measure of exposure to different household types from age 1 to 17. Because I do not have the covariate and treatment information needed to model selection into households at birth, household type at birth it is incorporated into my prediction models as a baseline confounder and is not used to estimate the effects of household type on child outcomes (Wodtke et al. 2011). My results estimate the effect of an additional year spent in each household type from ages 1 to 17.

I consider a household doubled-up if it contains at least one adult age 21 or over other than the mother and mother's romantic partner (Eggers and Moumen 2013).[3] I classify households into five types, depending on whether the child is living: 1) with mother in non-doubled-up household; 2) with mother in double-up formed with the child's grandparent(s); 3) with mother in double-up formed with the child's adult sibling(s); 4) with mother in double-up formed with another adult(s), which I call extended kin/non-kin households,[4] or 5) in any household without the mother. In all models, if a household has multiple additional adults, I assign children to the first extended household type listed above for which they are eligible. For example, if a mother co-resides with two additional adults, her mother and adult sister, I consider the household a multigenerational double-up. The ordering of doubled-up household types is intended to reflect the additional adult I expect to be most involved in the child's life.[5] Separating extended kin double-ups from non-kin double-ups did not reveal systematic differences between these groups.[6] Finally, while I include an indicator for how many years the child spent in a household without her mother, this estimate is not a focus of this research. I include this household type to retain in my sample children who spend some, but not all, of childhood in a household without their mother, such as while living with their father or other relatives, away at school, or on their own. However, because the data for this analysis are primarily drawn from surveys with mothers, they are poorly-suited for studying the effects of non-maternal households, and I do not discuss results for this group.

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[3] While some studies count all adults age 18 and over as additional adults (Mollborn, Fomby, and Dennis 2011; Mykyta and Macartney 2012), this definition results in a high prevalence of adult sibling double-ups because it is common for adult children to remain in the natal household at age 18. Using age 24 as a cut-off produces broadly similar results.

[4] Of extended kin/non-kin double-ups, about 13 percent were formed with a male non-relative. Because of the possibility that some of these reported double-ups might actually have been cohabiting romantic partner households, I re-ran the analysis categorizing all double-ups identified because of the presence of male non-relatives as non-doubled-up households. The results are very similar with this specification of doubled-up households.

[5] Because fewer than 5 percent of adult sibling double-ups also contain an extended family/non-kin household member, altering the ordering for these household types produces minimal changes. Because over one-third of multigenerational households include an extended family/non-kin household member as well, I also analyzed these households as a separate category. I find that the effects of these households tend to fall between the estimates for multigenerational-only and extended kin/non-kin household types.

[6] Separating extended kin double-ups from non-kin double-ups produced weights with very high variance, likely due to the small number of non-kin double-ups. The high variance required that I top- and bottom-code the weights at the 5^{th}/95^{th} percentile for the supplemental analysis, though it increases bias in the estimates. Moreover, if the high variance reflects a near-zero probability of being in a non-kin double-up for certain groups, it may also bias the estimates (Petersen et al. 2012). These data limitations prevent me from making definitive claims about the similarities or differences between extended kin and non-kin double-ups, and future research should explore this question.

My outcome variables measure young adult educational attainment and health. I measure whether the child, at age 20: 1) has graduated high school; 2) has ever attended college; 3) has smoked in the past month; 4) has symptoms of depression, measured by a score of 8 or above on the CES-D-SF (CESD-R n.d.; Levine 2013); and 5) is obese, measured by a self-reported height and weight corresponding to a BMI greater than 30. If data at age 20 was unavailable, I accept a measure from age 19, 21, or 22. Because depressive symptom data are only available in 2000 and 2002 for individuals not interviewed in the previous survey round, I also accept measures from ages 18 and 23 for children born in 1979 or 1980.

Predictors

To estimate the IPTWs, I predict household type from a multinomial logistic regression model. Previous research has established the importance of demographics, economic factors, and childcare needs in mothers' likelihood of living doubled-up (Pilkauskas 2012; Sigle-Rushton and McLanahan 2002). Table 1 provides a summary of included covariates.

Demographic Factors

To capture demographic factors that may prompt doubling-up, I include child's race (Hispanic, non-Hispanic black, and non-black, non-Hispanic, which I refer to as white)[7] and an indicator for whether the mother was born in the U.S. I also include the sex and birth year of the focal child. Time-varying indicators measure whether the family lives in an urban area and the region of residence (south, north central, west, or northeast). As measures of mothers' social origins, I include indicators for the highest reported educational attainment of her parents (less than high school, high school, some college, or 4+ years of college).

Economic Need

To reflect economic need, I include measures of total income of the mother and, if married, her spouse from wages and salary, business or farm income, and/or military income in the previous calendar year (in $10,000s). This measure is adjusted to 2014 dollars and top-coded at the 95th percentile. Additionally, I include an indicator for whether the mother received any welfare, including cash assistance (AFDC/TANF), food stamps, and/or SSI, in the past calendar year and, if so, a measure of her total welfare income (in $10,000s), adjusted to 2014 dollars and top-coded at the 95th percentile. Because doubling-up can be a response to unemployment, I include an indicator for whether the mother reported that either she or her spouse received unemployment income or that she was unemployed at some point during the current calendar year.[8] To further capture the mother's earning potential, I include time-varying indicators for her educational attainment (less than high school, high school, some college, or 4+ years of college), as well as her 1979 Armed Forces Qualifying Test score percentile, a measure of cognitive achievement.

Because members of the armed forces may receive housing benefits, I include an indicator of whether the mother or, if married, her spouse received any income from military service in the past year. Similarly, I include a measure of whether she and her family ever lived

[7] Though previous work suggests the effects of doubling-up may differ by race (Foster and Kalil 2007; Mollborn et al. 2011), separate models by race did not reveal systematic differences between groups.

[8] I use unemployment data from the current calendar year, despite being unable to distinguish whether the unemployment episode occurred before or after the double-up, because I expect the effects of unemployment on doubling-up to occur relatively quickly and assume it is less common that doubling-up would cause unemployment.

in public housing or received a government rent subsidy in the past year and whether she or her spouse owns or is currently buying their home. These variables capture the availability of housing options. Additionally, public/subsidized housing, military housing, and renters' landlords may all impose rules about occupancy and extended stays by guests, making it less likely that a family will double-up. Finally, to capture overall residential instability that may be predictive of temporary housing arrangements, I include a variable for the total number of previous residential moves.

Childcare Needs

Mothers with greater childcare needs may be more likely to double-up. To capture factors which could limit a mother's ability to care for her child, I include measures of mother's age at the birth of the child and the last observation of her Rosenberg self-esteem score before the child was born. As measures of child and maternal health, I include a time-invariant indicator for whether the child or a sibling was low birthweight and a time-varying measure of whether health limits the mother's ability to work. An indicator for whether the mother reports having used cocaine or crack cocaine ten or more times in her lifetime serves as a rough measure of drug use. I also include a measure of whether the mother reported drinking six or more drinks on a single occasion in the past month. Because the data on self-esteem, drug use, and binge drinking were gathered too inconsistently to be included as time-varying covariates, I used the last observed value before the birth of the child. To account for demands for the mother's time, which may affect her need for childcare assistance, I include time-varying indicators of her employment status in the past calendar year (full-time, part-time, or not employed) and whether she was enrolled in school.

A mother's childcare needs are also influenced by the age and number of children for whom she is responsible. I include time-varying measures of how many biological, adopted, or step-children the mother has in the household, as well as the age of her youngest child. Because romantic relationship status and changes can influence a mother's need for childrearing assistance, I include time-varying indicators for whether the mother is currently married, previously married (including divorced, separated, or widowed), or never married.[9] For currently unmarried mothers, I also include an indicator for the presence of a cohabiting partner. I measure changes in the mother's relationship status with two indicators for whether she gained or lost, respectively, a spouse or cohabiting partner between the previous and current survey wave. To account for household instability, I include a variable for the total number of previous transitions between household types. This measure excludes transitions into adult sibling double-ups that are the result of the sibling aging, rather than newly joining the household.

Inverse Probability Treatment Weights

Following previous research (Sharkey and Elwert 2011; Wodtke et al. 2011), I use stabilized IPTWs, which have desirable properties over non-stabilized weights, including smaller

[9] Because I am interested in the effects of extended household members beyond parents' romantic partners, I include mother's romantic relationship status as covariates in my prediction equations. However, to explore whether the effect of doubled-up household types vary by mother's relationship status, I stratify the sample by marital status at child's birth. The results produce few significant differences between married and unmarried mothers, but do suggest that extended kin/non-kin households may be more detrimental for children born to unmarried mothers than children born to married mothers.

variance (Robins et al. 2000). The use of stabilized weights also reduces the magnitude of potential bias that could occur if certain subgroups of the sample rarely receive the treatment (i.e., doubling-up) (Cole and Hernán 2008). To construct the weights, I predict the child's household type using multinomial logit models. For each child (*i*), the probability of treatment is the product of the year-specific probabilities of being in the household type in which the child was actually observed from ages 1 to 17. The year-specific (*k*) predicted probabilities of an individual being in the household structure in which she was observed (A_{ik}) are based on household structure ($A_{i(k-1)}$) and time-varying covariates ($\bar{L}_{(k-1)}$) measured in the previous year, as well as time-invariant covariates and baseline values of time-varying covariates ($\bar{L}_0$). This product is the denominator of the stabilized weight. The numerator follows the same form, but excludes time-varying predictors.

$$SW_i = \frac{\prod_{k=1}^{17} P[A_k = a_{ki}] | A_{(k-1)} = a_{(k-1)i}, \bar{L}_0 = l_0}{\prod_{k=1}^{17} P[A_k = a_{ki}] | A_{(k-1)} = a_{(k-1)i}, \bar{L}_{(k-1)} = l_{(k-1)i}, \bar{L}_0 = l_0}$$

Following convention, I construct attrition weights to address the possibility that attrition from the sample before young adulthood is non-random (Lee and McLanahan 2015; Wodtke et al. 2011). These weights follow the same form as the stabilized IPT weights described above, but they adjust for children's probability of remaining in the sample through age 19. In this case, the denominator is the product of the probabilities of the child remaining in the sample in each year, conditional on the child being observed in the previous year, her time-invariant and baseline characteristics, and time-varying characteristics and household composition observed in the previous year. The numerator is similar, but excludes time-varying covariates. I multiply the IPT weights by the attrition weights to produce the final weights used in the outcome models.[10] To reduce the variance of the weights and lessen the influence of the highly-weighted observations, I top- and bottom-code the weights at the 1st and 99th percentile (Cole and Hernán 2008). This results in a final weight with a mean of 1.06 and standard deviation of 1.40.

Marginal Structural Model using IPTW

I estimate a series of logit models in which each outcome – high school graduation, college attendance, smoking, depression, and obesity – is a function of duration-weighted exposure to each household type from ages 1 through 17. In the equation below, the log odds ratios δ_1 through δ_4 are the estimated impact of spending one additional childhood year in a given household type (multigenerational double-up, adult sibling double-up, extended kin/non-kin double-up, or without mother) on the log odds of experiencing the outcome.

$$logit_{IPT-weighted}\big(P(Y_i = 1)\big) = \theta_0 + \delta_1 \sum_{k=1}^{17} a_{1ik} + \delta_2 \sum_{k=1}^{17} a_{2ik} + \delta_3 \sum_{k=1}^{17} a_{3ik} + \delta_4 \sum_{k=1}^{17} a_{4ik} + \gamma_2 \bar{L}_{i0}$$

[10] Following convention for studies using IPTW, I present results of the outcome models weighted by the product of the attrition and IPT weights. When I weight the outcomes models by the product of the IPT weights and the NLSY79-CYA longitudinal weights, which adjust for both attrition and survey design, the results are very similar, though the coefficient on multigenerational households for smoking is slightly larger in magnitude and statistically significant in the NLSY79-CYA-weighted analysis [b=-0.05, CI=(-0.09 , -0.00)].

Using the stabilized IPTWs requires that the model condition on time-invariant and baseline covariates, $\overline{L}_{i0}$, in order for doubling-up to be unconfounded with these background traits (Wodtke et al. 2011). For both the prediction models and marginal structural models, I cluster standard errors at the mother level to account for non-independence of observations from siblings.

Results

Prevalence and Instability of Doubled-up Households

Table 2 reports the proportion of children who experienced each doubled-up household type, weighted to be representative of children born to the NLSY79 cohort of mothers. These results show that living in a doubled-up household is a common childhood experience: 45.1 percent of children experience a double-up at some point from ages 1 through 17.[11] The cumulative prevalence of doubling-up underscores the importance of longitudinal measures of household composition. Though nearly half of children double-up at some point, a relatively small proportion (0.10) of all childhood years from ages 1 to 17 are spent doubled-up, suggesting that a single point-in-time measure would miss many previous and future double-ups.

Multigenerational households are the most common type of doubled-up household, with over one-fifth of children experiencing this household type between ages 1 and 17. However, adult sibling and extended family/non-kin double-ups are not uncommon. Approximately 19 percent of children lived in a household with an adult sibling and 15 percent in a household with extended family/non-kin. Many children live in multiple double-up types over childhood, and there is substantial overlap in the children who experience multigenerational and extended kin/non-kin households. Over 40 percent of children who ever live in an extended kin/non-kin household also experience a multigenerational household, a rate nearly twice that of children who never live in an extended kin/non-kin household.

Table 3 shows the average number of years spent in each doubled-up household type, from ages 1 through 17, for children who ever experienced the household type. On average, children who double-up spend a total of 3.9 years in these households.[12] Children who double-up in extended kin/non-kin households at some point between ages 1 and 17 spend an average of 2.4 years in this household type. Similarly, children who live in an adult sibling double-up spend an average of 2.2 years in such households. Children tend to spend more years in multigenerational households than in other types of double-ups. Children who live in a multigenerational household spend an average of 4.2 childhood years in these households.

These averages conceal considerable variation in the amount of time children spend in each household type, especially for multigenerational homes. While nearly 30 percent of children who live in multigenerational households spend a year or less in these households, over one-

[11] Because mothers are most likely to double-up when their child is younger (Pilkauskas, Garfinkel, and McLanahan 2014), these numbers are smaller than they would be if they included mothers who doubled-up in the year of their child's birth.

[12] Glick and Van Hook's (2011) analysis of the Survey of Income and Program Participation, which interviews households every four months, finds that most doubled-up households dissolve in less than one year, suggesting that the annual/biennial structure of the NLSY79 likely misses a substantial number of double-ups of shorter duration. By excluding these shorter-duration double-ups, I may underestimate the average total childhood years spent in each household type. On the other hand, by assuming that each observed spell lasts at least a full year, I may be overestimating the average total childhood years spent in each household type.

fourth spend six or more childhood years in these households. Adult sibling and extended family/non-kin households are more consistently short-lived: over forty percent of children who experience these household types live in such households for a year or less. However, for both adult sibling and extended kin/non-kin double-ups, over a fourth of the children who experience these respective household types live in these households for a total of three or more years. The variation in number of childhood years spent doubled-up further demonstrates the importance of longitudinal measures of household composition.

Given the high instability of doubled-up households, childhood years spent doubled-up are not necessarily consecutive. Most children who experience an adult sibling double-up have no (24.7%), one (21%), or two (24.3%) household type transitions during childhood (excluding transitions caused by co-resident siblings aging into adulthood), but children who experience multigenerational and extended family/non-kin double-ups are more likely to cycle in and out of different household types. Nearly 20 percent of children who ever live in multigenerational households and approximately 25 percent of children who ever live in extended family/non-kin households experience five or more transitions between household types during childhood.

Household Type Prediction Model

Table 4 presents results from a multinomial logit model predicting residence in each household type, with living in a non-doubled-up household with a mother as the reference category.[13] This prediction model provides insight into the characteristics at time *k-1* associated with residence in each household type at time *k*. Unsurprisingly, previous household type is a strong predictor of current household type. Living in any doubled-up household in one wave is significantly associated with living doubled-up in the same household type in the following wave, relative to living in a non-doubled-up household. Moreover, residence in any doubled-up household type is associated with heightened risk of being doubled-up in another doubled-up household type in the following wave, relative to being non-doubled-up. This association is statistically significant for all household types, though it is strongest for multigenerational and extended kin/non-kin households.

Mothers with higher income and greater housing options are less likely to double-up. Income from earnings is negatively associated with subsequent residence in all types of doubled-up households, though the association is statistically significant only for extended family/non-kin households. Similarly, for those children whose mothers receive welfare income, the amount received is significantly negatively associated with residence in an adult sibling double-up. Living in subsidized housing is significantly negatively associated with living in a multigenerational or extended family/non-kin household in the subsequent wave, and homeownership is negatively associated with living in a multigenerational home. Additionally, race remains significantly associated with doubling-up, even controlling for socio-economic factors. Compared to being white, being black increases the odds of living in an adult sibling double-up relative to living non-doubled-up, and being Hispanic increases the odds of living in any type of doubled-up household relative to living non-doubled-up.

Relative to being never married, being married lowers the odds of living doubled-up in multigenerational and extended kin/non-kin households relative to living non-doubled-up.

[13] For ease of interpretation, I exclude baseline measures of the time-varying covariates in this model, though they are included in the IPTW prediction model.

Cohabiting is also associated with lower odds of living in multigenerational and extended kin/non-kin households. Additionally, family structure changes predict household type. Having a mother marry or begin to cohabit is associated with substantially reduced odds of living in a multigenerational or extended family/non-kin household compared to not living doubled-up, while having a mother end a marital or cohabiting relationship is associated with higher odds of living in a multigenerational or extended family/non-kin household relative to not being double-up. Household instability driven by non-romantic partners is also predictive: the number of previous transitions between household types is positively associated with residence in extended kin/non-kin households relative to non-doubled-up households.

Effects of Doubling-up on Young Adult Outcomes

Table 5 presents the results of the IPT-weighted outcomes models in the right-hand columns. For comparison, the left-hand columns of table 5 list the coefficients and confidence intervals for outcome models that are weighted only by the attrition weights and do not account for selection into doubled-up households.

Extended Kin/Non-kin Households

The unadjusted models show negative associations between childhood years spent in extended kin/non-kin households and educational attainment and positive associations with adverse young adult health outcomes. For all outcomes except obesity, these associations are statistically significant. While accounting for selection into extended kin/non-kin households attenuates most of these associations, the coefficients for high school graduation, college attendance, and obesity are statistically significant in the IPT-weighted models. In the IPT-weighted model, an additional year in an extended kin/non-kin household is associated with nine percent lower odds of high school graduation and eight percent lower odds of college attendance. An additional year in an extended kin/non-kin household is associated with 11 percent higher odds of obesity. While the coefficients for depression and smoking[14] fall from statistical significance in the IPT-weighted model, they remain positive. Overall, the results suggest that years spent in extended kin/non-kin households have negative effects on children's young adult well-being, even after accounting for selection into these households.

Adult Sibling Households

In the unadjusted model, childhood years spent in adult sibling households are significantly negatively associated with both high school graduation, college attendance, and smoking and significantly positively associated with smoking. Accounting for selection into these households changes these associations substantially. In total, four of the five coefficients from the IPT-weighted models suggest positive effects of adult sibling households, and I find no significant negative effects of these households. Years spent in adult sibling double-ups are positively associated with high school graduation and college attendance and negatively associated with depression, though none of these associations are statistically significance. The coefficient for obesity is positive, but insignificant. Only the negative coefficient for smoking

[14] In these results, I consider a young adult a smoker if she reports smoking at least monthly. Using an indicator for whether the young adult reported smoking daily results in nearly identical results, but the confidence interval for adult sibling households is wider [b=-0.13; CI=(-0.26 , 0.00)] and the coefficient for multigenerational households drops to zero [b=0.00; CI=(-0.05 , 0.04)].

reaches statistical significance. In the IPT-weighted model, an additional year in an adult sibling household is associated with 13 percent lower odds of smoking.

Multigenerational Households

The unadjusted models show significant negative associations between childhood years spent in multigenerational households and educational attainment. However, adjusting for selection attenuates these associations substantially, and the coefficients from the IPT-weighted models are near zero and not statistically significant. Both the unadjusted and the IPT-weighted models show relatively little association between multigenerational households and young adult health outcomes. Only the positive coefficient for obesity is significant in the unadjusted models, but the estimate is smaller and statistically insignificant in the IPT-weighted model. Together, these results suggest that after accounting for selection into these households, childhood years spent in multigenerational double-ups have little effect on young adult educational attainment or health.

Limitations and Directions for Future Research

This analysis remains subject to several important limitations. While the NLSY79 provides an extensive list of covariates I incorporate into my models predicting household type, it does not contain data on all relevant characteristics. Because maternal depression might lead a mother to seek co-residential support, I would like to account for this concept in the prediction model, but a direct measure of maternal depression is only available for 1992 and 1994, so I do not include it in my analysis. However, self-esteem, which is measured at baseline, is associated with depression (Baumeister et al. 2003), and depression should also be partially captured by the time-varying indicator of whether health limits the type or amount of work the mother can do. The differences between the coefficients in the unadjusted and IPT-weighted models – particularly the substantial changes between the unadjusted and adjusted models for educational attainment – provides evidence that the IPT weights are accounting for selection into doubled-up household types, but omitted variables continue to be a consideration in this analysis.

Additionally, the NLSY79 does not specify which adult in a doubled-up household is the householder. Previous research provides some insight into this question; when adults live with their parents, the older generation tends to be the householder, suggesting that the mother is generally the householder in adult sibling double-ups, and the grandparent is generally the householder in multigenerational double-ups (Cohen and Casper 2002; Maroto 2017; White 1994). Whether a mother hosts another adult in her home or lives in someone else's home may shape how the household is experienced by the child, so examining how the effects of doubled-up household types may differ by mother's householder status is an important question for future research.

Data limitations present another challenge for this analysis. Though often conceptualized as a single household type, doubled-up households represent a diverse group. This study improves upon prior research by examining differences between three different types of doubled-up households based on the (non)familial relationships of household members, but there are many theoretically-relevant ways to categorize doubled-up households, and subgroup sample size presents a challenge to differentiating between doubled-up households along all the potential dimensions. For example, insufficient sample size prevents me from being able to categorize household types by both the presence of mothers' romantic partners and other household adults. My robustness checks shed some light on the impacts of using an older age cut-off for adult sibling double-ups, including double-ups formed with the child's grandparent(s) *and* another non-sibling adult as a unique category, and stratifying by mother's marital status. However, the

relatively large confidence intervals in these analyses limit my ability to draw strong conclusions, and questions remain about the ways in which doubled-up household types differ and the dimensions along which they should be categorized.

Data limitations shaped other decisions as well. In this study, the model predicting subsequent household type adjusts for the child's previous household type, but assumes that the association between each of the other predictor variables and subsequent household type is constant regardless of the child's household type in the previous wave. It would be preferable to predict the likelihood that the child is in each household type in the next year separately for each household type, but data limitations prevent me from modeling these groups separately. Similarly, while I explored differences by race, I found no clear patterns, likely due to sample size. Future analyses should continue examining how families select into and out of doubled-up households and how selection processes and effects of doubled-up household types differ by race and nativity (cf. Kang and Cohen 2017; Mollborn et al. 2011).

As described, the instability of doubled-up households makes studying these households from a dynamic perspective vital. Household instability likely shapes the effects of residence in different type of doubled-up households. Recent studies have focused on the effects of not just family structure, but also family instability (Cavanagh and Huston 2006; Fomby and Cherlin 2007), and new research demonstrates that transitions by extended family and non-kin in and out of the household also affect children's outcomes (Perkins 2017). In this analysis, I include previous transitions between household types as a predictor of subsequent household type, but do not estimate the relative effects of household structure and household transitions. Disentangling the independent effects of each of these factors is another important challenge for future research.

Conclusion

Prior studies of children's household composition has focused primarily on estimating the relationship between doubling-up, often measured at a single point in time, and childhood outcomes. This study extends this line of research by examining the cumulative effects of doubling-up throughout childhood and showing that childhood household structure can have enduring impacts on young adult well-being. To examine the long-term effects of doubling-up, I draw on longitudinal data that include household trajectories throughout childhood. The results demonstrate the importance of a longitudinal approach: though just ten percent of childhood years from ages 1 to 17 are spent doubled-up, a much larger percentage of children – 45 percent – double-up at some point during childhood. By accounting for household compositions throughout childhood, rather than at a single point in time, this study reflects an understanding that households are dynamic and children's lives are shaped by the sum of their childhood environments.

I use inverse probability of treatment weighting and marginal structural models to estimate the cumulative impact of years spent in doubled-up households. By employing methods that capture both direct and mediated effects, this study takes seriously the life course theory premise that early environments affect later outcomes both directly and indirectly through their effects on later environments (Elder 1998). Yet unlike other methods that capture full effects, IPTW and marginal structural models also account for dynamic selection into doubled-up household types, allowing for the possibility that the same characteristics that predict household composition are also affected by household composition. I find that selection accounts for the associations between multigenerational and adult sibling households and worse young adult outcomes. However, extended kin/non-kin double-ups' negative associations with educational

attainment and positive association with obesity are significant after adjusting for selection into these households. These results underscore the importance of rigorous methods for distinguishing between selection and causal effects while still capturing both the direct and indirect impacts of early environments.

Though qualitative work suggests that different types of doubled-up households vary substantially in the environments they create for children, quantitative research has tended to group all doubled-up household types together or examine only multigenerational households. In this study, I estimate the impact of three main doubled-up household types – those formed with children's grandparents, with adult siblings, and with other extended family or non-kin. I find that the impacts of doubling-up vary by the relationship between household members. Particularly, the results suggest that childhood years spent doubled-up in a multigenerational home have little impact on young adult outcomes, but that years spent in extended family and non-kin double-ups are detrimental and years spent in adult sibling double-ups may be beneficial for young adult outcomes. I find that doubling-up with extended family or non-kin is associated with lower educational attainment and higher odds of obesity, and doubling-up with an adult sibling is associated with lower odds of smoking. These differing effects indicate the need for a relational understanding of doubled-up households, reflecting that such households are not merely alternative housing arrangements, but also heterogeneous social environments for developing children.

Given evidence of a link between doubling-up and children's long-term outcomes, future research should investigate potential mechanisms. I find strong evidence of the effects of extended kin/non-kin households on educational attainment and obesity, but less clear evidence linking these households to depression or smoking. This finding is interesting in light of the literature on family structure; studies on father absence consistently find negative effects for adult mental health and substance use, including smoking, but there is little evidence of effects on cognitive development (McLanahan et al. 2013). These divergent results may reflect differences in how or the degree to which family structure and household composition affect children, underscoring the need for future research that examines household composition in concert with family structure.

These findings have implications for our conceptualization of family complexity. That co-residence with adults other than parents and parents' romantic partners influences children's long-term outcomes suggests that the tendency to focus exclusively on the nuclear family – defined by parents, romantic partners, and their minor children – is too limited. For children living with at least one parent, co-residence with grandparents, extended family, and non-kin is more common than residence in either cohabiting or stepfamily households (Kennedy and Fitch 2012), and I find that some doubled-up household types have lasting effects on children's life chances.

Variation in the estimated effects of doubling-up by household type and outcome suggests potential mechanisms that future research should explore. First, extended kin/non-kin households were the only double-up type with consistently negative estimated effects. These findings could reflect a lower average level of investment in children's well-being by extended family and non-kin, compared to grandparents and adult siblings, suggesting the potential importance of close familial relationships. Given the study's limitations in distinguishing between double-ups formed with extended family and non-kin, future research should work to further identify the role of (non)familial ties in shaping doubled-up households' effects on children. Additionally, my results also show a significant negative association between years

spent in adult sibling households and smoking, but no other significant associations between these households and other young adult outcomes. It is possible that co-residence with adult siblings is most beneficial in reducing risky behavior, perhaps by increasing the oversight and positive role-modelling children receive. Together, the findings lend support to differences in household functioning observed in the qualitative literature on doubled-up households, which suggests that double-ups formed by co-residence with an adult child may be relatively peaceful, while extended kin/non-kin households are often highly conflictual (Harvey 2018, 2015; Newman 2012). The differential effects of double-ups formed with grandparents, adult siblings, and extended family and non-kin provides evidence against conceptualizing doubled-up households as a uniform category, and future research should continue disentangling how co-residence with different adults shapes children's lives.

Regardless of the mechanisms at work, the negative effects of extended family/non-kin households identified in this study are troubling given large recent increases in multiple family households. The number of households with unrelated subfamilies experienced sharp growth during the Great Recession, more than tripling between 2003 and 2009 (Eggers and Moumen 2013). These findings raise concerns about how this increasingly common household type is influencing children's lives. However, young adults living in their natal home remain the most common type of doubled-up household member (Eggers and Moumen 2013). My findings suggest that adult children living with their parents do not tend to create harmful childhood environments for their younger siblings. While more research is needed on how children experience co-residence with adult siblings, the results of this study are reassuring given the increasingly extended transition to adulthood.

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Table 1: Summary of Covariates

Demographic	
Time Invariant	***Time Varying***
Born in US	Urban residence
Child's race	Region of residence
Child's sex	Child's age
Child's year of birth	
Parents' education level	
Economic Need/Potential	
Time Invariant	***Time Varying***
AFQT percentile	Earnings
	Received welfare income
	Welfare income amount
	Unemployed
	Education level
	Military service
	Public housing
	Homeowner
	Residential moves
Childcare Needs	
Time Invariant	***Time Varying***
Age at birth of child	Health limits work
Self-esteem score	Employment status
Child or sibling was low birth weight	Enrolled in school
Drug use	Number of children
Binge drinking	Age of youngest child
	Marital status
	Cohabiting status
	Gained spouse/cohabiting partner
	Lost spouse/cohabiting partner
	Household changes

Table 2: Proportion of Children Who Ever Experienced Household Type, Age 1 to 17

Household Type	proportion
Any double up	0.451
Extended kin/non-kin	0.153
Adult sibling	0.187
Multigenerational	0.232
Observations	6315

Sample weighted using NLSY79-CYA longitudinal weights.

Table 3: Years Spent in Household Type, Children who Ever Experience Household Type

Household Type	Mean	25^{th} percentile	Median	75^{th} percentile
Any double up	3.894	1.000	3.000	5.000
Extended kin/non-kin	2.433	1.000	2.000	3.000
Adult sibling	2.164	1.000	2.000	3.000
Multigenerational	4.249	1.000	3.000	6.000

Sample weighted using NLSY79-CYA longitudinal weights.

Table 4: Prediction Model for Household Type

	Multigenerational		Adult Sibling		Extended Kin/Non-kin	
	b	ci95	b	ci95	b	ci95
Time Varying						
Previous household:						
Multigenerational	4.87***	(4.69 , 5.05)	0.54**	(0.16 , 0.93)	1.89***	(1.67 , 2.11)
Adult sibling	0.74**	(0.23 , 1.25)	3.81***	(3.66 , 3.96)	1.34***	(0.87 , 1.81)
Extended kin/non-kin	1.92***	(1.69 , 2.16)	0.83***	(0.35 , 1.31)	4.18***	(3.97 , 4.39)
Not with mother	2.39***	(2.12 , 2.67)	0.96**	(0.34 , 1.58)	1.32***	(0.90 , 1.73)
Urban residence	0.08	(-0.09 , 0.24)	0.00	(-0.14 , 0.15)	0.20*	(0.00 , 0.40)
Region:						
South	0.21*	(0.02 , 0.41)	-0.17	(-0.36 , 0.02)	0.10	(-0.14 , 0.35)
West	0.17	(-0.05 , 0.38)	-0.10	(-0.32 , 0.12)	0.15	(-0.10 , 0.39)
North Central	-0.08	(-0.31 , 0.14)	-0.30**	(-0.52 , -0.09)	0.03	(-0.24 , 0.29)
Child's age	0.00	(-0.01 , 0.02)	0.05***	(0.03 , 0.07)	-0.05***	(-0.07 , -0.02)
Earnings	-0.02	(-0.04 , 0.01)	-0.01	(-0.03 , 0.01)	-0.05***	(-0.08 , -0.03)
Received welfare	-0.11	(-0.28 , 0.07)	0.08	(-0.18 , 0.34)	-0.12	(-0.34 , 0.11)
Welfare income	-0.14	(-0.30 , 0.01)	-0.35**	(-0.56 , -0.14)	0.01	(-0.18 , 0.19)
Unemployed	0.08	(-0.03 , 0.20)	0.06	(-0.10 , 0.23)	0.11	(-0.04 , 0.26)
Education level:						
Less than HS	0.09	(-0.24 , 0.41)	0.71***	(0.40 , 1.01)	-0.24	(-0.66 , 0.19)
Some college	0.01	(-0.27 , 0.29)	0.26*	(0.02 , 0.50)	-0.45*	(-0.81 , -0.09)
High school	0.04	(-0.24 , 0.31)	0.55***	(0.31 , 0.79)	-0.38*	(-0.74 , -0.01)
Military service	0.09	(-0.20 , 0.38)	0.03	(-0.27 , 0.33)	-0.26	(-0.60 , 0.08)
Public housing	-0.33***	(-0.50 , -0.16)	-0.13	(-0.37 , 0.11)	-0.31**	(-0.53 , -0.10)
Homeowner	-0.38***	(-0.53 , -0.22)	0.01	(-0.15 , 0.18)	-0.01	(-0.18 , 0.17)
Residential moves	-0.05	(-0.09 , 0.00)	-0.05*	(-0.09 , -0.01)	-0.01	(-0.07 , 0.04)
Health limits work	-0.14	(-0.31 , 0.04)	0.17	(-0.03 , 0.36)	-0.04	(-0.27 , 0.19)
Employment status:						
Not working	0.05	(-0.10 , 0.19)	-0.29***	(-0.45 , -0.12)	-0.11	(-0.29 , 0.08)
Part time	-0.18	(-0.37 , 0.01)	-0.09	(-0.27 , 0.09)	-0.31**	(-0.55 , -0.08)
In school	0.11	(-0.04 , 0.25)	-0.00	(-0.22 , 0.21)	-0.18	(-0.40 , 0.03)

Number of children	-0.09*	(-0.16 , -0.02)	0.36***	(0.30 , 0.41)	-0.04	(-0.11 , 0.03)
Age of youngest child	-0.01	(-0.03 , 0.01)	0.12***	(0.10 , 0.15)	0.01	(-0.01 , 0.04)
Marital status:						
Previously married	0.68***	(0.49 , 0.87)	0.04	(-0.14 , 0.22)	0.72***	(0.48 , 0.96)
Never married	0.83***	(0.64 , 1.03)	0.15	(-0.08 , 0.37)	0.78***	(0.53 , 1.03)
Cohabiting	-0.81***	(-1.04 , -0.57)	-0.14	(-0.44 , 0.16)	-0.45**	(-0.75 , -0.14)
Relationship change:						
Gain spouse/partner	-2.73***	(-3.00 , -2.45)	-0.20	(-0.76 , 0.36)	-1.67***	(-2.03 , -1.30)
Lose spouse/partner	2.06***	(1.84 , 2.29)	0.14	(-0.29 , 0.58)	1.70***	(1.42 , 1.97)
Household changes	0.03	(-0.01 , 0.08)	-0.00	(-0.05 , 0.05)	0.10***	(0.04 , 0.15)
Time Invariant						
Born in US	-0.19	(-0.44 , 0.05)	-0.07	(-0.29 , 0.16)	0.05	(-0.24 , 0.34)
Race:						
Black	0.19	(-0.01 , 0.39)	0.60***	(0.41 , 0.79)	0.14	(-0.09 , 0.37)
Hispanic	0.25*	(0.03 , 0.46)	0.35***	(0.15 , 0.55)	0.42***	(0.18 , 0.65)
Child's sex male	-0.01	(-0.09 , 0.08)	-0.01	(-0.10 , 0.07)	0.01	(-0.09 , 0.11)
Child's year of birth	0.00	(-0.02 , 0.03)	0.01	(-0.02 , 0.03)	-0.01	(-0.05 , 0.03)
Parents' education:						
Less than high school	0.01	(-0.24 , 0.26)	0.05	(-0.21 , 0.31)	0.11	(-0.28 , 0.50)
High school	0.05	(-0.20 , 0.29)	0.09	(-0.15 , 0.33)	0.08	(-0.30 , 0.45)
Some college	0.07	(-0.26 , 0.40)	-0.01	(-0.32 , 0.30)	0.24	(-0.18 , 0.66)
AFQT percentile	0.00	(-0.00 , 0.00)	-0.00	(-0.01 , 0.00)	-0.00	(-0.00 , 0.00)
Age at birth of child	-0.01	(-0.04 , 0.02)	0.09***	(0.06 , 0.11)	-0.02	(-0.06 , 0.02)
Self-esteem score	-0.01	(-0.02 , 0.01)	0.00	(-0.02 , 0.02)	-0.00	(-0.02 , 0.01)
Low birthweight	0.16*	(0.00 , 0.33)	-0.01	(-0.17 , 0.15)	0.03	(-0.18 , 0.24)
Drug use	-0.05	(-0.34 , 0.25)	-0.24	(-0.49 , 0.02)	0.18	(-0.06 , 0.42)
Binge drinking	0.14*	(0.01 , 0.28)	0.10	(-0.05 , 0.25)	0.11	(-0.05 , 0.26)
Constant	-11.15	(-66.95 , 44.65)	-25.92	(-77.13 , 25.30)	17.23	(-52.54 , 87.00)
Observations	107355					

Table 5: Household Types and Children's Outcomes

	Unadjusted		IPTW-adjusted	
	b	ci95	b	ci95
Education Outcomes				
High School Graduation				
Extended kin/non-kin	-0.15***	(-0.19 , -0.11)	-0.09*	(-0.16 , -0.02)
Adult sibling	-0.08**	(-0.14 , -0.03)	0.05	(-0.05 , 0.15)
Multigenerational	-0.07***	(-0.09 , -0.05)	-0.01	(-0.06 , 0.03)
College Attendance				
Extended kin/non-kin	-0.15***	(-0.20 , -0.10)	-0.08*	(-0.16 , -0.00)
Adult sibling	-0.07**	(-0.12 , -0.02)	0.06	(-0.02 , 0.15)
Multigenerational	-0.06***	(-0.08 , -0.04)	-0.00	(-0.04 , 0.04)
Health Outcomes				
Depression				
Extended kin/non-kin	0.08***	(0.04 , 0.12)	0.06	(-0.03 , 0.15)
Adult sibling	-0.05	(-0.10 , 0.01)	-0.08	(-0.19 , 0.04)
Multigenerational	0.01	(-0.01 , 0.03)	0.01	(-0.03 , 0.05)
Smoking				
Extended kin/non-kin	0.06**	(0.02 , 0.10)	0.04	(-0.04 , 0.13)
Adult sibling	-0.12***	(-0.17 , -0.06)	-0.12*	(-0.23 , -0.02)
Multigenerational	-0.00	(-0.02 , 0.02)	-0.03	(-0.07 , 0.01)
Obesity				
Extended kin/non-kin	0.05	(-0.00 , 0.09)	0.10**	(0.03 , 0.17)
Adult sibling	0.07*	(0.01 , 0.12)	0.03	(-0.06 , 0.13)
Multigenerational	0.05***	(0.03 , 0.07)	0.02	(-0.02 , 0.06)
Observations	6315		6315	

* p<.05, ** p<.01, and *** p<.001
All models include baseline controls.
IPTW weights top and bottom coded at 1%/99%