Household Instability During Childhood and Young Adult Outcomes

Citation

Permanent link

Terms of Use

Share Your Story

Household Instability during Childhood and Young Adult Outcomes

A dissertation presented

by

Kristin Laurel Perkins

to

The Committee on Higher Degrees in Social Policy

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

in the subject of

Sociology and Social Policy

Harvard University

Cambridge, Massachusetts

May 2017

Dissertation Advisor: Professor Robert J. Sampson   Kristin Laurel Perkins

Household Instability during Childhood and Young Adult Outcomes

Abstract

This dissertation argues for a more holistic conceptualization of children's exposure to change in their residential environments through three empirical chapters. Changes in parental romantic relationships, the focus of conventional measures of family instability, are an important component of family instability, but children are exposed to many other potentially consequential changes in the composition of their households. Non-parental changes, those involving extended family and non-relatives, also matter for children's wellbeing. I argue that the instability in children's residential arrangements is better captured by the theoretical concept of household complexity, rather than family instability. In addition to parental and non-parental changes in household composition, I consider a related disruption in children's lives, residential mobility, that is rarely considered in combination with family instability and changes in household composition.

The first chapter uses the Survey of Income and Program Participation and demonstrates that more children experience changes in household composition involving non-parent, non-sibling relatives than changes involving mothers, fathers, and non-relatives combined. These changes among other relatives are an underappreciated form of family instability that previous research focused on parents and parents' romantic partners misses. The second chapter estimates the consequences of children's exposure to parental and non-parental changes in household

composition using the Panel Study of Income Dynamics and a technique to facilitate causal inference. I find that experiencing changes involving parents or non-parent, non-sibling household members has a significant negative effect on high school graduation. The third chapter conceptualizes residential mobility and changes in household composition as a compounded change and finds that children who experience the most change in household composition during childhood are also the children who have the highest rates of residential mobility. Residential mobility and changes in household composition independently and jointly reduce the likelihood of high school graduation. By accounting for non-parental changes in household composition children experience and by acknowledging the compounded nature of changes in children's residential arrangements, this dissertation provides a more complete picture of the forces in children's lives that help and hinder their development into young adults.

Table of Contents

List of Tables and Figures

Figures

Acknowledgements

There are many people I wish to acknowledge for their advice and support while I was a doctoral student at Harvard, and particularly throughout the conceptualization and realization of this dissertation project. I will begin with my committee: Robert J. Sampson, Kathryn Edin, Alexandra Killewald, and Bruce Western. I have learned a great deal about how to be a researcher from Rob. I was fortunate to have the opportunity to work with him as a research assistant and collaborator and many of the lessons I learned from those experiences translated into my independent work on my qualifying paper and dissertation. I very much appreciate how enthusiastically he embraced a dissertation project that ended up being much more focused on family sociology than either of us anticipated at the outset.

Kathy has energetically supported my research ideas since I was a first-year student in the Sociology & Social Policy doctoral program. She encouraged me to pursue research questions about instability in children's lives and the summer I spent interviewing families in Cleveland for her research project provided rich context for the large-scale survey data I analyzed in this dissertation (that summer also confirmed for me that I am much more comfortable working with quantitative data than knocking doors to convince people to tell me their life stories).

Sasha kept me focused at all stages of this project and made sure I was answering the research questions that were most important to me. I have much more confidence in my skills as a quantitative researcher as a result of her feedback and guidance on my qualifying paper and dissertation. I feel fortunate to have gotten a lot of attention from her in her first year or two at Harvard before dozens of other graduate students clamored for her to be an advisor.

In some ways, Bruce is ultimately responsible for the arc of this dissertation project. In our first meeting about this project he encouraged me to look at trends in children's household instability using the SIPP. Ever since, he has provided thoughtful feedback about the work and my presentation of it.

Although he was not an official committee member, Matt Desmond has acted as an informal advisor to me while at Harvard. Matt generously encouraged me to submit papers resulting from our collaborative work to conferences I wanted to attend. No matter how intensely we were working on revisions or a new analysis for our projects, Matt always inquired about my independent work and advised me regarding the article submission process.

As director of the PhD Program in Social Policy, Pamela Metz has supported me since even before I was a student. I visited campus in the fall of 2009 before I submitted my application and Pam took the time to meet with me and answer all of my questions, invited me to the Monday Inequality & Social Policy seminar, and recruited then-student Ann Owens to show me around. Throughout my years in the program Pam has been a resource for all the particulars of the program requirements and she administered my grants from the Multidisciplinary Program in Inequality & Social Policy and the Graduate School of Arts and Sciences that provided financial support for this dissertation. Her support extends to the very end of the program as she arranged for an enviable spread of snacks and treats to celebrate my dissertation defense.

One of the things I value most about my fellow graduate students in the Department of Sociology and the Social Policy program is how generous they are with their time and advice for colleagues. I benefitted tremendously from students ahead of me in the program who shared their course assignments, fellowship applications, revision memos, and various cover letters as models for my own work and submissions. In no particular order, I want to acknowledge Ann Owens,

Nicole Deterding, Deirdre Bloome, Kim Pernell, Jeremy Levine, Tracey Shollenberger, Carly Knight, and Jackie Hwang for all of the various ways they supported me as a scholar. Although not graduates of our department, Jen Silva and David Pedulla have also provided valuable mentorship over the years. Jessica Tollette, Ryann Manning, and Erin Henry invited me to join their theory circle in our first year in the department and I have cherished their friendship and wisdom ever since. Students behind me in the program have also played an important role in the development of my dissertation and other work. I want to think Alix Winter, Brielle Bryan, Hope Harvey, and Jared Schachner in particular for their enthusiasm for my project and attendance at many of my presentations. I have also had a lot of fun over the years with everyone on this list.

   Finally, I owe my family a huge debt of gratitude for their encouragement and support. As a professor himself, my father gave me advice at every stage of my graduate school career and made sure that I was up-to-date on new research relevant to my work as well as important columns from The Chronicle of Higher Education. My mother made sure I knew how proud of me she continues to be and often suggested holidays in Chicago and South Carolina, welcome respites from Cambridge. My brother gamely tolerated my annoying habit of collecting a degree each year he is due to receive one, forcing us to share the spotlight in 2008, 2013, and 2017. My aunts, uncles, and cousins have supported me in various ways, from attending my conference presentations, to serving as informants and recruiting their friends to be interviewed for a course assignment, to treating me to delicious meals suggesting that I reciprocate "when you become a famous sociologist." (Scott is still waiting…)

   Zeke has been by my side through it all, since we were undergraduates writing urban and regional studies theses. He encouraged me to apply to PhD programs despite my uncertainty at the time about pursuing a career in academia. He has read many drafts of many assignments,

x

applications, and manuscripts. He has celebrated my accomplishments, shared coverage of my

work with family and friends, and kept me laughing even through rejection. He relocated to

Boston so that I could finish my PhD in residence and so that we could reach three important

markers in the transition to adulthood: cohabitation, marriage, and homeownership. Thank you,

for everything.

Introduction

Children are influenced by many dimensions of the environments in which they grow up. The determinants of children's wellbeing and outcomes have long been of interest to social scientists. Much research has focused on the family as a source of support for children as well as a site of stratification. This dissertation considers children's exposure to changes in their families and residential environments and measures the effects of these changes on educational attainment. I argue for a new definition of family instability that incorporates entry and exit by members of children's households beyond their parents and parents' romantic partners. In addition, this dissertation advances a conceptualization of compounded change acknowledging that residential mobility and changes in household composition often occur at the same time.

As families without two biological married parents have become more prevalent in the United States, scholars have increasingly investigated the implications of non-nuclear family structures for children's wellbeing. Studies of this sort generally find that children who grow up living with a single parent are disadvantaged compared to children who grow up with two parents at home (McLanahan and Sandefur 1994). Much of the early research on family structure treated it as a static characteristic of children's lives; they either grew up with a single parent or with two parents. More recently, however, research has recognized the dynamic nature of family structure, as a substantial proportion of children experience many different living arrangements and family structure transitions during childhood (Aquilino 1996; Beck et al. 2010; Cavanagh 2008; McLanahan 2011). This shift in focus from structure to process hypothesizes that it is the disruption and stress that comes with a transition in family structure that is consequential for

children's wellbeing and outcomes, and not necessarily the status of living with a single parent. Indeed, research that estimates the effect of experiencing parental divorce (Cherlin, Kiernan, and Chase-Lansdale 1995; Kim 2011) or experiencing multiple transitions in family structure (Cavanagh and Huston 2006; Fomby and Cherlin 2007; Fomby and Osborne 2010) finds that these transitions have negative effects on children's short- and longer-term outcomes.

Much of the research on family instability has focused exclusively on transitions involving parents in children's households, but children are exposed to many other potentially consequential changes in household composition. This dissertation begins with the understanding that family instability is a key process affecting the wellbeing of children. The goal of the empirical chapters is to present evidence supporting the expansion of the definition of family instability to account for the other members of children's households, both relatives and non-relatives, who enter and leave children's residential environments. Ignoring the non-parental changes in household composition that children experience could mean that the effects of family instability estimated by prior research understate the consequences of disruption since children with parental instability are being compared to a mixed group of children with and without other types of instability. Conversely, ignoring instability among extended family members and non-relatives could overstate the consequences of parental instability if changes among parents tend to be correlated with changes among other household members and the effect of changes among other household members is attributed to changes among parents. By accounting for both parental and non-parental contributions to family instability this dissertation provides a more complete understanding of how changes in children's developmental environments matter for their outcomes.

Changes in household composition are not necessarily isolated events. In addition to advancing a more holistic definition of family instability, this dissertation considers a related disruption in children's lives, residential mobility, that is rarely considered in combination with family instability and changes in household composition. Prior research finds that residential mobility is associated with a number of negative outcomes for children, including lower school performance and educational attainment, increased emotional and behavior problems, higher rates of teenage premarital sexuality and pregnancy, and earlier illicit drug use (Astone and McLanahan 1994; Hagan, MacMillan, and Wheaton 1996; Jelleyman and Spencer 2008; Simpson and Fowler 1994; Wood et al. 1993). Recent research estimates that over half of children experience changes in household composition at the same time as they experience residential mobility (Bachtell, English, and Haggerty 2012; Desmond and Perkins 2016), and some studies estimating the effects of residential mobility control for parental divorce (Fowler et al. 2014; Ziol-Guest and McKenna 2014). The third empirical chapter of this dissertation conceptualizes changes in children's environments as compounded and correlated change rather than isolating change in one dimension while holding constant change in another dimension.

In addition to the theoretical contribution this dissertation makes in the realm of family instability and compounded disruption in children's lives, I make a methodological contribution to the literature on family instability. Chapter 2 uses time-varying methods for causal inference to estimate the effect of different types of changes in household composition on children's educational attainment. Prior research on family instability relies overwhelmingly on conventional regression methods that do little to address selection bias. I address methodological limitations of prior research through a causal inference technique employing inverse probability of treatment weighting and marginal structural models.

Chapter Outline

The first empirical chapter presents a descriptive account of children's exposure to changes in their household composition. In addition to nationally-representative aggregate estimates, I compare patterns of household change across racial and ethnic subgroups, by family structure, and over time. Most research on family instability operationalizes instability as changes in coresident parents, but I show in Chapter 1 that children are exposed to many changes in their household composition beyond parents and parents' romantic partners. I use data from seven panels of the Survey of Income and Program Participation (SIPP) to follow children for approximately two years and prospectively track changes in their household roster. The SIPP is an especially useful source of data for tracking household change because of the frequency with which it surveys households: the survey collects a full household roster from respondents every four months enabling me to capture changes resulting from relatively short spells of coresidence that are missed by surveys collecting data annually or biennially.

Chapter 1 examines children's exposure to changes in household composition involving parents, non-relatives, and non-parent, non-sibling relatives, and demonstrates that more children experience changes among non-parent, non-sibling relatives (other relatives) than among mothers, fathers, and non-relatives combined. These changes among other relatives are an underappreciated form of family instability that previous research focusing on parents and parents' romantic partners misses. Disaggregating these results reveals striking differences in exposure to changes in household composition by race, even over a relatively brief period of two years, with 12 percent of black and Hispanic children experiencing other relatives leaving their households compared to only five percent of white children.

Trends in marriage, cohabitation, divorce, and childbearing suggest that there could be differences in children's exposure to changes in household composition over time. In general, analyses in Chapter 1 suggest that children in the 2000s were exposed to fewer changes in household composition than were children in the 1980s and 1990s. In particular, children in the 2000s were less likely to experience a father figure or an other relative joining their household than children two decades before. These trends are most dramatic among black children compared to white children and among children who live with single parents compared to children who live with two parents. Chapter 1 concludes that research on family complexity and instability should take a more holistic view of family instability by incorporating changes in household composition involving other relatives and by acknowledging the differences in the quantity and quality of household change by race.

Chapter 1 demonstrates what research focused solely on parental relationship dissolution and repartnering misses in terms of children's exposure to changes in household composition, especially for non-white children. Informed by these findings, Chapter 2 examines the consequences of children's exposure to parental and non-parental changes in household composition. Does household instability involving other relatives and non-relatives matter for children's outcomes? If the effects of these changes are minimal, we can be less concerned that the omission of non-parental changes in household composition from prior research on family instability biases those results. If, however, changes among non-parental household members are consequential for children's outcomes, then research that fails to consider the broader household roster is potentially underestimating the total costs to children of instability in their residential arrangements.

In Chapter 2 I argue that the instability in children's residential arrangements is better captured by the theoretical concept of household complexity, rather than family instability. To support this argument, Chapter 2 shows that analyses must consider the contributions of non-parental members to household instability to estimate the full consequences of family structure change for child wellbeing. I use data from the 1968 through 2013 waves of the Panel Study of Income Dynamics (PSID) to measure the effects of household changes on educational attainment. I construct household rosters for children at each wave of data collection and track who enters and exits their households from birth to age 15.

To facilitate causal estimates of the effects of changes in household composition during childhood on the probability of high school graduation, I use inverse probability of treatment weighting and marginal structural models. I find that experiencing changes among non-parent, non-sibling household members has a significant negative effect on high school graduation. This effect is similar in magnitude to the significant negative effect I find for children who experience changes involving residential parents compared to children who experience no changes among parents or other household members, which follows previous research on the deleterious effects of family instability for children. The results in Chapter 2 show that the negative effect of exposure to changes among non-parent, non-sibling household members is robust for white children but not significant among black children, suggesting there may be differences by race in the effects of changes in household composition on educational attainment.

Thus, the effects of changes among non-parental household members are not small. This chapter advances the literatures on family instability and multigenerational households by accounting for household changes children experience beyond parents and parents' romantic partners and by capturing the dynamic nature of extended family living arrangements.

Conventional measures of changes among residential parents miss the nearly 20 percent of children who experience changes among household members other than parents or siblings. By showing that changes in non-parental household members are both common and consequential experiences for children, I demonstrate the value of conceptualizing the changes in developmental environments to which children are exposed as a product of household complexity, rather than simply family instability.

Chapter 3 builds on the results of Chapters 1 and 2 by considering a different dimension of instability in children's developmental environments: residential mobility. Previous research acknowledges that changes in family structure and residential mobility often occur at the same time, with one change prompting the other. Rarely, however, has previous research conceptualized moving and household composition change as a compounded change that could affect children differently than experiencing the two types of changes independently. Often a singular focus on residential mobility or family instability is deliberate, resulting from an attempt to determine a precise effect of an event on an outcome while holding other variables constant. I argue in Chapter 3 that isolating one type of change in children's lives fails to capture their lived experiences and provides an incomplete understanding of how instability and disruption matter for children's long-term outcomes.

Chapter 3 uses the 1968 through the 2013 waves of the PSID and employs the same household roster construction and exposure to household change variables that were integral to the analysis in Chapter 2. Chapter 3 draws on the head of household survey and restricted use geocoded data to create a unique indicator of residential mobility for each child in the sample. I show that nearly 80 percent of children move at least once before the age of 15 and nearly 40 percent of children experience a change in household composition at the same time that they

move. In addition, my descriptive findings suggest that the children who experience the most changes in household composition during childhood are also the children who have the highest rates of residential mobility.

The analyses in Chapter 3 advance an attempt to conceptualize residential mobility and changes in household composition as compounded change in children's lives. Models testing the effects of these changes on probability of high school graduation suggest that changes in household composition and residential mobility independently and jointly reduce the likelihood of high school graduation. Research that fails to account for both residential mobility and changes in household composition is missing a dimension of instability in children's lives that is consequential for their outcomes and does not reflect the reality of how many children experience these changes as compounded changes rather than disruptions in isolation.

I conclude the dissertation with a final chapter that summarizes the findings of the three empirical chapters and argues for the importance of a more holistic definition of children's exposure to instability in their households. This dissertation is a first step in a longer research agenda focused on the effects of different types of changes in developmental environments to which children are exposed and the conclusion suggests directions for future research.

Household Complexity and Change among Children in the United States, 1984-2010

As family structures other than two married biological parents have become more prevalent in the United States, scholars have increasingly investigated the implications of non-nuclear family structures for children's wellbeing. This body of research tends to find that children living with two married biological parents fare better than children growing up with any other household configuration, such as single mother, married stepfamily, or cohabiting union households. Though much of this research treats family structure as a static characteristic, it is better characterized as a dynamic process; a substantial proportion of children experience many different family structures and family structure transitions during childhood (Aquilino 1996; Beck at al. 2010; Cavanagh 2008; McLanahan 2011). One theory connecting family structure to child outcomes argues that the stress of family structure disruption contributes to worse outcomes for children living in non-nuclear family structures (Aquilino 1996; Foster and Kalil 2007).

Divorce and the subsequent departure of a parent is the most common family structure disruption studied in prior research, with general agreement that this transition is linked to negative outcomes in childhood, adolescence and across generations (Amato and Cheadle 2005; Cherlin, Kiernan, and Chase-Lansdale1995; Kim 2011). Multiple transitions among family structures are associated with lower school engagement, externalizing behavior, and negative relationships with teachers and peers in young children (Cavanagh and Huston 2006; Fomby and Cherlin 2007; Fomby and Osborne 2010; McLanahan 2011), and lower educational attainment, early home leaving, premarital childbearing, depression, delinquency, and drug use in

adolescents (Aquilino 1996; Brown 2006; Cavanagh 2008; Wu 1996). Parental relationship transitions (e.g., divorce) are also associated with maternal parenting stress, harsh parenting, and parent mental health (Beck et al. 2010; McLanahan 2011). Cavanagh and Huston (2006) found evidence that children in the most disadvantaged contexts, those characterized by maternal depression, poverty and a poor home environment, are most affected by family structure instability.

Changes in parental romantic relationships are important as a measure of family instability, but children are exposed to many other potentially consequential changes in the composition of their households. Non-parental changes, such as the departure of grandparents, aunts, and cousins, are associated with early childhood cognitive scores (Mollborn, Fomby, and Dennis 2012) and I show in this chapter that many more children are exposed to changes in their household structure than are captured by traditional measures of family structure change. As a result, prior research focused exclusively on parents may be missing a substantial source of instability in children's lives, and analyses seeking to identify the consequences of family structure change for child wellbeing should be broadened to consider the contributions of other relatives and non-relatives to household instability. That household composition changes involving non-parent relatives and/or non-relatives are disproportionately experienced by non-white children and children in households without two parents also means that we have an incomplete understanding of subgroup differences in family structure and household instability.

This study addresses this gap in knowledge by considering changes in household composition beyond parents that children experience and assesses whether characteristics of the child and household, particularly the child's race and ethnicity and family structure, predict greater or lesser exposure to these changes. Just as Raley and Wildsmith (2004) descriptively

10

demonstrated the importance of including maternal transitions into and out of cohabitation in measures of family instability, I aim in this study to document the contribution of other individuals to changes in children's developmental contexts. I estimate exposure to changes in household composition in a nationally-representative sample of children under age 15 using the Survey of Income and Program Participation (SIPP) from 1984 to 2010. I find that the entry and exit of non-parent, non-sibling relatives, whom I call "other relatives," are substantial sources of household composition changes experienced by children, far exceeding the number of changes in parental figures to which children are exposed. This implies that research focusing narrowly on parental relationship changes misses a potentially important type of household change to which children are exposed and that estimates of the effect of family structure change may be biased if other relatives are not accounted for in the measure of family change. I describe the composition of this group of relatives, most of whom are grandparents, aunts, and uncles, and how the composition varies by race and ethnicity.

I also assess whether and how children's exposure to household change has changed over time. Rates of marriage, divorce, cohabitation and childbearing, and the characteristics of those involved, have all changed over the last 30 years, with women generally cohabiting before marriage and marrying later, an increase in non-marital births, and declining divorce rates among younger adults (Kennedy and Ruggles 2014; Kreider and Ellis 2011; Manning 2013; Martin et al. 2015). These trends in family life have the potential to expose children to more or, alternatively, fewer changes in household composition, suggesting that more recent cohorts of children may be exposed to different types or levels of household change than earlier cohorts of children. Therefore, it is important to examine trends in children's exposure to household change over time to assess whether changes in family formation and dissolution have led to changes in

the types and quantities of household changes children experience. In general, I find that children

in more recent cohorts are less likely than children in earlier cohorts to experience the entry of a

father figure or entry or exit of a non-parent, non-sibling relative into or out of their household.

This suggests that household instability may be qualitatively different among more recent

cohorts of children than among earlier cohorts of children.

Motivation and Research Strategy

Although nearly all research on family instability has focused on parental relationship

changes as the source of instability, a growing number of scholars argue for a more

comprehensive view of instability, capturing other types of household composition changes that

are potentially consequential for children (Condliffe, Warkentien, and DeLuca 2013; Mollborn,

Fomby, and Dennis 2011; Warkentien, Condliffe, and DeLuca 2013). Prior research investigates

the consequences of extended family coresidence for children and the role that doubling up plays

for families in need, suggesting that there may be meaningful consequences of instability in these

households for children's outcomes. Bengtson (2001) argued that among single-parent or other

non-nuclear families, multigenerational bonds play an increasingly important role, and single

women with children are more likely than other types of households to live in multigenerational

households (Cohen and Casper 2002; Pilkauskas 2012). Compared to living with a single mother

alone, children living with a single mother and at least one grandparent are less likely to be poor

or near poor (Mutchler and Baker 2009); living in a doubled-up or multigenerational household

can be a response to economic need (London and Fairlie 2006; Pilkauskas 2012). Although

children often have more economic resources in multigenerational households, grandparent

coresidence may not be positive in all respects. Chase-Landsale, Brooks-Gunn and Zamsky

(1994) found that grandmother coresidence with young mothers and their children is negatively associated with both mother and grandmother parenting quality in a sample of low-income African American families. Single mothers may prefer to raise their children in a nuclear family unit rather than relying on extended family for support (Edin and Kefalas 2005; Harvey 2015).

These studies demonstrate the association between extended family coresidence and child outcomes at one point in time, but multigenerational families are characterized by a great degree of instability. Glick and Van Hook (2011) found that very few households containing more than one family unit have consistent household composition over time – after one year 62 percent of multi-family households experienced some change in composition and after five years 93 percent of households had changed; multi-family households containing young children are somewhat more likely than those without children to experience change. Pilkauskas (2012) also documented considerable fluidity in three-generation households. Research on child outcomes should account for the frequent transitions between two- and three-generation households, integrating extended family instability into the literature on parental relationship changes. Mollborn, Fomby and Dennis (2012) looked at a single cohort of children born in 2001 and find that having grandparents or other adults join or leave a child's household is associated with child cognitive outcomes independent of parent relationship transitions. Effects differed by race, with nuclear households most advantageous for white children, who were negatively affected by any transition in extended family or other relatives. African American children were also negatively affected by transitions, but stable grandparent coresidence predicted higher cognitive scores for black children than other family arrangements. Finally, instability appeared to benefit Latino children, as those experiencing extended family or other adult transitions had the highest cognitive scores compared to Latino children in other living situations.

Given that prior research demonstrates that instability in residential parental figures has negative effects on children's outcomes, above and beyond the effects of family structure, and also demonstrates that household composition beyond parental figures is associated with child outcomes, it is likely that instability involving non-parental household members also affects children's outcomes. It is therefore relevant to assess the extent to which children are exposed to these transitions and how exposure varies by race, family structure, and cohort. The entry or exit of household members other than parents and their partners could affect children through the quantity and quality of household resources available to them. In particular, parenting quality may suffer as individuals join or leave the household if these changes place additional burdens on children's parents. Conversely, children may have better outcomes as a result of changing household composition if these changes bring additional resources or supervision to the household. Household transitions may additionally affect children negatively if the change itself is a stressful disruption in the routine functioning of the household.

Many studies investigating the consequences of family instability assess differences in effects by race and ethnicity, finding generally that family instability has negative effects on white children but not uniformly negative effects on black or Hispanic children (Fomby and Cherlin 2007; Mollborn, Fomby, and Dennis 2012). Blacks and Hispanics are more likely than whites to live in multigenerational homes (Cohen and Casper 2002; Pilkauskas 2012), and some work (Fomby, Mollborn, and Sennot 2010; Mollborn, Fomby, and Dennis 2012) has proposed mechanisms, such as social protection and exposure to disadvantaged neighborhoods, that might explain these differences. Differential exposure to changes in household composition among black and Hispanic children could be another mechanism explaining why they are differentially

affected by family instability. My analyses assess whether and by how much black and Hispanic children experience different patterns in changes in household composition.

Accounting for Social Change

Over the time frame analyzed in this chapter, 1984 to 2010, there have been substantial changes in patterns of marriage, childbearing and cohabitation that could contribute to trends in children's exposure to household change. Understanding these changes may help us understand trends in children's exposure to changes in household composition. The average age at marriage has increased over the last 30 years as shown by the proportion of women never married by certain ages: by 2009 nearly half of women aged 25-29 and 27 percent of women aged 30-34 remained unmarried whereas the corresponding statistics in 1986 were 27 percent and 14 percent (Kreider and Ellis 2011). Changes in childbearing are related to changes in marriage. Between 1980 and 2010, the percent of births occurring to unmarried women more than doubled, increasing from 18.4 percent to 40.8 percent (Martin et al. 2015). Children born to unmarried women could, on average, be exposed to more household change than children born to married women in part because cohabiting parents are much more likely than married parents to dissolve their unions but also because such women are quite likely to repartner (Andersson 2002; Beck et al. 2010). Increasing shares of children born to unmarried women suggests that a greater portion of children overall could face changes in household composition.

Trends in divorce and cohabitation, however, suggest that children in more recent cohorts could have lower exposure to parental change than children in older cohorts. Although the most recent age-adjusted divorce rates show that divorce rates have not declined overall, there are distinctive patterns by cohort that place children at decreased risk of seeing their parents' marital

15

unions dissolve. Divorce rates have increased among people over age 35, yet the divorce rate among younger couples – those in their prime family-building years – is steady or declining (Kennedy and Ruggles 2014; Shoen and Canudas-Romo 2006). The pattern among older cohorts is in part driven by a "divorcing generation", the baby boom cohort who continues to experience high rates of divorce even into retirement (Kennedy and Ruggles 2014).

Changes in cohabitation are tied to changes in marriage and divorce. In the 2000s and 2010s a much greater percentage of women have ever cohabited compared to in the 1980s and 1990s, and two-thirds of women who married between 2000 and 2010 cohabited before marriage (Manning 2013). In addition to being more prevalent, cohabiting unions have also become less stable overall, with fewer of them transitioning to marriage and more of them dissolving over a three-year period (Guzzo 2014). But Musick and Michelmore (2015) showed that dissolution rates specific to cohabiting couples with children have declined over time, leading to fewer children in cohabiting unions exposed to parental change than in the past. The increase in children born to unmarried parents suggests children may be exposed to more household changes in the 2000s and 2010s than in the 1980s and 1990s (Brown, Stykes, and Manning 2016) whereas more union stability among married and cohabiting parents of children suggests a countervailing force of stability leading to less exposure to household change over time.

Data and Methods

I use the U.S. Census Bureau's Survey of Income and Program Participation (SIPP) to analyze trends in children's exposure to household changes. The SIPP data include panels of nationally-representative households that are followed for a period of two and a half to four years. The first panel began in 1984 and there have been 14 panels of data collected, the most

recent beginning in 2008. This design allows me to prospectively track changes in households within panels, because the SIPP collects household roster data every four months over a period of two and a half to four years, and compare the prevalence of household changes across different characteristics of households to determine whether exposure to household changes differs by group. The SIPP is an especially useful data source for this research question because it includes longitudinal data for large, nationally-representative samples, between 35,000 and 45,000 households per panel for the 1996-2008 panels.

I use the 1984, 1987, 1990, 1996, 2001, 2004 and 2008 SIPP panels. There are between seven and 12 waves per panel. For these analyses I employ the SIPP's longitudinal panel weights that adjust for sampling design and non-response; therefore my analysis is limited to the waves in each panel covered by these weights. The SIPP collects data on each person living in a sampled household at all waves of the panel. If a member of a sampled household moves to a new address, the SIPP follows that person and collects data on each person in his or her new household. This data collection strategy allows for a dynamic and comprehensive accounting of each original sample member's household at every wave of the survey.

I take a child-focused approach to examining changes in household composition, which I conceptualize as an indicator of family instability. I limit my sample to households with children and I use the detailed SIPP data to create a complete household roster at each wave of data collection. Each wave of the SIPP includes a core module with a household relationship variable. This variable indicates each household member's relationship to the household reference person (often the head of household). I use this variable to assign each household member a relationship to each child in the household (see Appendix A for matching of detailed relationship to aggregate category). If the subject child is listed as a child of the reference person, I assign the

17

household reference person as mother or father based on sex. I also assign any spouse of the household reference person as mother or father based on sex. This means that stepmothers and stepfathers are included in the mother and father categories I analyze in this chapter as it is not possible to consistently distinguish biological parents from stepparents across SIPP panels. The SIPP data also include the survey identification number of any parent who lives in a SIPP-surveyed household with his or her minor or adult children. If I cannot assign parents to children based on the reference person and spouse of the reference person indicators, and the child lives with at least one parent, I use the survey identification number of the child's parent to identify that person as mother or father. This allows me to link parents and children in non-nuclear households where the parent is not the reference person. The findings I present here are based on an analytic sample of children under age 15. The sample includes 72,312 children across seven panels.

In this chapter I focus on eight measures of household instability. The first four capture the traditional measures of parental figures leaving or joining the household: mother leaving, mother joining, father leaving, father joining. For simplicity I refer to this as the parent exiting or entering, though this type of transition can occur in either of two ways: the parent could leave the household or the child could move to a different address without the parent. The remaining four measures of household instability broaden the scope beyond changes in parental figures to include other relatives (e.g., grandparent, aunt, uncle, cousin), and non-relatives (e.g., roommate, friend) entering or leaving the child's household. I do not measure the entry or exit of children's siblings in this analysis because it is not possible to distinguish among full, half-, and step-siblings using the core modules of the SIPP and there is reason to believe that the consequences

of change among siblings could vary based on how they are related to the child (I return to this point in the limitations section below).

I begin my analysis by calculating weighted cumulative percentages of children exposed to each distinct type of household change. I follow children over six waves of data collection and add the percentage of children who experience each type of change at each wave to the percentage of children experiencing that type of change in any prior wave. I report aggregate cumulative percentages by type of change and then disaggregate the cumulative percentage calculations by race/ethnicity and family structure at Wave 1.

To assess whether children in more recent cohorts experience more or less household change compared to children in earlier cohorts, I use logistic regression analysis to predict the binary outcome of whether children experience household change, conditional on panel indicators and other covariates. I am particularly interested in whether children in more recent cohorts are significantly more or less likely than children in earlier cohorts to experience household change. I run a separate model to predict each specific type of household change (e.g., father leaving, other relative joining). Equation 1.1 presents the general logit model I use to predict exposure to household change:

Eq. 1.1: $\log\left(\frac{p}{1-p}\right) = \alpha + p'\gamma + x_i'\beta$

The model contains dummy variables, p', for each SIPP panel from 1987 through 2008 (with the earliest panel, 1984, as the reference panel). The vector x_i' includes indicators for race/ethnicity and a continuous variable for child's age at Wave 1. I report results for non-Hispanic white, non-Hispanic black, and Hispanic children because these three groups compose the vast majority of the sample and the residual other race category is a heterogeneous group. I control for

race/ethnicity, measured at Wave 1, with three indicators (black, Hispanic, and other race, with white as reference). I use the longitudinal panel weights to weight these models and I cluster standard errors at the household level because I include all children under age 15 and my sample includes households containing multiple children.

Results

Table 1.1 presents weighted sample statistics across the seven SIPP panels. The children are between eight and nine years old, on average, when the observation period ends, though children who range from 0 to 14 at Wave 1 are included in the analysis. In the 1984 panel, close to three-quarters of the children are white, with blacks and Hispanics making up 15 percent and 9 percent of the sample, respectively. Across the panels, the proportion of children who are white declines, to 56 percent white by 2008, and the proportion of Hispanic children increases to 22 percent. Household size, averaging about 4.5 members, stayed fairly constant across panels. A very high proportion of these young children live with mothers or mother figures at the start of observation, approximately 95 percent whereas the proportion who live with fathers or father figures is lower, at between 75 percent and 78 percent across panels. Given the rise in births to unmarried mothers over the time span of my analysis, it may be surprising that there is not a more prominent decline over the panels in the proportion of children who live with fathers at the beginning of observation. I count children whose parents are cohabiting but not married as living with their fathers and mothers. Across panels approximately six to eight percent of children live with at least one grandparent at Wave 1. Finally, the children's coresident mothers are on average about 33 years old in 1984 and 36 years old in 2008 and their coresident fathers are on average 36 years old in 1984 and 39 years old in 2008.

Table 1.1. Weighted Sample Statistics across 1984, 1987, 1990, 1996, 2001, 2004 and 2008 SIPP Panels.

	1984 Mean	1987 Mean	1990 Mean	1996 Mean	2001 Mean	2004 Mean	2008 Mean
Age at end of period	8.51	8.47	8.49	8.70	8.89	8.90	8.61
SD of Age	(4.42)	(4.32)	(4.33)	(4.26)	(4.27)	(4.38)	(4.49)
Race/Ethnicity							
White	.72	.71	.70	.65	.62	.59	.56
Black	.15	.15	.14	.16	.16	.15	.14
Hispanic	.09	.11	.11	.14	.17	.19	.22
Other Race	.04	.04	.04	.05	.05	.07	.08
Wave 1							
Household Size	4.67	4.53	4.52	4.56	4.59	4.52	4.56
SD of Household Size	(1.7)	(1.51)	(1.49)	(1.45)	(1.63)	(1.50)	(1.55)
Two Parent	.76	.75	.75	.75	.73	.73	.72
Single Parent	.22	.24	.23	.23	.23	.24	.25
No Parent	.02	.02	.02	.03	.03	.03	.03
Live with Mother	.96	.96	.96	.96	.94	.95	.94
Live with Father	.78	.77	.76	.76	.76	.76	.75
Live with Grandparent	.06	.06	.06	.06	.07	.07	.08
Mother's Age	32.66	33.21	33.27	34.43	35.06	35.28	35.56
SD of Mother's Age	(7.07)	(6.67)	(6.68)	(6.65)	(7.08)	(7.29)	(7.51)
Father's Age	35.83	35.88	36.36	37.41	38.08	38.16	38.53
SD of Father's Age	(7.68)	(7.16)	(7.11)	(7.11)	(7.51)	(7.76)	(8.06)
Waves	6	6	6	6	6	6	6
N	3,794	5,061	10,489	12,877	12,219	15,749	12,123

Figure 1.1 demonstrates that children are exposed to changes in their household composition beyond what is captured by looking at the exit or entry of parental figures. The left panel shows the weighted cumulative proportion, over six waves of data collection pooled across all panels, of children who experience four types of household changes: losing a father figure, losing a mother figure, losing a non-parent, non-sibling relative (an "other relative"), and losing a non-relative. The type of household change affecting the greatest share of children is a non-parent, non-sibling relative leaving the household; over seven percent of children experience this change over the course of two years. More children experience the departure of a non-parent, non-sibling relative than all other household departures combined. The right panel in Figure 1.1

shows the weighted cumulative proportion of children who experience the addition of the same four types of household members: father, mother, other relative and non-relative. Similarly, many more children experience the entry of a non-parent, non-sibling relative than the entry of a father or mother figure.

Household Members Gained

Household Members Lost

- - Dad   —— Mom   ·······Non-Relative   —·· Other Relative
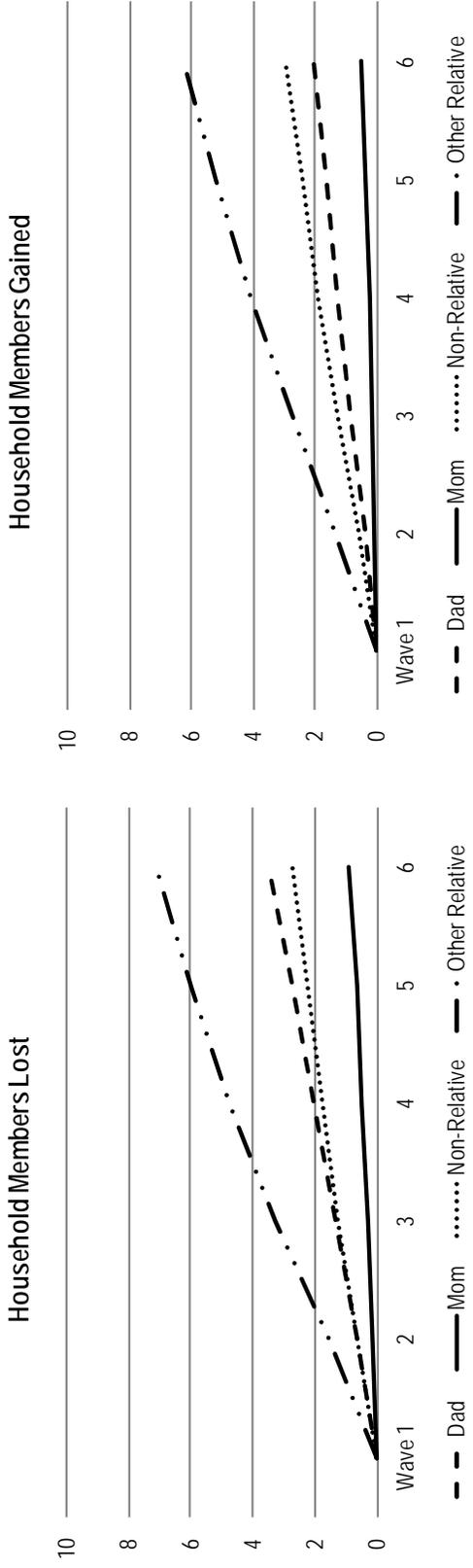
Figure 1.1. Cumulative Percent of Children Exposed to Changes in Household Composition: pooled 1984 through 2008 Panels

Other Relatives Join

Other Relatives Leave

- - Overall   —◆— Two Parents   —■— Single Parent   —●— No Parents
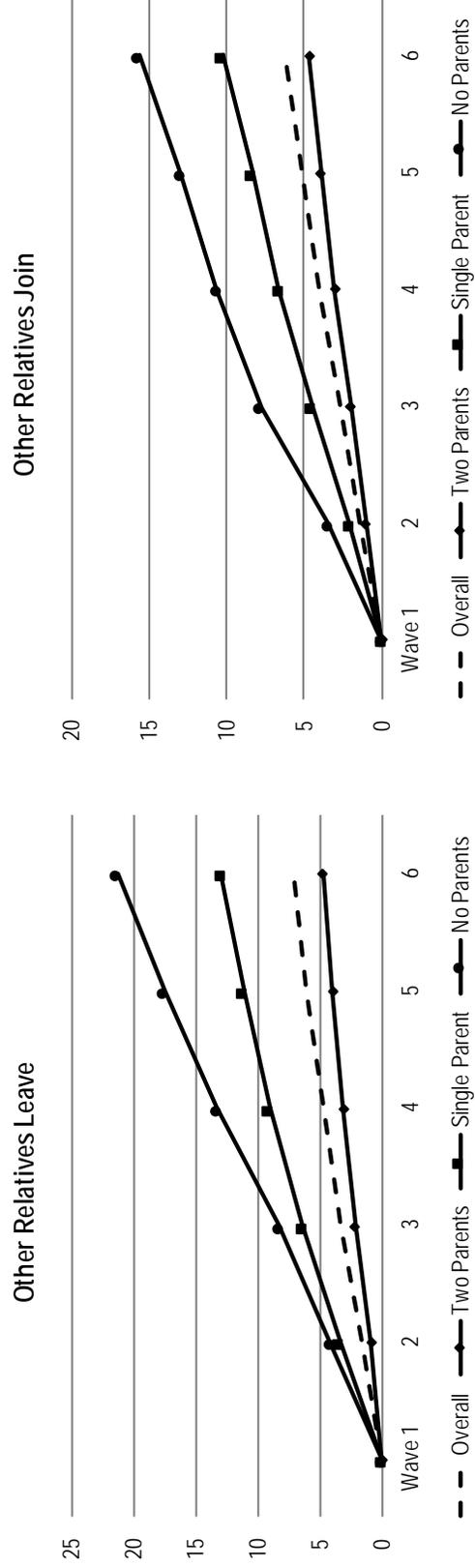
Figure 1.2. Cumulative Percent of Children Exposed to Other Relatives Leaving and Joining Household, by Family Structure

23

Who are these non-parent, non-sibling relatives living with children and moving in and out of their households? Selected panels and waves of the SIPP survey include a household relationship matrix that identifies every household member's relationship to every other person living in the household at that point in time. I use this matrix from the 1996 and 2008 panels, available once per panel, to provide a more detailed assessment of how individuals in the other relative category are related to children in my sample. Overall, grandparents represent the biggest proportion of other relatives living in children's households at any given time. Grandparent co-residence also appears to be more stable than co-residence with aunts, uncles and cousins. Cousins are the most frequent type of other relative to leave and join children's households, representing 30 percent to 40 percent of changes in this category, followed by aunts and uncles, followed by grandparents, who represent only 20 percent of other relative transitions even though they account for approximately 40 percent of the non-parent, non-sibling relatives who live with children. The disproportionate contribution of cousins, aunts, and uncles to household transitions is especially pronounced among black and Hispanic children.

Heterogeneity in Change by Family Structure and Race

These estimates of the average share of children exposed to different types of household change mask considerable heterogeneity by family structure and race, two characteristics of children and their households that are associated with other features of their developmental environments and eventual outcomes. Here I focus on differences by group in the other relative and non-relative category because the aggregate analysis shows more children are exposed to these changes than are exposed to a parent leaving or joining their household; further, the differences by racial/ethnic and family structure group are most pronounced for these types of

household change. For example, if we look only at the proportion of children experiencing a

parent leaving the household there are negligible differences by race, but examining the

proportion of children who experience the departure of a relative or non-relative reveals striking

differences by race missed by the traditional measures of family structure change. This matters

because any differences by race in the effects of family instability could be the result of

household transitions among extended family and non-relatives rather than other mechanisms

proposed in the literature.

I categorize children by family structure at Wave 1: living with two parents (both

biological or one biological and one stepparent, 74 percent of sample), living with a single parent

(mother or father, 24 percent), or living with no parents (2.5 percent). Figure 1.2 shows that

between six and seven percent of children overall are exposed to changes in other relatives in

their households, but these types of changes are much more common among children living with

single parents or no parents at the start of data collection. By the end of six waves of data

collection, or about two years, 13 percent of children living with a single parent had experienced

a relative leave their household and 21 percent of children living with no parents experienced

this change, compared to less than five percent of children who started with two parents.

Children who start in single parent and no parent households are also more likely than children

from two parent families to have other relatives join their households over the course of two

years. Approximately 10 percent and 16 percent of children starting in single parent and no

parent homes, respectively, have an other relative join them at some point over two years,

whereas only five percent of children from two parent homes experience this type of change.

Figure 1.3 shows that a much lower share of children in two parent homes than children in single

parent and no parent homes are exposed to the exit or entry of non-relatives, less than two

percent of children in two parent homes compared to seven percent of children in single or no parent homes. Taken together, the analysis of exposure to extended family and non-relative household change shows that children who start out in households conventionally viewed as disadvantaged, those with only one parent or no parents present, have a higher likelihood of experiencing changes in household composition than do children who start out in more advantaged households.

Non-Relatives Join

Wave 1   2   3   4   5   6

-- -- Overall   — Two Parents   — Single Parent   — No Parents

Non-Relatives Leave

Wave 1   2   3   4   5   6

-- -- Overall   — Two Parents   — Single Parent   — No Parents
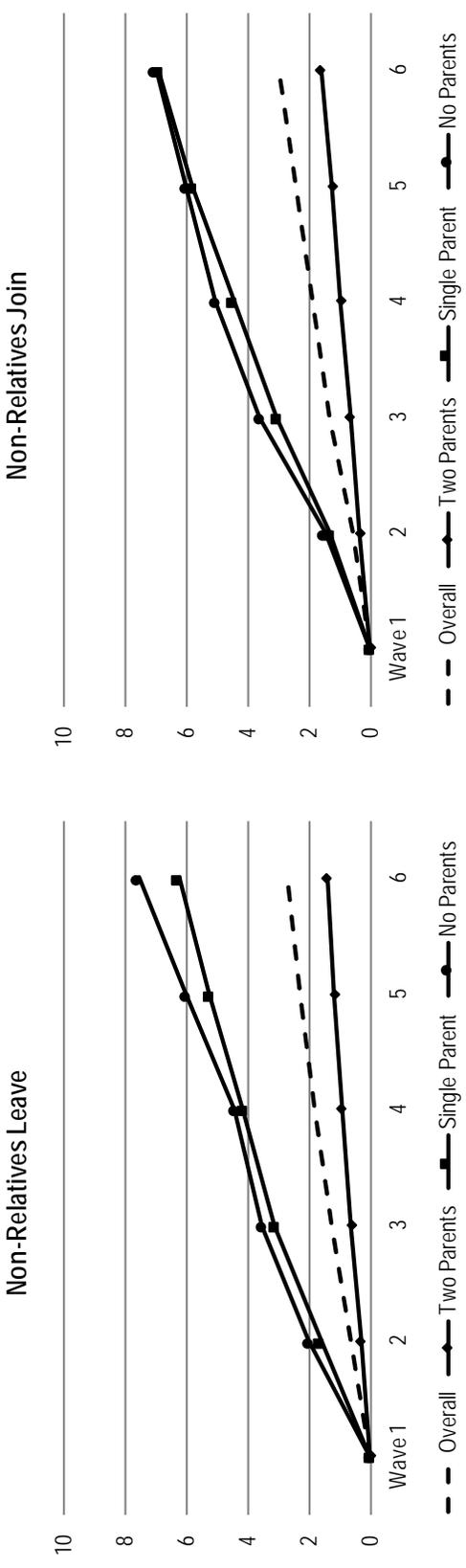
Figure 1.3. Cumulative Percent of Children Exposed to Non-Relatives Leaving and Joining Household, by Family Structure

Other Relatives Join

Wave 1   2   3   4   5   6

-- -- Overall   — White   — Black   — Hispanic

Other Relatives Leave

Wave 1   2   3   4   5   6

-- -- Overall   — White   — Black   — Hispanic
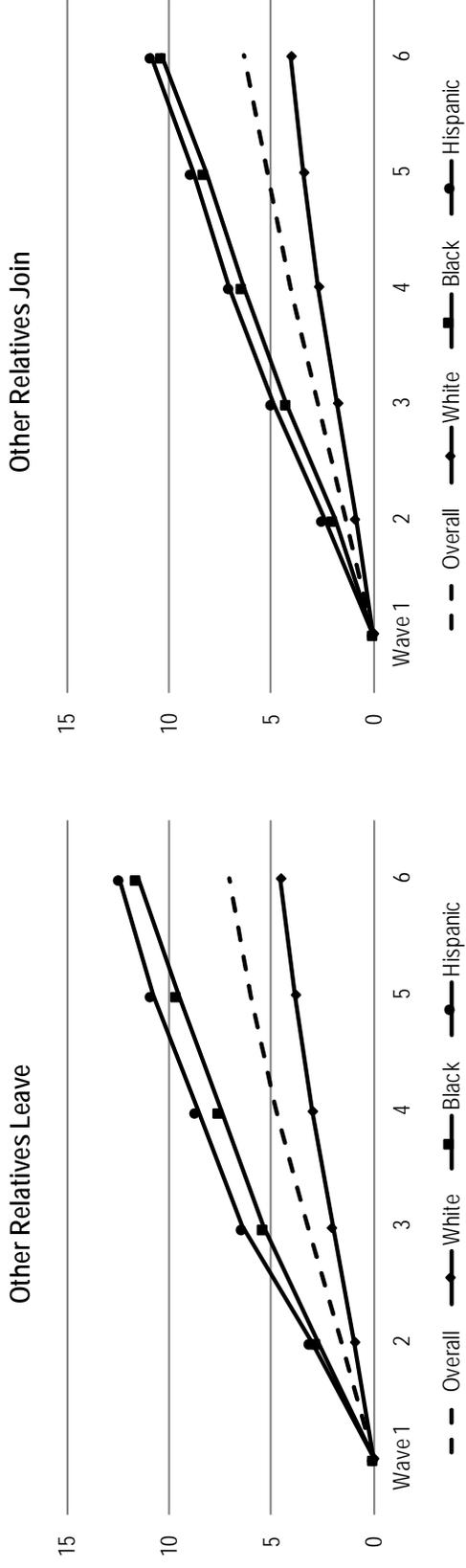
Figure 1.4. Cumulative Percent of Children Exposed to Other Relatives Leaving and Joining Household, by Race/Ethnicity

27

Figure 1.4 shows weighted cumulative percentages of children across panels exposed to the

entry or exit of a non-parent, non-sibling relative, overall and within three racial/ethnic groups.

The dashed line represents the overall proportion, showing that seven percent of children

experienced the departure of an other relative by the end of two years; the lines marked by

squares and circles shows the relatively higher exposure to this change among black and

Hispanic children, both at 12 percent, compared to white children, designated by the diamond

markers, at five percent by the end of observation. Black and Hispanic children are also

disproportionately exposed to the entry of a non-parent, non-sibling relative, with 10 percent and

11 percent of children experiencing this change over two years compared to only four percent of

white children. This analysis by race demonstrates that even over a relatively short period of two

years, non-white children are disproportionately exposed to changes in household composition as

a result of non-parent, non-sibling relatives entering and exiting their households.

These findings by family structure and race/ethnicity result from a pooled analysis of all

seven SIPP panels, but there is reason to suspect that the proportion of children exposed to

changes in household composition may have changed over time as the marital and cohabiting

unions containing children have become more stable over time (Kennedy and Ruggles 2014;

Musick and Michelmore 2015).

Change over Time

Following the cumulative percentage analysis above, I run logit models for the aggregate

sample and separately by children's race/ethnicity and Wave 1 family structure: two parent,

single parent or no parent. In Figures 1.5 through 1.7 I present estimated odds ratios representing

the odds of experiencing one of three specific types of household change over the course of two

years (when observation ends) in the 1987 through 2008 panels, with 1984 as the reference category (odds ratio = 1). The three specific types of household change shown in Figures 1.5 through 1.7 are father entering the household and other relative exiting or entering (no clear time trends are apparent for mother entry and exit, very rare events, father exit, and non-relative entry or exit). These odds ratios are interpreted as the odds that children in each panel experience the specified change in household composition compared to the odds of children in the 1984 panel experiencing the change. In the aggregate models, the odds ratios for more recent panels are significantly lower than the 1984 panel for exposure to father entry, other relative entry and other relative exit, suggesting these changes have become less common, that is, fewer children experience them, over time.

Trends in children's exposure to father exit and entry and the entry and exit of other relatives are clearer when I disaggregate the sample based on Wave 1 family structure. There are no clear time trends in father exit, in the aggregate sample or within subgroups starting with a single parent or two parents (father exit is particularly rare among children who live with a single parent at Wave 1). Both in the aggregate and among children who start the panel with single parents, children in more recent panels have lower odds of father entry than in earlier panels, particularly compared to 1984 (Figure 1.5 shows odds ratios with 95 percent confidence intervals). The significantly lower odds ratio in the 2008 panel suggests that children in single parent families in 2008 were less likely to experience a father joining their household than were children in single parent families in earlier panels.

Dad Enter: Two Parent Family

	1984	1987	1990	1996	2001	2004	2008
	1	0.495	0.908	0.57	0.572	0.694	0.524

Odds Ratio — OR — 2, 1.5, 1, 0.5, 0

Dad Enter: Full Sample

	1984	1987	1990	1996	2001	2004	2008
	1	0.812	0.966	0.898	0.787	0.789	0.657

Odds Ratio — OR — 2, 1.5, 1, 0.5, 0

Dad Enter: Single Parent Family

	1984	1987	1990	1996	2001	2004	2008
	1	0.875	0.929	1.052	0.853	0.774	0.635

Odds Ratio — OR — 2, 1.5, 1, 0.5, 0
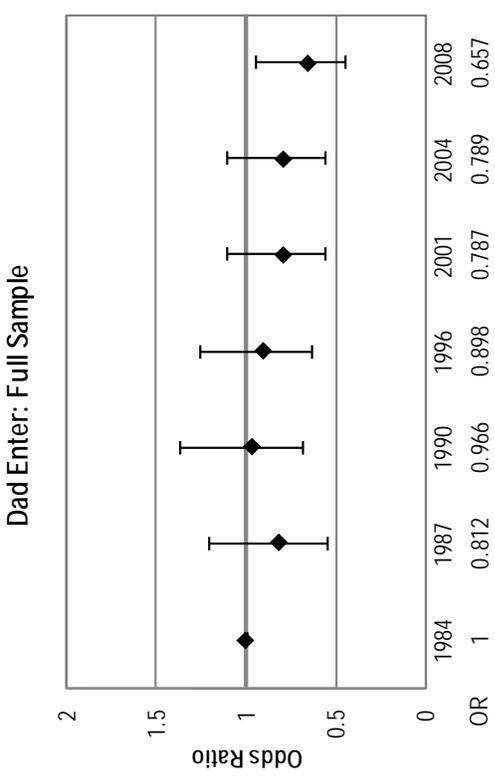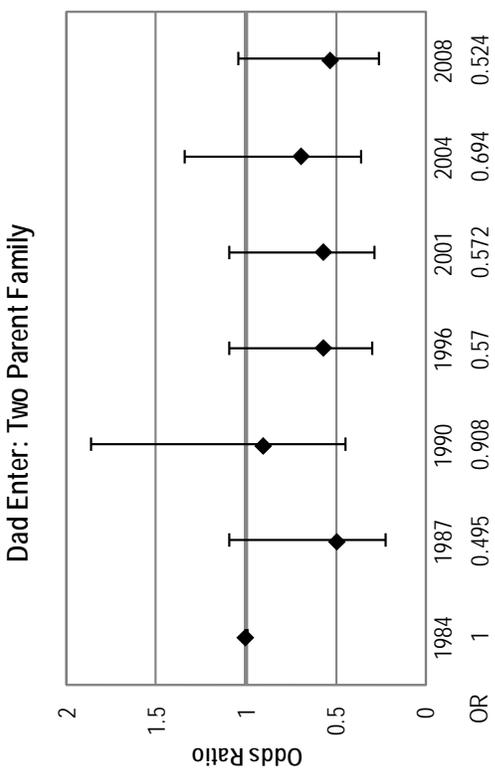
Figure 1.5. Odds Ratios across Panels for Father Entry, by Family Structure

30
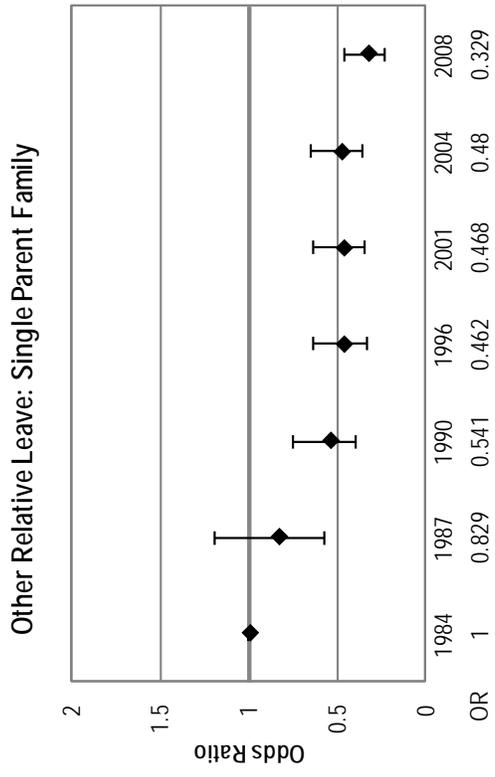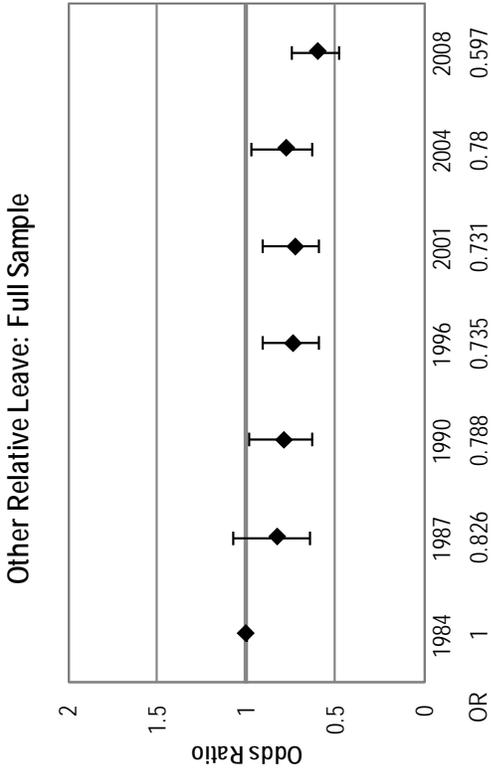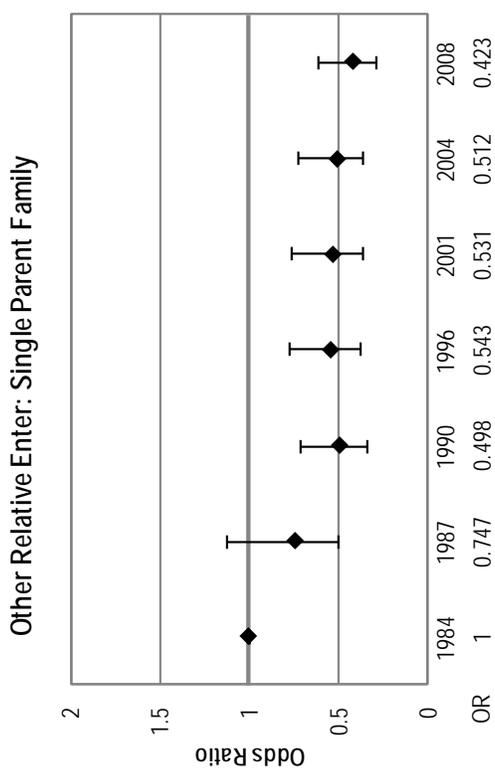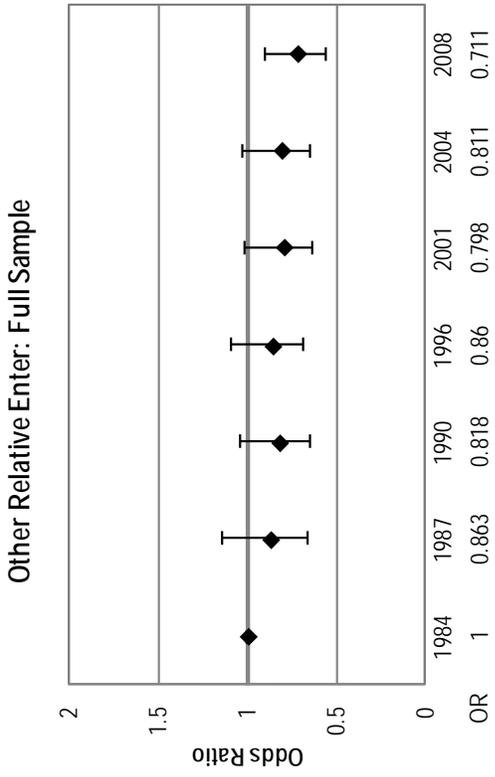
Figure 1.6. Odds Ratios across Panels for Other Relative Exit and Entry, for Full Sample and Children in Single Parent Families
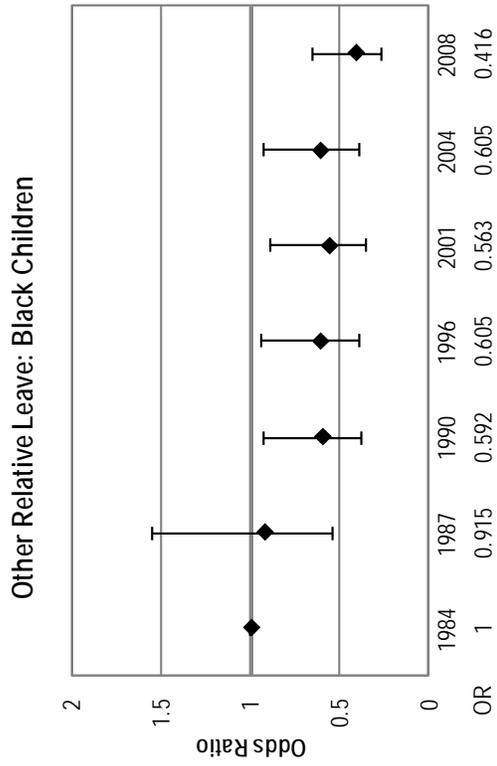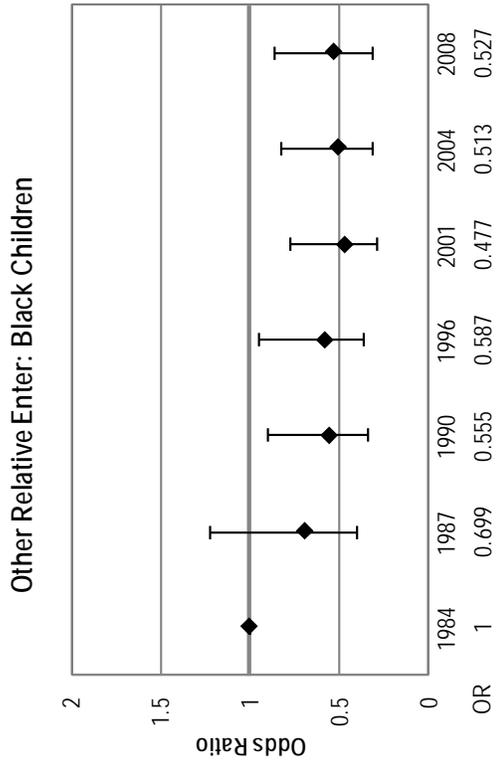
Figure 1.7. Odds Ratios across Panels for Other Relative Exit and Entry for Black Children

There are no significant time trends in children's exposure to the entry or exit of other relatives among children starting in two parent families. The odds ratios suggest that children of single parents in more recent SIPP panels have a lower likelihood of experiencing both the entry and exit of other relatives than in the 1984 panel. As shown in Figure 1.6, the odds ratios for children starting in single parent families are higher in the 1980s than they are in the 1990s and 2000s.

Among white and Hispanic children there do not appear to be clear time trends in father entry or exit or the movement of other relatives in and out of the household. There are, however, significant differences by panel among black children in exposure to other relatives leaving or joining the household, as shown in Figure 1.7. The odds ratios in the later panels are significantly lower than 1 for both other relative exit and other relative entry, suggesting that black children in more recent panels have a lower likelihood of experiencing changes in extended family members than did black children in the 1980s.

Overall, these results suggest that children in the more recent SIPP panels are exposed to fewer changes in household composition than children in the earliest SIPP panels. This is particularly evident among children who begin the panel in single parent homes and among black children, two groups that are, on average, more disadvantaged than children who live with two parents and white children. To the extent that changes in household composition are disruptive and harmful to children, having fewer of them in the more recent cohorts is beneficial, especially if fewer children in traditionally more disadvantaged groups are exposed to negative events.

Discussion

      Demographers have documented changes in marriage, divorce, childbearing and

cohabitation occurring over the last 30 years, the same period covered by my analysis of

children's exposure to household change. Most of the change documented has focused on unions

and nuclear family arrangements – later age at marriage, more marriages preceded by

cohabitation, more instability in cohabiting unions, and stable overall divorce rates (Guzzo 2014;

Kennedy and Ruggles 2014; Kreider and Ellis 2011) – whereas my findings center on the role

that non-parent, non-sibling relatives play in household composition and change. The results

presented above support the argument that research on family complexity and instability should

take a more holistic view of family instability by incorporating measures of household transitions

beyond parents and their romantic partners. The cumulative proportion of children exposed to

gaining or losing a household member is much higher than the cumulative proportion of children

whose father or mother enters or leaves the household. A substantial proportion of children

experience the entry of cousins, aunts, uncles, and grandparents into their households even over a

relatively short time period. These changes are rarely fully accounted for in research on family

instability, even though extended family and non-relative coresidence and transitions are

associated with child cognitive outcomes and other measures of wellbeing (Chase-Lansdale,

Brooks-Gunn, and Zamsky 1994; Mollborn, Fomby, and Dennis 2012; Mutchler and Baker

2009). Coresident relatives and non-relatives may contribute resources to a child's household or

may detract from parental resources and attention available to children, and the disruption of the

change itself may matter for children's wellbeing.

Differences by Subgroup

My results further show that children's exposure to changes in household composition differs across racial and ethnic groups and family structure. Although there is little difference by race/ethnicity in children's experience of parental figures entering and exiting the household, a greater share of black and Hispanic children than white children experience the entry or exit of a non-parent, non-sibling relative from their household. Thus, research looking only at changes in parents and their romantic partners may not uncover differences among white, black, and Hispanic children that a broader conceptualization of household instability would reveal. These differences in the quantity and quality of household change could potentially explain differences in the effects of household instability on children's outcomes by race and ethnicity.

Children who live with one parent or no parents are disproportionately exposed to changes in household composition compared to children who live with two parents. This finding is consistent with research that documents the higher levels of family instability among children born to unmarried mothers (Aquilino 1996; Beck et al. 2010; McLanahan 2011), though much of this research focuses on changes in parental figures and mothers' relationship partners. I show that the instability in these households extends to other relatives as well. Children who start out in households conventionally viewed as disadvantaged, those with only one parent or no parents present, are disproportionately exposed to changes in household composition compared to children who start out in more advantaged households. To the extent that these changes have negative consequences for children's outcomes or other measures of wellbeing, it will be important to consider them as yet another dimension of disadvantage for children already at risk of worse outcomes.

Trends over Time

Overall, fewer children in the 1990s and 2000s than in the 1980s were exposed to changes in household composition. This may seem inconsistent with the overall trends of later age at marriage, increased cohabitation, and stable divorce rates documented by demographers, yet a narrow focus on households with children and those likely to have children shows more stability. Cohabiting parents have more stable unions now than in the past (Musick and Michelmore 2015) and divorce rates are declining among younger couples compared to older couples (Kennedy and Ruggles 2014).

My aggregate finding of less instability, however, may mask divergent trends for different subgroups. For children starting with single parents and among black children in general, trends are toward greater household stability, in particular lower exposure to father entrances and exits or entrances by non-sibling relatives. These findings could reflect an increasing preference among single parent families for living alone with one's children, rather than relying on extended family, multigenerational and doubled-up household formats for support (Edin and Kefalas 2005; Harvey 2015), but more research is needed to test this hypothesis. Fewer changes among household members may be beneficial for children in these groups who, on average, face greater disadvantages in many domains than children living with two parents and white children. My descriptive statistics do not show dramatic changes over time in the proportion of the sample living in two parent, single parent and no parent households, yet future research should simultaneously account for changing rates and changing composition to explain or decompose the aggregate and subgroup trends I observe here.

This study is not without limitations. For the majority of my analyses I determine household relationships using the variable indicating every household member's relationship to

the household reference person, typically the head of household. This variable is available in every wave of every SIPP panel and is coded consistently across panels. As a result, my relationship assignment is somewhat coarse. For example, if the variable indicates that the focal child is the child of the reference person and there is a household member who is an "other relative" of the household reference person, I assign this "other relative" as an "other relative" of the child. For some analyses it may be useful to know the precise relationship of this person to the child, perhaps a grandparent, aunt, uncle or cousin, but it is not always possible to make that determination without more detail. To examine these other relative relationships in more detail for my description of the extended family members who live with children, I used the household relationships section of the SIPP topical modules, which provide the relationship of every person in the household to every other person in the household. These detailed household relationships, however, are available at only one wave of every panel and are insufficient for documenting relationships in households across waves, especially given my interest in identifying the relationship of the individuals entering and exiting the household, who may not be present during the wave at which the relationship matrix is administered.

This analysis does not account for the entry and exit of children's siblings, step-siblings and half-siblings into and out of their households. I can determine when a child gains or loses a sibling, but distinguishing among full, step- and half-siblings is difficult to accomplish without a complete household relationship matrix at each survey wave. Supplemental analyses based on the age of siblings entering and leaving children's households reveal that over two years nine percent of children experience the addition of a sibling under age one to their household and 3.5 percent experience the departure of a sibling age 17 or older. Under two percent of children experience a change in a sibling ages one to 16, the type of change more likely to be associated

with step-siblings. Recent research on family complexity has focused on step- and half-siblings as a source of complexity and documents that this type of family complexity is concentrated among the most disadvantaged families (Manning, Brown, and Stykes 2014). Sibling complexity could be an important source of household instability for children in addition to the types of changes I focus on here, and a more complete characterization of the household changes to which children are exposed would include all individuals entering and exiting children's homes, regardless of their age or relation to the child.

The finding that a substantial proportion of children experience non-parental changes in household composition, and that non-white children and children starting in single parent and no parent households are disproportionately exposed to these changes, should stimulate further research on the consequences of these changes for child development and wellbeing. My comparison of the four-month and annual measures of household composition and change (see Appendix B) suggests that future research using surveys with annual or less frequent recording of household composition may miss some of the household changes to which children are exposed. Future research should seek to determine the consequences of short- and long-term household changes, acknowledging that the frequency at which household rosters are documented may limit the detail and precision of any measure of disruption. Family complexity and instability is an important area of research that has received much recent attention. My results show the necessity of broadening the definition of family instability to include other individuals present in children's households. This broader definition also shifts the focus from family instability to household complexity, which better captures the changes in developmental environments to which children are exposed.

The Effect of Changes in Household Composition on Children's Educational Attainment

Family structure, especially whether children live with a single parent or two parents, has long been of interest to researchers estimating the effects of family characteristics on children's outcomes. This research tradition generally concludes that children growing up with a single parent are at a disadvantage in many domains relative to children who live with two parents while growing up (McLanahan and Sandefur 1994). More recently, research in family sociology has shifted to acknowledge the dynamic nature of family structure, as children who end up living with single parents often experienced the departure of a parent from a two-parent home and may also experience the arrival of a new parental figure (Beck at al. 2010; Cavanagh 2008; McLanahan 2011; Mitchell 2013). This new focus on instability has argued that it is disruption and change in family structure rather than the type of family structure in which children live that is detrimental to their wellbeing. Research on family instability thus tends to define instability in terms of changes in parental romantic relationships: dissolution, re-partnering, or churning among parents and their partners.

In this paper, I argue for the substantive importance of changes in household composition beyond parents and parents' partners as an indicator of volatility in children's lives. While there is a substantial literature documenting the effects of parental divorce and re-partnering on children's outcomes, relatively few studies have considered whether changes in household composition beyond parents are consequential for children's wellbeing. To overcome this limitation, I use data from the Panel Study of Income Dynamics (PSID) to track changes in

children's households, among relatives and non-relatives, during childhood and adolescence and estimate the effect of these changes on their educational attainment, specifically their likelihood of graduating from high school.

Using inverse probability of treatment weighting and marginal structural models that facilitate the estimation of causal effects, I find that entries into and exits from children's households of parents and non-parents are consequential for children's educational attainment. Children who experience a change among parents or a change among non-parent, non-sibling household members are both less likely to graduate from high school compared to children who experience no such changes in household composition, net of controls for family structure. My findings also demonstrate that the effect of changes in household composition differs by race, with the negative effects limited to white children. Among black children, changes in household composition do not significantly affect the probability of high school graduation. I conclude the paper with suggestions for future research, including encouraging future research on family instability to pursue a more expansive definition of instability beyond parents and their partners, better reflecting the changes in households to which children are exposed.

Background and Motivation

Two strands of research motivate this study. The first is the literature on family instability, which generally finds that changes in family structure are disruptive to children's lives. This literature almost exclusively considers the role of parental divorce and repartnering for children's short- and long-term outcomes, failing to consider other changes in children's households and living arrangements. The second strand of research explores multigenerational and extended family households, documenting children's exposure to these living arrangements

and the associations between living in a multigenerational or extended family household and children's outcomes. The studies in this line of research, however, mostly conceptualize multigenerational and extended family households as a static characteristic and often fail to acknowledge the instability inherent in these arrangements. I consider children's exposure to changes in household composition that result from parents and non-parents leaving or entering their households.

Parental Divorce and Repartnering

Prior research, focused on children's exposure to changes in their coresident parents, finds that experiencing parental divorce is associated with negative outcomes in childhood, adolescence, and across generations. Children whose parents divorce while they are elementary school have lower math and reading scores, worse social skills, and more internalizing and externalizing behavior, on average, than children who do not experience parental divorce (Kim 2011). Experiencing parental divorce as a child is associated with early home-leaving and non-marital childbearing as an adolescent (Cherlin, Kiernan, and Chase-Lansdale 1995). The negative consequences of divorce may extend across generations as divorce in one generation is associated with lower educational attainment, marital discord, and weaker relationships with parents in future generations (Amato and Cheadle 2005). These studies are focused on identifying the effect of experiencing one change in family structure on later outcomes for children.

Other research considers family structure as a dynamic process unfolding over childhood and adolescence and potentially involving multiple transitions among parents and parental figures. Studies of the cumulative effects of family structure changes show that repeated

transitions in family structures are particularly harmful to children's development and wellbeing. Among younger children, exposure to repeated changes in family structure is associated with lower school engagement, externalizing behavior, and negative relationships with teachers and peers (Cavanagh and Huston 2006; Lee and McLanahan 2015; Fomby and Cherlin 2007; Fomby and Osborne 2010; McLanahan 2011). Experiencing multiple transitions in family structure is associated with lower educational attainment, early home leaving, non-marital childbearing, depression, delinquency, and drug use among adolescents (Aquilino 1996; Brown 2006; Cavanagh 2008; Wu 1996). Research finding a negative effect of family structure transitions adds to our understanding about prior findings on the negative effect of family structure itself (McLanahan and Sandefur 1994) as the more recent research suggests that it is the disruptions in family structure associated with single parenthood that are consequential for children rather than the status of living with a single parent.

Multigenerational and Extended Families

A somewhat separate literature considers multigenerational and extended family households and the association between these types of family structures and child's outcomes. Living in multigenerational households is more common among single mothers than among two-parent families (Cohen and Casper 2002; Pilkauskas 2012) and prior research on multigenerational and extended family households acknowledges the role these multi-adult households can play for families in need of economic or other support (Bengtson 2001). Infants living with grandparents in a variety of family structures (married parents, cohabiting parents, single parents) generally score better on cognitive tests than infants living in the same family structures without grandparents (Sun and Li 2014). Among older children, those living with

never-married single mothers and grandparents are more likely to graduate from high school, more likely to enroll in college, and less likely to smoke or drink than youth living with two married parents, cohabiting parents, or single mothers alone (DeLiere and Kalil 2002). Research comparing children living with single parents to children living with single parents and grandparents shows that children living with grandparents may have access to more economic resources than their counterparts living with single mothers (Mutchler and Baker 2009), but that they also may be exposed to lower parenting quality, from parents and grandparents, and more familial conflict (Chase-Lansdale, Brooks Gunn, and Zamsky 1994; Harvey 2015). Thus, coresidence with grandparents can be positive or negative for children depending on the circumstances.

Just as scholars of family instability have come to understand family structure as a dynamic rather than a static characteristic, multigenerational and doubled-up households are characterized by a great deal of instability (Pilkauskas 2012). In one study over 60 percent of multigenerational households experienced some change in composition within one year and over 90 percent of such households changed within five years (Glick and Van Hook 2011). These rates of change are substantially higher than the rates of change experienced by children living with parents alone.

Moving beyond point-in-time coresidence with grandparents, some research has estimated the short-term consequences for children of instability among grandparents. In some cases changes in household composition involving grandparents or other adults appear to be beneficial for children: children of single mothers who gain a coresident grandparent or other adult household member between the ages of nine months and two years had a higher rate of cognitive growth than did children living in many stable family structures (Sun and Li 2014).

Transitions of grandparents and other adults into and out of a child's household are associated with early childhood cognitive outcomes independent of parental relationship transitions, but these associations vary by race. Changes among grandparents or extended family members are negatively associated with cognitive outcomes among white and African American children, but this type of instability is positively associated with cognitive outcomes among Latino children (Mollborn, Fomby, and Dennis 2012). These studies consider only short-term, early childhood cognitive outcomes and the effect of household transitions on longer-term outcomes, like the one I consider here, may follow a different pattern.

Together, these three lines of research point to three general conclusions that motivate the analysis in this study. First, parental relationship dissolution and repartnering matter for children's outcomes. Children's exposure to changes in family structure involving a parental figure are generally associated with negative cognitive, emotional, and behavioral outcomes. Second, living in an extended family or multigenerational household is associated with the resources available to children at home. These can be economic resources, if doubling up is a strategy for addressing low incomes and high housing costs, or parenting and supervisory resources, if grandparents or other adults provide child care. Third, children living in multigenerational and extended family households likely experience many changes in household composition given the inherent instability of these arrangements.

Because there is evidence that these changes are associated with children's short-term outcomes, research on children's longer-term outcomes should better incorporate exposure to changes in household composition into measures of disruptions in children's developmental environments. For example, research on child outcomes should account for the frequent transitions experienced by children living in doubled-up and extended family households,

integrating extended family and non-relative instability into the literature focused on changes among parents and their partners. If changes involving extended family members and non-relatives matter for children's outcomes similar to how changes among parents in the household are consequential for children's wellbeing, then research that fails to consider the broader household roster is potentially missing changes that could be important for predicting children's success in school and beyond and underestimating the total costs to children of instability in their residential arrangements.

Differences by Race and Ethnicity

Research endeavoring to estimate the effect of changes in household composition on children's outcomes must also consider heterogeneity by race and ethnicity. The distribution of different types of family structures differs by race, with much higher shares of black and Hispanic children living with a single parent compared to white and Asian children. Fully 55 percent of black children and 31 percent of Hispanic children lived with a single parent in 2012 compared to only 21 percent of non-Hispanic white and 13 percent of Asian children (Vespa, Lewis, and Kreider 2013). Multigenerational and extended family households represent a relatively small share of family households overall, but the share differs by race and ethnicity. In 2012, three percent of white-headed family households were multigenerational compared to six percent of Asian-headed family households and eight percent of households with a black or Hispanic head (Vespa, Lewis, and Kreider 2013).

Multigenerational households have high rates of instability, so differences in the share of children exposed to multigenerational households by race and ethnicity could also mean that children in different racial and ethnic groups are exposed to different rates of changes in

household composition. The differential rates of multigenerational households suggest that exposure to changes in household composition may be less common among whites than it is among blacks. If living in multigenerational households is more common or having an extended family member enter or leave a child's household is a more frequent event among certain groups, then the effects of these changes may differ by race and ethnicity as well. If changes in household composition are a less normative experience among white children, these changes could be more disruptive in their lives. They may feel more stigma about a parental divorce or an uncle coming to live with them, for example, and they could have fewer social and emotional resources to draw on to adjust to the change. Further, if black children are exposed to altogether more changes, the effect of an individual leaving a child's household could be counteracted by a different individual joining the household. If a child's parents divorce and his father leaves the household but his grandmother later joins the household, a negative effect of the first change could be balanced by a positive effect of the second. The analysis in Chapter 1 shows that a higher proportion of black children are exposed to changes in household composition. This analysis estimates whether there are different effects of these changes by race.

Prior research more narrowly focused on parental transitions suggests that the effects of transitions may differ by race. Repeated family structure transitions are associated with higher externalizing scores among white children, but not black children (Fomby and Cherlin 2007), and they are more strongly associated with earlier onset of sexual activity among white adolescents than among black adolescents (Fomby, Mollborn, and Sennott 2010). Changes among coresident extended family members in early childhood has negative associations with short-term cognitive outcomes among white and African American children and positive associations with the same outcomes among Latino children (Mollborn, Fomby, and Dennis

2012). Mollborn et al. (2012) consider transitions among parents, grandparents, and other adult relatives, but focus on short-term cognitive outcomes rather than the longer-term outcome of high school graduation that I predict here. This paper addresses the omission of non-parent changes in household composition in this literature. By the authors' own admission, however, the short-term cognitive outcome they examine has only a tenuous connection to longer-term outcomes. In addition, they use number of adults in the household across waves to identify household change. If one adult left and other in the same category joined they would miss these changes. Finally, they make no attempt to address selection bias with any causal inference technique.

I use a method designed to facilitate causal inference to estimate the effect of exposure to changes in household composition during childhood on a longer-term outcome: high school graduation. To accomplish this, I measure changes in parents and other members of children's households over 15 years and categorize children by their exposure to different types of changes. I show that the primary focus of prior research on parents and parents' romantic partners misses a great deal of the changes to which children are exposed and I argue that these changes in household composition reflect volatility in children's developmental contexts that could have lasting consequences.

Importance of Education as an Outcome

High school graduation is an important outcome in its own right and also predictive of many other demographic and socio-economic characteristics. Completing high school is important for success in the labor market, as individuals who drop out of high school prior to graduating are more likely to be unemployed than their counterparts who graduated (Rumberger

1987). High school graduation or an equivalency degree is necessary for post-secondary educational attainment, which is in turn associated with better labor market outcomes. Increased schooling is also associated with income earned and wealth acquired over time (Oreopoulous 2007; Rumberger 1987). Beyond employment and income, educational attainment is associated with better health (Freudenberg and Ruglis 2007). Furthermore, education is associated with family formation and child-bearing outcomes. Educational attainment is positively associated with marriage (Copen et al. 2012; Goldstein and Kenny 2001); among women who do marry, women with lower levels of education have higher dissolution rates than do women with higher educational attainment (Martin 2006). Non-marital childbearing is more common among women who have less than a high school education than it is among women with more education (Upchurch, Lillard, and Panis 2002).

High school graduation is thus important as a measure of education and as an indicator of the likelihood of other later-life demographic and socioeconomic characteristics and outcomes. I hypothesize that changes among household members including parents, extended family members, and non-relatives reduces the likelihood of high school graduation. Changes among household members affect material and other resources available to children; more income-earning adults could provide the household with more money for food, school supplies, and extracurricular activities, whereas fewer income-earning household members could divert resources away from non-critical expenses. Adding individuals to an already full house could result in crowding, which is associated with increased externalizing behavior and worse health among children (Solari and Mare 2012), intermediate outcomes that could affect longer-term educational attainment. Supervision is another potential mechanism connecting changes in household composition to high school graduation. Children who lose adults at home may have

48

fewer people keeping track of time spent on homework and extracurricular activities, and a lack

of supervision may provide opportunities for delinquent behavior. Beyond material resources and

supervision, changes in household composition are disruptive and could be stressful for children,

as household roles must change to adapt to more or fewer individuals present.

In this chapter, I connect the literatures on family instability and extended family

households and test the hypothesis that changes among non-parent household members affect

children's longer-term outcomes, namely their educational attainment. In addition to advancing

theory on family and household instability I address methodological limitations of prior research

through a causal inference technique employing inverse probability of treatment weighting and

marginal structural models.

Data

I use data from the PSID to measure how changes in household composition experienced

during childhood and adolescence affect the likelihood of high school graduation. The PSID

began in 1968 as a nationally representative sample of approximately 4,800 families containing

over 18,000 individuals. The survey has interviewed these families and their descendants since

1968, annually between 1968 and 1997, and biennially from 1997 until 2013. The PSID provides

a large nationally representative survey that includes many waves, following children from the

time they are very young until they transition to adulthood and form their own households. I use

data from the 1968 through the 2013 waves of the study. I construct complete household rosters

at each wave of data collection for the 5,024 children who are continuously present in a

responding PSID household from age 1 to 15 years. My outcome models are limited to the 3,763

individuals who are present in or reported by a PSID household at age 20, when I measure

educational attainment, and for whom I have complete household roster data from ages 1 to 15. My analyses are weighted to account for sample selection and attrition.

This analysis relies on identifying how people entering and leaving children's households are related to those children. Constructing household rosters and identifying every household member's relationship to every other household member is a laborious process. The PSID does not include a household relationship matrix that indicates each household member's relationship to all other members. Rather, it includes a variable indicating every household member's relationship to the head of household. The individual-level data also include parent pointers if an individual's mother or father resides in the same household. I use the relationship to head and parent pointer variables to identify relationships between children and heads of household and to infer relationships between children and other household members. In the 1968 survey wave the relationship to head variable has eight values including head (self), wife, child, sibling, parent, grandchild or other child relative, other including adult relatives, and spouse of head who moved out or died in the year prior to the interview. Coding relationships to children in the household entails logically inferring relationships based on the child's relationship to the head of household. The first step is using the parent pointers to identify children's coresident mothers and fathers. Once parents are assigned, I use the relationship to head variable to link individuals. For example, if Household Member 4 is listed as the head's brother and the focal child is listed as the head's child, then I assume that Household Member 4 is the child's uncle. Ultimately, I categorize household members into four groups representing different relationships to children: parents, siblings, non-parent, non-sibling relatives (other relatives), and non-relatives.

Over time, the relationship to head variable expanded to include many additional values, allowing more specific relationships to be identified. Starting in the 1983 survey, the relationship

to head variable includes 33 values capturing members of the head's immediate family, extended family, in-laws, cohabiting partners, and non-relatives. Later years of the survey also include parent pointers so the first step in identifying children's relationships to other household members remains the same. Once parents are identified, I use the relationship to head variable in the later years of the survey in the same way I use it for the earlier years. The main difference in the later years is that it is possible to more precisely identify children's relationships to in-laws and cohabiting partners of the head of household. After assigning specific relationships between children and household members I collapse these relationships into the same four categories of parents, siblings, other relatives, and non-relatives. In general, I categorize in-laws as other relatives and cohabiting partners and their family members as non-relatives (see Appendix C for relationship assignment to categories).[1]

My analysis using inverse probability of treatment weighting and marginal structural models also relies on a number of covariates describing the child, head of household, and characteristics of the household at baseline and across waves because these characteristics are related to both children's educational outcomes and the likelihood of experiencing changes in household composition across time. My model predicting high school graduation accounts for time-varying confounding between covariates and household composition and takes advantage of the longitudinal nature of the PSID. The time-invariant characteristics I include are indicators of

---

[1] I categorize cohabiting partners of parents as non-relatives rather than as parents because cohabiting partners are not classified consistently across waves of the PSID. Before 1983, they appear in the survey as non-relatives. Even among children for whom I can always distinguish cohabiting partners of parents from other non-relatives (those entering the survey in 1983 or after), only nine percent of children who experienced changes among non-parent, non-sibling household members experienced changes only among cohabiting partners of parents. Thus, only 52 of 558 children would be classified differently if I had a separate category for cohabiting partners of parents.

the child's sex (female=1), whether the child lived with married parents at baseline, and the baseline head of household's race or ethnicity (indicators for black, Hispanic, and other race with white as the reference category). Baseline, in this instance, is the year of the child's entry into the survey, which happens around the time of the child's birth, ranging from 1968 to 1997.[2] I measure a number of baseline and time-varying characteristics of heads of household. These include the head's educational attainment (indicators for less than high school, some college, bachelor's degree or more, with high school diploma as the reference category), employment status (indicators for unemployed and retired or disabled, with employed as reference), and marital status (single, widowed/divorced/separated, married as reference). I also include a collection of baseline and time-varying household-level characteristics: whether the home is owned, rented, or neither; an indicator for household income falling below the poverty line, household size, and number of children in the household.

Methods

My goal is to estimate the effect of changes in household composition throughout childhood and adolescence on the probability of high school graduation. Conventional regression methods are not appropriate for this type of research question because they do not allow me to account for time-varying confounding between my main independent variable, changes in household composition, and other predictors of high school graduation. Time-varying household characteristics like poverty status and homeownership predict changes in household composition

---

[2] It is possible for me to observe children who enter the survey between 1968 and 1982, and remain in the survey until age 15, every year given the PSID's annual data collection from 1968 until 1997. I include in my sample children who enter the survey after 1982 and remain in the survey until age 15, but I do not observe them every year. I account for variation in the length of time between observations both within children and between children in my prediction models.

as well as the likelihood of high school graduation. If I ignore the possibility of confounding and do not control for time-varying covariates, I may overestimate the effect of changes in household composition by attributing any independent effect of poverty status and homeownership on high school graduation to changes in household composition. For example, living in a household with income below the poverty line during childhood is associated with a lower likelihood of graduating from high school and a higher likelihood of experiencing changes in household composition independent of other characteristics. If I do not account for time-varying poverty status during childhood and adolescence in my models estimating the effect of household composition on high school graduation I would attribute any independent effect of poverty on high school graduation to changes in household composition. Conversely, if I control for time-varying covariates like poverty status and homeownership, I fail to capture the indirect effect of changes in household composition on high school graduation that operate through poverty status and homeownership.

One solution to this dilemma is to use marginal structural models and inverse probability of treatment (IPT) weighting to explicitly account for time-varying covariates (Robins, Hernan, and Brumback 2000). These models allow household characteristics to mediate the relationship between changes in household composition and educational attainment while at the same time adjusting for potential confounding resulting from selection bias at each wave of data collection. In essence, the models adjust for these confounding factors that occur *prior* to the current household composition (and therefore may be determinants of current household composition) and does not adjust for the values of the same confounders that come *after* the current household composition (and therefore may be its consequences). As in standard regression models, marginal structural models using IPT weighting assume that there is no unmeasured confounding

conditional on the covariates included in the prediction and outcome models (Robins, Hernan, and Brumback 2000).

The first step in this process is creating IPT weights. I use each child's exposure to household composition change in the prior wave, baseline covariates, and prior wave time-varying covariates to predict the probability of the observed type of household change the child experienced in the current wave. Using four separate logistic regression models, I predict the probability of experiencing one of four distinct types of household change: change in a parental figure, change in a non-parent, non-sibling household member, joint change in both a parent and other household member, and no change. I take the inverse of the predicted probability of the observed household change and use that to weight each child's contribution to a pseudo-population in which household change in each period is independent of prior confounding variables, making it unnecessary to control for time-varying confounders in the final regression model, because they are accounted for by the weight. I use a stabilized IPT weight to achieve narrower confidence intervals because IPT weights tend to be highly variable (Robins, Hernan, and Brumback 2000).[3] To create a stabilized weight I predict the probability of the observed type of household change experienced by each child using only exposure to household change in the prior wave and time-invariant baseline covariates, omitting time-varying covariates from the prior wave. I calculate the stabilized weight by multiplying this second predicted probability by the inverse of the first predicted probability. This is shown in Equation 2.1 below:

Eq. 2.1: $sw_i = \prod_{t=1}^{19} \frac{P(E_t=e_{ti}|\bar{E}_{t-1}=\bar{e}_{(t-1)i},X_0=x_0)}{P(E_t=e_{ti}|\bar{E}_{t-1}=\bar{e}_{(t-1)i},\bar{X}_{t-1}=\bar{x}_{(t-1)i})}$

---

[3] The unstabilized IPT weights I estimate range from 1.16 to 3.43 x 10^{15} whereas the stabilized weights range from 0.0008 to 2.58 x 10^8. This range demonstrates that the stabilized weights include both very small and very large numbers so for analysis I truncate the weights at the 5th and 95th percentile, resulting in a stabilized weight that ranges from 0.14 to 2.25.

In each period (t) I estimate the probability of the actual type of household change experienced by the child (e_{ti}), given the history of both household changes ($\bar{e}_{(t-1)i}$) and other confounders, such as poverty status and homeownership in the prior wave ($\bar{x}_{(t-1)i}$). Once I have a predicted probability from each wave that the child is observed, I multiply these probabilities across waves to create the final stabilized IPT weight. The models used to predict changes in household composition and create the IPT weights include baseline characteristics of the child, household, and head of household. Child-specific baseline characteristics include indicators for sex and whether the child lives with married parents. For the head of household, I control for sex, race/ethnicity, age, educational attainment, employment status, and marital status. I also include a number of household-level baseline characteristics: whether the home is owned, rented, or neither; an indicator for household income falling below the poverty line, household size, and number of children in the household.

My unit of analysis is an individual child, and characteristics of his or her household could change substantially across waves as the composition of his or her household changes across waves. Therefore, to predict household change experienced before the current wave, I include prior wave time-varying measures of many of the same characteristics measured and included at baseline: head sex, age, education, employment, and marital status; and household size, homeownership and poverty status, number of children, and age of youngest child. I include baseline but not time-varying indicators for household head's race/ethnicity because there is very little variation across waves. Even if the household head changes because the original head moves out or the child lives with a different family member, the race/ethnicity of the head is nearly constant.

Once I have constructed the stabilized IPT weight, I use this weight to run a weighted

logistic regression model with high school graduation as the outcome, shown in Equation 2.2,

below:

Eq. 2.2: $logit_{IPT-weighted}(P(Y_i = 1)) = \alpha + \gamma_1 \text{pc} + \gamma_2 \text{oc} + \gamma_3 \text{jc} + x_0 \boldsymbol{\beta}$

I categorize children by the type of household changes they experienced from ages 0 to 15:

change among parental figures only (pc), change among non-parent, non-sibling household

members only (oc), changes among both parental and other household members (jc), and no such

changes. My main predictor variables are indicators for membership in the first three categories

with no changes as the reference category. Coefficients for these variables represent estimated

causal effects of exposure to household changes on high school graduation, conditional on the

assumption that all confounders are measured and included in the model. In addition to these

three dummy variables my weighted logistic model controls for the baseline variables from the

prediction model (x_0) because using stabilized weights reintroduces correlation between the

household composition variables and the baseline covariates. These baseline covariates include

the first year the child is observed in the PSID, child sex, whether the child lives with married

parents; age, sex, race/ethnicity, education, employment, and marital status of household head;

and housing tenure, poverty status, number of children and overall size of the household.

Results

Table 2.1 presents survey weighted baseline descriptive statistics for the sample of

individuals for whom I observe the outcome of high school graduation, pooled across all waves

of the PSID. The table presents characteristics of the individuals' households and heads of

household, their parents, and themselves. Just over half of the children in the sample are female,

80 percent lived with married parents at baseline (soon after the child's birth), and 82 percent of

them graduated from high school. Of the approximately 3,700 individuals in the analytic sample,

15 percent lived in a household headed by a female at baseline. Nearly 80 percent lived with

white heads of household while 17 percent lived with black heads of household.[4] Over half, 54

percent, lived in households owned by the household head. At baseline about 13 percent of the

individuals had household incomes below the poverty line. The average household size was just

over four people.

---

[4] The proportion of my sample living with a black head of household may seem high since the weighted PSID sample is nationally representative, but a higher proportion of minor children is black compared to the population as a whole and my sample includes only children under age 15. In all years from 1970-2010 the decennial U.S. Census reports that approximately 15 percent of minor children in the United States were black.

Table 2.1. Descriptive Statistics: Household Change

	Mean	SD
Child Sex (female=1)	0.51	
Household Change Category		
Change in Parents	0.15	
Change in Other Household Members	0.17	
Joint Change Parents and Other Household Members	0.21	
No Change	0.47	
Child Graduated from High School	0.82	
Baseline Characteristics		
Child Lives with Married Parents	0.80	
<u>Characteristics of Head of Household</u>		
Sex (female=1)	0.15	
Age	30.66	8.63
Race/Ethnicity		
White	0.79	
Black	0.17	
Hispanic	0.04	
Other	0.01	
Education		
Less Than High School	0.26	
High School Diploma	0.39	
Some College	0.19	
Bachelors or More	0.15	
Employment		
Employed	0.93	
Unemployed	0.04	
Retired/Disabled	0.02	
Marital Status		
Married	0.84	
Single	0.08	
Widowed, Divorced, Separated	0.08	
<u>Characteristics of Household</u>		
Housing Tenure		
Owned	0.54	
Rented	0.41	
Neither Owned nor Rented	0.06	
Income below Poverty Line	0.13	
Household Size	4.36	1.74
Number of Children in Household	2.22	1.39
First Year Child Observed in PSID	1980	
Observations	3,763	

Table 2.1 also presents statistics on exposure to household change across childhood and adolescence. I categorized children into four mutually exclusive categories based on their experiences of household change. Nearly half (47 percent) of the children in the sample experienced no change among a parent or a non-parent, non-sibling household member in the first 15 years they were observed by the PSID. Fifteen percent experienced a parent enter or leave their household but no changes among other relatives or non-relatives and 17 percent experienced a change among a non-parent, non-sibling household member, but not a parent. The non-parent, non-sibling household members include other relatives like grandparents, aunts, uncles, and cousins, and also include non-relatives such as cohabiting partners of the household head, friends, or boarders. The remaining 21 percent of children in the sample experienced a change among parents and other household members before age 15. These two changes could have happened simultaneously in the same wave of the survey or they could be separated by many years and waves. This fourth category includes children who have experienced two different types of changes in their household composition.

Table 2.2 presents the results from the models predicting household change at each wave and shows the determinants of household instability. The coefficients presented in the first column, for example, can be interpreted as the change in the log odds of experiencing changes in parental figures in a given year, compared to all the other status groups: experiencing changes in other household members, change among both parents and other household members, or no changes, with a one-unit change in the predictor variable. The top part of the table presents coefficients for baseline characteristics and the bottom part of the table presents coefficients for prior wave characteristics. Living with married parents at baseline is associated with more stability in household composition during childhood. Living in a household at baseline with a

non-white or unemployed head is associated with less stability over time. Having a less educated head of household is associated with changes among non-parent household members, while more educated heads are associated with more stability in household composition. Compared to married heads of household, living with an unmarried head of household is associated with less stability. Living in a rented home is associated with more changes in parents, non-parent household members, and joint changes in both parents and other household members compared to children who live in a home that is owned. Finally, experiencing a change in household composition at one wave is highly predictive of experiencing the same type of change at the subsequent wave.

Table 2.2. Prediction Model for Household Change

	Parent Change	Other Change	Joint Change	No Change
Child Sex (female=1)	0.097	-0.035	0.06	-0.022
	(0.065)	(0.057)	(0.115)	(0.045)
Baseline Characteristics				
Child Lives with Married Parents	-0.659***	-0.266	-1.745***	0.710***
	(0.162)	(0.139)	(0.309)	(0.109)
Characteristics of Head of Household				
Sex (female=1)	0.016	0.176	0.144	-0.031
	(0.266)	(0.159)	(0.329)	(0.182)
Age	-0.009	-0.004	-0.036***	0.009*
	(0.007)	(0.005)	(0.010)	(0.004)
Race/Ethnicity (reference = White)				
Black	-0.12	0.529***	-0.302	-0.210***
	(0.101)	(0.075)	(0.160)	(0.061)
Hispanic	-0.158	0.531***	0.012	-0.255*
	(0.168)	(0.124)	(0.262)	(0.104)
Other	0.587**	0.591*	0.466	-0.787***
	(0.200)	(0.281)	(0.555)	(0.227)
Education (reference = High School Diploma)				
Less Than High School	-0.111	0.168	0.24	-0.107
	(0.115)	(0.093)	(0.182)	(0.073)
Some College	-0.235	0.074	-0.129	0.036
	(0.120)	(0.118)	(0.233)	(0.085)
Bachelors or More	0.09	-0.082	-0.144	-0.028
	(0.227)	(0.167)	(0.571)	(0.140)
Employment (reference = Employed)				
Unemployed	0.242*	0.059	-0.473	-0.046
	(0.123)	(0.129)	(0.281)	(0.103)
Retired/Disabled	0.068	-0.198	0.249	0.138
	(0.279)	(0.143)	(0.351)	(0.155)
Marital Status (reference = Married)				
Single	-0.263	-0.131	-1.069**	0.338
	(0.289)	(0.170)	(0.351)	(0.191)
Widowed, Divorced, Separated	-0.406	-0.387*	-0.907**	0.557**
	(0.285)	(0.154)	(0.318)	(0.175)
Characteristics of Household				
Housing Tenure (reference = Owned)				
Rented	0.154	-0.079	-0.06	-0.060
	(0.081)	(0.074)	(0.150)	(0.056)
Neither Owned nor Rented	0.219	-0.14	0.523*	-0.047
	(0.158)	(0.120)	(0.203)	(0.090)
Income below Poverty Line	-0.215*	0.047	0.045	-0.001
	(0.108)	(0.083)	(0.171)	(0.072)
Household Size	-0.062	0.02	0.054	-0.008
	(0.042)	(0.023)	(0.037)	(0.021)
Number of Children in Household	0.142**	-0.018	-0.007	-0.026
	(0.055)	(0.033)	(0.060)	(0.030)

Table 2.2 (Continued)

Prior Wave Characteristics				
Characteristics of Head of Household				
Sex (female=1)	-0.473**	0.031	-0.768**	0.474***
	(0.172)	(0.194)	(0.298)	(0.136)
Age	-0.008	0.001	0.027**	0.002
	(0.007)	(0.005)	(0.009)	(0.004)
Education (reference = High School Diploma)				
Less Than High School	0.022	0.275**	-0.018	-0.221**
	(0.114)	(0.096)	(0.183)	(0.075)
Some College	0.019	-0.123	-0.13	0.069
	(0.102)	(0.104)	(0.210)	(0.075)
Bachelors or More	-0.647**	-0.323*	-0.722	0.525***
	(0.215)	(0.151)	(0.387)	(0.131)
Employment (reference = Employed)				
Unemployed	0.027	-0.089	-0.131	0.048
	(0.122)	(0.094)	(0.171)	(0.077)
Retired/Disabled	0.308	0.290*	0.21	-0.336**
	(0.172)	(0.125)	(0.222)	(0.103)
Marital Status (reference = Married)				
Single	-0.153	0.838***	0.427	-0.990***
	(0.237)	(0.214)	(0.357)	(0.157)
Widowed, Divorced, Separated	0.788***	1.280***	1.223***	-1.707***
	(0.178)	(0.188)	(0.275)	(0.135)
Characteristics of Household				
Housing Tenure (reference = Owned)				
Rented	0.390***	0.292***	0.417**	-0.339***
	(0.079)	(0.070)	(0.137)	(0.052)
Neither Owned nor Rented	0.338*	0.536***	0.561*	-0.496***
	(0.170)	(0.112)	(0.235)	(0.098)
Income below Poverty Line	0.035	-0.029	0.024	0.057
	(0.098)	(0.072)	(0.156)	(0.060)
Household Size	-0.298***	0.713***	0.244***	-0.627***
	(0.080)	(0.036)	(0.035)	(0.034)
Number of Children in Household	0.203*	-0.715***	-0.335***	0.661***
	(0.084)	(0.040)	(0.072)	(0.037)
Age of Youngest Child in Household	-0.011	-0.01	-0.079***	0.032***
	(0.011)	(0.009)	(0.019)	(0.007)
Prior Wave Household Change Indicators				
Change in Parents	0.987***	0.075	0.722***	-0.833***
	(0.119)	(0.121)	(0.195)	(0.084)
Change in Other Household Members	-0.105	1.759***	0.733***	-1.443***
	(0.141)	(0.069)	(0.176)	(0.062)
Joint Change Parents and Other Household Members	-0.102	1.163***	1.810***	-1.203***
	(0.251)	(0.145)	(0.201)	(0.116)
Year	0.002	-0.005	0.013*	-0.047***
	(0.004)	(0.003)	(0.006)	(0.003)
Constant	-6.034	5.074	-28.817*	95.814***
	(6.962)	(6.315)	(11.934)	(5.680)
Observations	54,669	54,669	54,669	54,669

Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

Table 2.3 presents the results from the IPT-weighted logistic regressions. I present results

from a regression on the full sample and then show results from regressions that include an

interaction between household change and race (comparing white children and black children).

In the full sample, experiencing changes in household composition involving one's parents or

experiencing changes in household composition involving non-parent, non-sibling household

members significantly reduce the odds of graduating from high school. The coefficient for

experiencing changes in both parents and other household members is negative, suggesting

negative effects of this combination of changes on high school graduation, but it does not reach

statistical significance.[5]

---

[5] I tested whether the effect of change in parents plus change in other household members is significantly different from the effect of change in both parents and other household members. In the full sample I cannot reject the null that the sum of parents and others equals the change in both (p=0.0513). I can, however, reject the null that the sum of the first two coefficients equals the third coefficient in the subgroup analysis limited to white children. Among whites the sum of change in parents and change in others is significantly different from the coefficient for joint change (p<0.02).

Table 2.3. Household Composition Change and High School Graduation

	Coefficient	95% Confidence Interval
Full Sample		
Change in parents	-0.412*	[-0.784, -0.041]
Change in other household members	-0.401*	[-0.771, -0.031]
Change in both	-0.278	[-0.669, 0.118]
Observations	3,763	
Among White Children		
Change in parents	-0.466*	[-0.877, -0.055]
Change in other household members	-0.636**	[-1.063, -0.208]
Change in both	-0.267	[-0.755, 0.221]
Observations	1,999	
Among Black Children		
Change in parents	0.218	[-0.538, 0.974]
Change in other household members	0.278[a]	[-0.334, 0.891]
Change in both	-0.016	[-0.679, 0.648]
Observations	1,641	

** $p<0.01$, * $p<0.05$
[a] Significantly different than white children, $p<0.05$

Disaggregating the sample into the two main racial groups represented in the PSID

suggests that the effects of changes in household composition may be worse among white

children than among black children. Table 2.3 shows that among white children, changes

involving parents and changes involving other household members both significantly reduce the

likelihood of high school graduation. Again, experiencing changes involving parents and other

household members appears to be negatively associated with high school graduation, but the

effect is imprecisely estimated. Figure 2.1 plots the predicted probability of high school

graduation among white children in the four categories of household change.[6] White children

experiencing no change in parents or other non-sibling household members have a predicted

probability of high school graduation of 87 percent. The predicted probability drops to 81

---

[6] These predicted probabilities are calculated using Stata's margins command using estimates
from the stabilized IPT-weighted outcome model and interacting category of household change
with race (white versus black).

percent among white children experiencing changes involving parents only and a low of 78 percent among those experiencing changes involving only non-parent, non-sibling household members. White children experiencing these non-parent changes in household composition have a predicted probability of high school graduation fully nine percentage points lower than children experiencing no change in household composition. Among black children, however, the findings are different. Neither changes among parents nor changes among other household members significantly predict high school graduation and the coefficients, though imprecisely estimated, are positive. The significant and negative effect of changes involving other household members among white children is significantly different than the estimated positive effect among black children (p<0.05).
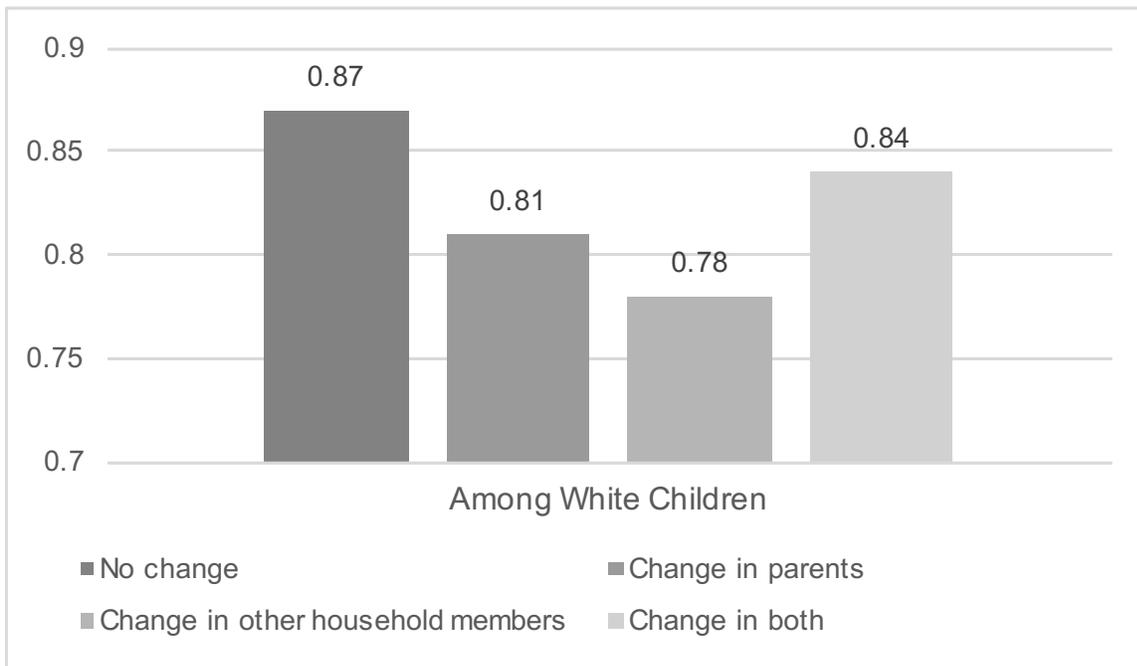
Figure 2.1. Predicted Probability of High School Graduation by Category of Household Change

Discussion

My findings show that changes in household composition involving parents and non-parent household members are consequential for children's educational attainment and, in turn, their wellbeing. I demonstrate the value of conceptualizing the changes in developmental environments to which children are exposed as a product of household complexity, rather than simply family instability. Informed by previous research on family instability and multigenerational households, this paper advances both literatures by accounting for household changes children experience beyond parents and their partners and by capturing the dynamic nature of extended family living arrangements. Further, I include in my measure of change household members not related to the child, acknowledging the contributions of non-relatives to household instability.

I use inverse probability of treatment weighting and marginal structural models in this analysis in order to reduce bias as a result of selection into household structure and changes. These models improve upon OLS models by addressing time-varying confounding variables, but still rely on assumptions in order to interpret the results as causal effects.[7] In particular, these models assume that all the characteristics that predict household change and are also associated with subsequent high school graduation are included as covariates in the prediction models that I use to estimate the weights. I include a number of characteristics of the individual child, head of household, and household in these models but there may indeed be other characteristics, such as characteristics of family members outside the household, that independently predict household change.

---

[7] Results from logit models not weighted with the inverse probability treatment weight are shown in Appendix D. Some coefficients in these models are significant at a higher level of confidence compared to the coefficients presented in Table 2.3, but the substantive conclusions do not differ.

I use a different specification in my outcome model than is common in recent research employing marginal structural models. These models are typically used to measure duration effects and the outcome models use a count of time spent in a certain condition, or an average measure of exposure, to predict the outcome of interest. For example, when using marginal structural models to estimate the effect of living in a disadvantaged neighborhood, Wodtke, Harding, and Elwert (2011) use an average level of exposure to neighborhood disadvantage across childhood to predict high school graduation. The equivalent specification in my case would be to sum all of changes in household composition children experience during their first 15 years and use those counts as predictors of high school graduation. Using this specification assumes that the number of changes has a linear relationship with probability of high school graduation, that the first change involving parents, for example, would have an equivalent effect as the second or third change involving parents, which is not necessarily predicted by prior research and theory. This alternative specification as a model with count variables instead of categorical variables returns negative coefficients for changes among parents, changes involving other household members, and joint changes.[8]

Another option addressing the linearity assumption would be to create a series of indicator variables that account for thresholds in the number of changes by type of change: an indicator for experiencing one change among parents and a separate indicator for two or more changes. The disadvantage of this approach is that the reference groups for sets of indicators become muddled. A child who experienced no changes at all is in the reference group for

---

[8] Results from models with counts as independent variables shown in Appendix E. All of the significant and negative coefficients in Table 2.3 are also negative in Table E.1, but not all reach conventional levels of significance.

changes among parents along with a child who experienced no changes among parents but a half dozen changes involving extended family members.

My categorization of exposure to household change is representative of the amount of volatility children experience in their households. In my sample, children who experience change only among parents are, on average, exposed to fewer changes over time than are children who experience change involving only other household members. Children who experience changes among both parents and other household members are exposed to the most amount of change in household composition over time. My three-variable specification is additionally parsimonious and easy to interpret.

Changes among household members do not appear to affect all children equally, as the effect of changes among parents and non-parents on high school graduation is significant and negative among white children but not significant among black children. Why might this be? As discussed earlier, family structures differ by race. A larger share of black children compared to white children live with single parents (Sarkisian and Gerstel 2004; Vespa, Lewis, and Kreider 2013) and children living with single mothers are more likely than children living with two parents to live in doubled-up and multigenerational households (Cohen and Casper 2002; Pilkauskas 2012).

In fact, there are substantial differences by race in the types of household change to which children in my sample are exposed. Overall, 47 percent of the sample experienced no change among parents or other non-sibling household members. Among whites, 54 percent experienced no change, but among blacks this statistic was only 18 percent. A smaller share of blacks was exposed to changes among parents only, 11 percent, compared to 16 percent of whites. And a larger share of blacks was exposed to changes among other household members

(31 percent compared to 13 percent) and joint changes among parents and other household

members (40 percent compared to 17 percent). Exposure to changes in household composition is

less common among whites than it is among blacks and could perhaps be a more disruptive

change in the lives of white children if they are less familiar with the experience and less

equipped to adjust to the change.

There are also other possible explanations for the differences in effects by race. The rate

of high school graduation differs by race, in my sample and in other national samples. In my

sample from the PSID, 85 percent of white children graduated from high school while only 74

percent of black children did so. It could be that among blacks, those children most susceptible to

disruption from household changes are already not graduating from high school for some other

reason. The disruption from household change may not move the needle.

I conceptualize changes in household composition as indicators or markers of volatility in

the lives of children. It could be that changes in household composition are a better indicator of

volatility among white children than among black children if these changes are more common

among blacks and potentially have less stigma attached to them.[9] There are likely other ways in

which the developmental contexts of white children and black children differ, on average, that

could explain why a change in household composition may be more disruptive to white children.

For example, black children are exposed to very different neighborhood environments than white

---

[9] In an attempt to test the stigma mechanism, I re-ran the models with an interaction term for
year of entry into the study, hypothesizing that the effect may be smaller in the later years if
there is less stigma attached to household changes in later years. The results support this
hypothesis for white children. The effects of all three types of household changes are negative
and significant for children entering the survey before 1982 (approximately half of the sample),
and significantly different from the non-significant effects among children entering the survey
later. A second specification comparing children entering the survey before 1989 (approximately
75 percent of the sample) versus those entering after returns the same result for white children.
Year of entry does not moderate the effects among black children: all coefficients remain
imprecisely estimated in both the 1982 and 1989 specifications.

children, living in more disadvantaged, impoverished, and violent contexts, on average (Perkins and Sampson 2015; Quillian 2003). Black children are also much more likely than white children to experience the incarceration of fathers and extended family members, which could prompt many different types of household composition change by removing parents from the household and pushing other relatives to join the household to provide resources and care. There is some evidence that black children are less negatively affected by family structure transitions because they have greater social protection, that is, support from other kin, and face greater socioeconomic stress (Fomby, Mollborn, and Sennott 2010). In sum, these differences suggest that exploring heterogeneous effects, by race and other characteristics, in future research would be worthwhile.

Conclusion

By showing that changes in non-parental household members are both common and consequential for children, this paper makes a needed contribution to the literatures on family instability and multigenerational households by broadening the conceptualization of family instability to incorporate changes among other members of children's households. That changes involving other household members have similar effects on high school graduation as do changes among parents suggests that prior research that did not account for other household members provides an incomplete understanding of how changes in children's families and developmental environments matter for their longer-term outcomes. Research focused narrowly on instability among parents and parents' romantic partners misses household changes among the 17 percent of children who experience a change among non-parent, non-sibling household members during childhood but not among parents. Prior research on family instability characterizes these children

70

as having stable households, which could understate the consequences of disruption since children with parental instability are being compared to a mixed group of those with and without other types of instability. Conversely, ignoring instability involving extended family members and non-relatives could overstate the consequences of parental instability if changes among parents tend to be correlated with changes among other household members and the effect of changes among others is attributed to changes among parents.

I also make a methodological contribution by using time-varying methods for causal inference to show that changes in non-parental figures matter for children's likelihood of graduating from high school. This overall finding masks heterogeneity by racial group, as the negative effect of changes in household composition is limited to white children. Among black children, the causal effects are not significant and are in the positive direction.

This topic is ripe for further research. It would be worthwhile to give more attention in future work to how different specifications of change affect outcomes differently. For example, future work should expand the categories of change modeled here to consider the number and type of changes, entry into versus exit from the household, and changes among adult household members versus the entry and exit of children, since the age of household members could have meaningful implications for resources available to children. A holistic approach to studying the effects of changes in household composition on children's outcomes is necessary as recent research introducing the concept of developmental ecologies suggests that repeated exposure among young children to changes in coresident maternal romantic partners and grandparents predict favorable outcomes in kindergarten depending on the socioeconomic resources available in and health risks posed by children's families, homes, and environments (Mollborn 2016). Future research should take a more holistic view of families and households to more accurately

represent change and volatility in children's lives and estimate how experiences in childhood

predict later life outcomes.

3.

Compounded Change: Residential Mobility and Changes in Household Composition

Scholars focused on children's wellbeing have long focused on isolating the effect of one characteristic of children's families or one dimension of disruption in children's lives while controlling for context and other characteristics. Residential mobility and changes in family structure are two commonly-researched disruptions in children's lives. Research on family instability generally considers the effect of divorce on children's school performance (Kim 2011) or the effect of grandparents joining a child's household on cognitive outcomes (Mollborn, Fomby, and Dennis 2012), for example, while controlling for other socioeconomic characteristics or treating them as mediators. Many studies of residential mobility examine the effect of moving on short-term outcomes like behavior and depression (Gilman et al. 2003; Ziol-Guest and McKenna 2014) or longer-term outcomes like delinquency and high school dropout (Haveman, Wolfe, and Spaulding 1991; Vogel, Porter, and McCuddy 2017), but rarely do these studies incorporate indicators of changes happening inside the household that could be prompting or prompted by a move.

I argue in this chapter that a single-minded focus on one type of change in children's lives fails to capture children's lived experiences and provides an incomplete understanding of how instability and disruption matter for children's long-term outcomes. I use data from the Panel Study of Income Dynamics to track residential mobility and changes in children's households from the time of their birth until age 15 and use the changes they experience to

predict their likelihood of high school graduation, an important marker in their transition to adulthood.

Descriptively, I show that nearly 80 percent of children move at least once before the age of 15 and that nearly 40 percent of children experience a change in household composition involving their parents or non-parent, non-sibling household members at the same time that they move. I also show that the children who experience the most changes in household composition during childhood have the highest rates of residential mobility. I advance two hypotheses about the relationship between residential mobility and changes in household composition. The first is that residential mobility mediates the effects of household composition change on high school graduation; controlling for moves, changes in household composition do not significantly predict high school graduation. The second hypothesis is that residential mobility moderates the effects of changes in household composition on high school graduation; changes in household composition are only negative for children when they occur in combination with a move.

I move beyond research that controls for residential mobility when estimating the effects of divorce, or accounts for mothers' partnership changes when estimating the effects of moving, with a much broader definition of household change that captures changes among other relatives and non-relatives in addition to parents and their romantic partners. I find that residential mobility and changes in household composition independently and jointly reduce the likelihood of high school graduation. I conclude by arguing that future research on the effects of disruption in children's lives should consider the compounded change represented by residential mobility and changes in household composition since these changes so often occur simultaneously in children's lives.

Background and Motivation

The goal of this chapter is to determine how two types of changes in children's developmental environments – residential mobility and changes in household composition – affect their educational attainment, separately and in combination. In this section I consider prior research on how these two types of changes matter for a range of children's short- and long-term outcomes. Most of this research considers either residential mobility or changes in household composition; rarely are the two types of changes considered in tandem or modeled as a compounded change, despite the fact that changes in household composition often occur alongside moves (Desmond and Perkins 2016). Further, the same underlying characteristics predict residential mobility and household change, as lower-income individuals and those living in renter-occupied units are more likely both to move and experience a change in household composition (Geist 2008; Schacter 2004; South and Crowder 1997). It seems reasonable, therefore, to consider these types of changes together when examining the effects of disruption in children's lives on longer-term outcomes.

Prior research shows that changes in family structure among parents and other household members matter for children's outcomes. Much of this research has focused on changes in parental relationships, modeling the effects of divorce, dissolution, and re-partnering on children's outcomes. In general, elementary school-aged children whose parents divorce have worse school performance outcomes, worse social skills, and demonstrate more problem behaviors as a result than children whose parents remain married (Kim 2011). Detrimental effects of divorce have been identified among older children as well (Cherlin, Kiernan, and Chase-Lansdale 1995) and there is evidence that divorce in one generation has downstream effects on educational attainment and marital discord for both the second and third generations

(Amato and Cheadle 2005). Children are often exposed to more than one change in family structure during childhood and the focus of research on family instability has shifted to acknowledge that a more accurate representation of children's experiences would account for the many changes happening among parents and their romantic partners (Beck et al. 2010). A large literature documents the deleterious effects of exposure to multiple changes in family structure, including lower school engagement, externalizing behavior, negative relationships with teachers and peers (Cavanagh and Huston 2006; Fomby and Cherlin 2007; Fomby and Osborne 2010; Lee and McLanahan 2015; McLanahan 2011) and lower educational attainment, early home-leaving, non-marital childbearing, depression, delinquency, and drug use (Aquilino 1996; Brown 2006; Cavanagh 2008; Wu 1996).

Parental relationship changes are not the only consequential household changes to which children are exposed. Other research has considered the effect of grandparents joining or leaving children's households for children's short-term cognitive outcomes, with mixed results. Infants and toddlers living with single mothers had a higher rate of cognitive growth when a grandparent joined their household compared to children living in stable family structures (Sun and Li 2014). Other research, however, finds that among white and African American children, household changes involving grandparents are negatively associated with short-term cognitive outcomes (Mollborn, Fomby, and Dennis 2012). These studies that incorporate grandparents while also accounting for maternal background information and changes in maternal relationship status take a step forward from the studies that modeled only parental divorce and repartnering; they demonstrate that conceptualizing children's exposure to household change as a product of changes among parents, their partners, and other household members is important when estimating children's outcomes.

Prior research on residential mobility also suggests that moving can be disruptive to children and is associated with negative short- and long-term outcomes across many domains. Moving, especially repeated residential mobility during childhood, is associated with increased emotional and behavior problems, depression, and increased use of professional psychological help (Gilman et al. 2003; Jelleyman and Spencer 2008; Simpson and Fowler 1994). Also in the psychological realm, residential mobility is associated with elevated stress (Raviv et al. 1990) and increased likelihood of attempted suicide among girls (Haynie, South, and Bose 2006). Prior research also finds a connection between residential mobility and risky behaviors among adolescents, including early onset of sexual activity (South, Haynie, and Bose 2005) and delinquency (Vogel, Porter, and McCuddy 2017). School performance and educational attainment have long been outcomes that researchers connect to residential mobility, finding that moving during early childhood (ages 4-7) or adolescence (ages 12-15) is associated with high school dropout (Haveman, Wolfe, and Spaulding 1991) and that attending school with a greater share of classmates who have recently moved themselves increases the odds that any one mobile student will drop out (South, Haynie, and Bose 2007). Considering a range of outcomes, prior research has conceptualized residential mobility as an independent disruptive event in children's lives and finds negative associations between moving and short- and long-term wellbeing and attainment.

One goal of this chapter is to determine the coincidence of residential mobility and household change among children. Research on the effects of changes in household composition and the effects of residential mobility occasionally controls for one type of change when estimating the effect of the other. Studies focused on the effects of family structure on school performance find that controlling for residential mobility explains between 10 and 20 percent of

the variation in performance between children in single-parent families and children in two-parent families and between 30 and 40 percent of the variation between children living with step-parents and children living with two biological parents (Astone and McLanahan 1994; McLanahan and Sandefur 1994). Residential mobility significantly affects children's cognitive outcomes when children move within six months of experiencing a change in family structure, but moving alone is not significantly associated with cognitive or behavioral outcomes (Verropoulou, Joshi, and Wiggins 2002). Children who consistently live with two biological parents are buffered from the negative effects of residential mobility while children living in any other family structure have worse school outcomes after just one move (Tucker, Marx, and Long 1998). Two recent studies estimate the effects of residential mobility on children's behavior problems controlling for changes in the mothers and fathers' relationships, finding that higher levels of housing mobility leads to higher levels of behavior problems (Fowler et al. 2014) and more attention problems and externalizing behavior (Ziol-Guest and McKenna 2014).

By controlling for residential mobility when estimating the effects of family structure, or, conversely, by controlling for changes in family structure when estimating the effects of residential mobility, these studies hold constant one form of instability when estimating the effects of another. Rarely, however, has previous research conceptualized instability in children's lives as a combination of changes in coresident household members and changes in residence, often with a change in one domain prompting a change in the other. Further, these studies nearly always limit the type of household change they measure to changes in parents and their romantic partners. As I have shown in Chapter 1 and Chapter 2, children are exposed to many changes in household members beyond their mothers and fathers, and as I will demonstrate in this chapter, children who experience changes among other household members have higher rates of

residential mobility, on average, than do children who experience no changes in household composition or changes among parents alone. Thus, research that does not account for both residential mobility and changes in household composition, as I do here, is potentially missing a meaningful dimension of instability in children's developmental environments that has consequences for longer-term outcomes.

Household Disruption and Education

Graduating from high school has been and remains an important marker in the transition to adulthood and an indicator of young adult attainment. High school graduation predicts labor market success (Rumberger 1987), and educational attainment in general is associated with income and wealth (Oreopoulous 2007; Rumberger 1987). Educational attainment is also positively associated with marriage and negatively associated with marital dissolution (Copen et al. 2012; Goldstein and Kenny 2001; Martin 2006). Individuals with higher educational attainment also tend to be healthier and to have lower rates of non-marital childbearing (Freudenberg and Ruglis 2007; Upchurch, Lillard, and Panis 2002). Thus, high school graduation is itself meaningful but it also predicts outcomes in many other dimensions of wellbeing.

Previous research provides many reasons to hypothesize that residential mobility and changes in children's household composition are both related to high school graduation. Changes in household composition may affect the resources available to children, as the addition of income-earning household members could ease housing cost burdens, freeing up more money for essential items like food and clothing and other expenses related to education like school supplies and extracurricular activities. Conversely, if household composition changes result in less per capita income, because an income earner leaves, or a dependent individual joins, this

could strain the household budget. Household crowding, a possible result of changes in household composition, is negatively associated with short-term behavior and health outcomes among children (Solari and Mare 2012). If adults leave the household or are occupied caring for new household members, children may have fewer people supervising their schoolwork and extracurricular activities, leaving room for delinquent behavior. Moving is expected to affect educational attainment by reducing social capital (Coleman 1988) and through its intermediate effects on stress (Raviv et al. 1990), behavior (Jelleyman and Spencer 2008), and delinquency (Vogel, Porter, and McCuddy 2017). Residential mobility and changes in household composition are disruptive and potentially stressful experiences for children.

Informed by the literatures on family instability, extended family households, and residential mobility, this chapter explores the relationship between children's exposure to residential mobility and changes in household composition. I test two main hypotheses. The first is that residential mobility mediates the effect of household composition change on high school graduation. In other words, changes in household composition that reduce the likelihood of high school graduation are no longer significant once I account for residential mobility. The second hypothesis is that residential mobility moderates the effects of changes in household composition on high school graduation. Changes among household members may be more or less damaging to the children's educational attainment depending on whether they occur alongside a residential move.

Data

I use data from the 1968 through the 2013 waves of the Panel Study of Income Dynamics (PSID) to estimate the effects of residential mobility and changes in household composition on

80

the educational attainment of children. Data collection for the PSID began in 1968 with a panel of approximately 4,800 nationally representative families. These 4,800 families contained over 18,000 individuals in 1968 and the survey has followed these individuals and their descendants for over 45 years. The PSID interviewed families annually from 1968 until 1997 and biennially from 1997 until 2013. I use the PSID to follow children from the time of their birth and entry into the study until they are teenagers, tracking the changes in household composition they experience and the number of times they moved homes. I construct household rosters and track residential mobility for the 5,024 children who are continuously present in a responding PSID household from age 1 to 15 years. My outcome models are limited to the 3,765 individuals for whom I have complete household roster and residential mobility data until age 15 and who are present in or reported by a PSID household at age 20. All descriptive statistics and multivariate analyses are weighted to account for sample selection and attrition.

To determine the types of changes in household composition children experienced, I construct household rosters at each wave of the survey and track which members of children's households entered or left across waves. I use a combination of the parent pointer variables and the relationship to head variable to identify how each member of a household is related to the focal child. The relationship to head variable is more detailed beginning in the 1983 wave and my assignment process accounts for the additional complexity introduced in 1983. My method for identifying and assigning relationships is detailed in Chapter 2. After assigning specific relationships between children and other household members I create four general relationship categories: parents, siblings, other relatives, and non-relatives.

I estimate whether the effects of changes in household composition differ when a child experiences a move along with the entry or exit of a household member or members. How does

the disruption differ when these two types of changes coincide compared to when they are experienced separately? In addition to tracking changes in household composition, I use the longitudinal data in the PSID to determine when children in the survey moved homes. The survey permits two methods of identifying residential mobility and I use both of them to create an indicator of residential mobility for each child.

The first method uses a survey question asked of the head of household in the main study. In each wave of the survey the interviewer asks the head of household whether he or she has moved any time since the month and year of the last interview. This question captures moves of any distance – from next door to across the country – and is a valid indicator of whether children in the household moved so long as the head of household lived with the children in the prior wave. My analysis of changes in household composition, however, makes clear that there are many occasions when heads of household enter children's households between waves; their report on their own residential mobility since the prior wave does not necessarily represent the experience of coresident children who are in my sample. Therefore, I use this variable to indicate residential mobility among children in the sample only when the head of household answering the question in the current wave lived with the focal child in the prior wave as well. The head of household in the current wave need not have been the head of household in the prior wave since it is relatively common for individuals to become heads of household from within the household (when the prior head of household left and no new head entered). If the current wave head of household lived with the child in the prior wave I use her report of residential mobility to determine whether the focal child moved. If she did not live with the child in the prior wave, I leave the child's move status as missing.

The second method of determining residential mobility is to compare each child's census tract of residence in the current wave to the prior wave. Fine-grained geographic identifiers are not available in the public use PSID data, but with access to the restricted use data I can link census tracts to each child's family in each wave of data collection. The advantage of the census tract data is that these tract assignments are potentially more objective than the head's response to a survey question because they are determined using the PSID's address of record for the household. One disadvantage of comparing tract identifiers wave over wave to determine moves is that short-distance moves (i.e., within-tract) will not be captured. A second disadvantage of the tract data is that the geocoding of addresses to census tracts varies in precision and this variability may lead analysts to assume that the family moved when in fact it did not move. In very few cases, respondent addresses were not able to be geocoded so their tract identifiers are missing. For approximately 20 percent of my child-wave observations, addresses were geocoded at a ZIP code or higher level of geography instead of the more precise address and street level. In these cases, there may appear to be a move when actually there is not. For example, an address geocoded at the address and street level should be assigned to its true census tract. The same address geocoded at the ZIP code level may be assigned to a different census tract because the ZIP code contains more than one census tract. In the cases where the precision of geocoding varies wave by wave, comparing census tracts from prior to current wave may indicate a move occurred when one did not.

Therefore, I create a composite move variable for each wave the child appears in the survey drawing on both the survey response adjusted for household head presence and census tract variables described above. In the first year a child appears in the survey as an infant her move variable is set to 0. In all subsequent waves, I set her move variable to 0 if both the

adjusted survey response and the census tract comparison agree that no move occurred.

Conversely, I set her move variable to 1 if both methods agree that she moved. If the two

indicators of residential mobility are not equal, I privilege the adjusted survey response because

the survey response will presumably capture short-distance moves and is not affected by the

precision of geocoding. If the adjusted survey response variable is missing (because the head of

household in the current wave did not live with the child in the prior wave), I compare prior

wave to current wave census tracts to determine whether a child moved and I account for the

precision of geocoding in identifying when moves occurred (my step-by-step residential mobility

assignment process is detailed in Appendix F). At the conclusion of this process, my composite

move variable is missing for 0.27 percent of child-year observations.

My models predicting high school graduation include a number of covariates

representing characteristics of the child, head of household, and the household in addition to the

household change and residential mobility variables described above. These characteristics are

related to both children's likelihood of graduating from high school and the likelihood of

residential mobility and experiencing changes in household composition across time. All

covariates included are measured the first year that I observe the child in the survey, typically

close to the child's birth, which in my sample ranges from 1968 to 1997. I include the child's sex

(female = 1), whether the child lived with married parents the first year I observe them in the

study, and their year of entry into the study. I also account for the head of household's race or

ethnicity (indicators for black, Hispanic, and other race with white as the reference category),

educational attainment (indicators for less than high school, some college, bachelor's degree or

more, with high school diploma as the reference category), employment status (indicators for

unemployed and retired or disabled, with employed as reference), and marital status (single,

84

widowed/divorced/separated, married as reference).[10] My set of baseline covariates also contains whether the housing unit is owned, rented, or neither, an indicator for household income below the poverty line, and continuous variables measuring household size and number of children in the household.

Methods

I begin with a descriptive account of how residential mobility is associated with changes in household composition among children. To do this I collapse household change into four mutually exclusive categories based on the type of change children experienced during childhood up to age 15. The first category includes children who experience changes only among parents and step-parents; this category aligns with previous research on family instability focused on parents and their partners. The second category includes children who experience changes only among non-parent, non-sibling household members, namely extended family members and non-family members, but experienced no exits or entries among parents before age 15. The third category contains children who experience changes among both parental and other household members; I also refer to these as joint changes because the child's household could be losing a parental figure and gaining a non-parent at the same time. The fourth category is the remainder of children who experienced no changes among parents or non-parent, non-sibling household members. This is the stable household composition category.

---

[10] For most individuals in my sample the head of household's marital status at baseline is indicated by whether the child lived with married parents at baseline since his or her parent is the head of household. But a substantial proportion of children in my sample live in a household where their parent is not the head of household (rather their grandparent or another relative or non-relative heads the household) so the inclusion of the head's marital status captures an independent dimension of the household's socioeconomic status.

After showing that children commonly move homes at or close to the same time they experience changes in household composition, I use logit models to predict high school graduation with two primary specifications of household composition changes and residential mobility. Chapter 2 shows that different types of household change have a significant effect on high school graduation. But given how often household composition changes co-occur with residential mobility, is it really the household composition changes that matter? Or is it the disruption from the move? The first set of models I present here in Chapter 3 is designed to assess the hypothesis that residential mobility mediates the effect of household composition changes on high school graduation. Once I control for residential mobility, do household composition changes still significantly affect high school graduation? Are the significant effects of household composition changes simply masking effects of moving? I run a logit model represented by Equation 3.1, below, predicting high school graduation with indicators for three categories of household composition change (with no change as the reference category) and controls for baseline characteristics. In this equation, pc represents change among parental figures only, oc change among non-parent, non-sibling household members only, and jc changes among both parental and other household members. The baseline variables are represented by x_0.

Eq. 3.1: $logit\big(\mathrm{P}(Y_i = 1)\big) = \boldsymbol{\alpha} + \gamma_1 \mathrm{pc} + \gamma_2 \mathrm{oc} + \gamma_3 \mathrm{jc} + x_0 \boldsymbol{\beta}$

Then, I run a second logit model in which I add variables representing the child's residential mobility up to age 15 (Equation 3.2, below). I specify residential mobility as a continuous variable (move). For residential mobility to mediate the effects of changes in household composition on high school graduation, the coefficients for the household change

86

variables in this second model, represented by the lower-case gammas, would need to be reduced

in magnitude and significance compared to the results from the model without residential

mobility (shown in Equation 3.1).

Eq. 3.2: $logit(P(Y_i = 1)) = \pmb{\alpha} + \gamma_1 pc + \gamma_2 oc + \gamma_3 jc + \delta_1 move + x_0 \pmb{\beta}$

I also hypothesize that residential mobility could moderate the effects of household

composition change on high school graduation. In this scenario, controlling for residential

mobility does not reduce the significance of changes in household composition. Household

composition could affect all children who experience it, but household change may have

different effects on children who experience it in combination with residential mobility. To test

this hypothesis, I run a logit model predicting high school graduation with a set of seven

indicators representing interactions between household change and residential mobility,

controlling for baseline covariates (x_0). The reference category contains the children whose

environments are the most stable over time, those who experience no moves and no changes

among parents or non-parent, non-sibling household members by age 15. The first three

indicators represent children who did not move at all, but who experienced household

composition changes among, respectively, parents (pco), other household members (oco), or

both parents and other household members (jco). Their exposure to changes in developmental

environments is characterized by changes in household composition but stability in residential

location. The estimated effects of household changes in the absence of residential mobility are

represented by the lambda coefficients in the equation below.

Eq. 3.3: $logit\big(P(Y_i = 1)\big) = \alpha + \lambda_1 pco + \lambda_2 oco + \lambda_3 jco + \omega_1 pcm + \omega_2 ocm + \omega_3 jcm + \pi_1 move + x_0 \boldsymbol{\beta}$

The next three indicators represent children who experienced household changes – among parents (pcm), other household members (ocm), or both parents and other household members (jcm) – and residential mobility at the same time. I code these variables as combination move and household change if the child's composite move variable indicates a move in the same wave as the household change occurred or in the wave prior to or following the household change. Since these changes are often linked, with moves prompted by changes in household composition, or household composition changes occurring as a result of moves, this lagged indicator of combined change allows for simultaneous changes and those where it takes a few months for the subsequent change to occur. The omega coefficients show the estimated effects of three types of household change when they occur in combination with a residential move. The model contains a final indicator for children who moved but did not experience a co-occurring change in household composition (move). This captures the balance of children not represented by the six variables that serve to interact household composition change with residential mobility and distinguishes children who move from the reference group of children who neither move nor experience changes in household composition.

All of the descriptive statistics and multivariate results I report are weighted with the longitudinal weights provided by the PSID to account for study design and sample attrition. Interpreting the coefficients from these models as causal effects requires strong assumptions, primarily that there are no uncontrolled confounders. It is impossible to know how much these results are biased by omitted variables, but I control for a large set of baseline characteristics of

the child, head of household, and household to reduce selection bias in the estimates. With a larger sample it would be useful to estimate inverse probability of treatment weights (IPTW) and marginal structural models to facilitate causal estimates of the six primary treatment conditions in Equation 3.3. My sample lacks the power to estimate these models, yet I have confidence that the results from these logit models are comparable to results I would get from IPTW and marginal structural models. In Chapter 2, I employ IPTW and marginal structural models to estimate the effects of household composition change on high school graduation and my weighted results do not lead to substantively different conclusions than do the unweighted results that do not account for dynamic selection.

Results

      Table 3.1 presents weighted baseline descriptive statistics for the sample of individuals eligible for inclusion in the final models, those for whom I observe the outcome of high school graduation, pooled across all waves of the PSID. Approximately half of the children in the sample are female, 80 percent of them lived with married parents at baseline, and 82 percent of them graduated from high school. At baseline, approximately 80 percent of children lived with white heads of household, and 17 percent with black. The modal educational attainment of heads of household was high school graduate (39 percent), with 26 percent having less than a high school education and 15 percent with at least a bachelor's degree. Nearly all of the children lived with employed heads of household, yet 13 percent lived in a household with income below the poverty line. On average, these children's households contained just over four people and two children.

For the purposes of this chapter, the most interesting characteristics presented in Table 3.1 are the variables showing exposure to household change and residential mobility. Table 3.1 shows eight mutually exclusive indicators of household composition change and residential mobility, four variables representing children who did not move before age 15 followed by four variables representing children who did move at least once before age 15. The majority of children in the sample moved at least once during childhood, therefore the four categories of children who experienced household change in the absence of residential mobility are fairly small: two percent of the sample experienced a change only among parents, four percent a change only among other household members, and two percent a joint change among parents and other household members. Fourteen percent of the sample neither moved before the age of 15 nor experienced change in household composition among parents or non-parent, non-sibling household members.

Table 3.1. Descriptive Statistics: Household Change and Residential Mobility

	Mean	SD
Child Sex (female=1)	0.51	
Household Change Category (no move)		
Change in Parents	0.02	
Change in Other Household Members	0.04	
Joint Change Parents and Other Household Members	0.02	
No Change	0.14	
Household Change Category (with move)		
Change in Parents and Move	0.09	
Change in Other Household Members and Move	0.13	
Joint Change and Move	0.15	
Move Alone	0.42	
Outcome: Child Graduated from High School	0.82	
Baseline Characteristics		
Child Lives with Married Parents	0.80	
Characteristics of Head of Household		
Sex (female=1)	0.15	
Age	30.71	8.75
Race/Ethnicity		
White	0.78	
Black	0.17	
Hispanic	0.04	
Other	0.01	
Education		
Less Than High School	0.26	
High School Diploma	0.39	
Some College	0.19	
Bachelors or More	0.15	
Employment		
Employed	0.93	
Unemployed	0.04	
Retired/Disabled	0.03	
Marital Status		
Married	0.84	
Single	0.08	
Widowed, Divorced, Separated	0.08	
Characteristics of Household		
Housing Tenure		
Owned	0.53	
Rented	0.41	
Neither Owned nor Rented	0.06	
Income below Poverty Line	0.13	
Household Size	4.36	1.73
Number of Children in Household	2.22	1.39
First Year Child Observed in PSID	1980	
Observations	3,838	

Weighted to account for sample selection and attrition

These descriptive statistics show just how common residential mobility is among children under the age of 15, as nearly 80 percent of the sample moved at least once during childhood. Just under 10 percent of the sample moved at the same time they experienced a change among parents, 13 percent moved and experienced a change among other household members, and 15 percent moved and experienced a change among both parents and other household members. The balance, or 42 percent of the sample, moved at least once, but not at the same time they experienced a change in household composition.

Exposure to residential mobility and changes in household composition are significantly associated ($p<0.000$). Table 3.2 shows the average number of moves made before age 15 by children in each mutually exclusive category of household change. Children who have the most stability among parental figures and other household members also make the fewest moves, an average of less than two before age 15. Children who experience changes among parents or among other household members move an average of three times before age 15. It is precisely the children who experience the most changes in household composition that also make the most moves, over four on average. Many children experiencing instability in one dimension of their developmental environment are experience disruption in another dimension as well.

Table 3.2. Number of Moves per Category of Household Change

	Mean	95% Confidence Interval
No changes among parents or non-parent, non-siblings	1.70	[1.61, 80]
Changes among parents only	2.90	[2.70, 3.10]
Changes among non-parent, non-siblings only	2.90	[2.73, 3.08]
Changes among parents and others	4.25	[4.06, 4.43]

Table 3.3 looks at the association between these types of changes in a slightly different way. In this table I show average number of changes experienced by children in each of the

mutually exclusive categories of household change employed as indicators in the equations above. On average, children are exposed to more changes among other household members than changes in parents. Among children who moved during childhood and children who did not, those who experienced changes among non-parent, non-sibling household members experienced more changes in household composition and more residential mobility than children who experienced changes among parents alone.

Table 3.3. Number of Changes in Each Category

	Mean	SD	Min	Max
Household Change Category (no move)				
Change in Parents	1.31	0.47	1	2
Change in Other Household Members	2.45	1.18	1	7
Joint Change Parents and Other Household Members	0.89	0.85	0	4
Household Change Category (with move)				
Change in Parents and Move				
Change in Parents	1.88	0.96	1	6
Move	3.74	2.13	1	11
Change in Other Household Members and Move				
Change in Other Household Members	3.06	1.88	1	14
Move	4.02	2.37	1	13
Joint Change and Move				
Joint Change in Parents and Others	0.90	0.92	0	6
Change in Parents	1.16	1.10	0	9
Change in Other Household Members	2.18	1.77	0	13
Move	5.11	2.68	1	14

Residential Mobility as Mediator

Coefficients from multivariate models are presented in Tables 3.4 and 3.5. The models in Table 3.4 test the hypothesis that residential mobility mediates the effect of changes in household composition on probability of high school graduation, controlling for baseline covariates. Model 1 contains indicators for three mutually exclusive types of household change: change among parents, change among non-parent, non-sibling household members, and change among both parents and other household members, with children who experience none of these changes as

the reference group. The coefficients for these three indicators show that exposure to any of these changes reduces the probability of high school graduation compared to children who experience no changes, holding constant characteristics of the child, head of household, and household. In addition to household change, being female is associated with a higher likelihood of high school graduation and having a household head with less than a high school education, living in a rented dwelling, and an income below the poverty line is associated with a lower likelihood of high school graduation.

Model 2 in Table 3.4 adds a continuous variable for the number of residential moves a child made before age 15. Controlling for the same three categories of household change and baseline covariates, each move a child makes reduces the odds of high school graduation by seven percent ($e^{-0.070} = 0.93$). With the inclusion of the residential mobility variable the significance of the household change variables is reduced, but the magnitude of the coefficients is not dramatically different from Model 1. For residential mobility to fully mediate the effects of household change on high school graduation, the coefficients on the three household change variables would need to be substantially reduced and rendered insignificant with the addition of the residential mobility variables. While the point estimates of the parent change, other household member change, and joint change coefficients are closer to zero in Model 2 compared to Model 1, they are not substantially different, and two of the three are still at least marginally significant. The same covariates – sex, head of household's education, housing tenure, and poverty – remain significantly associated with high school graduation even after controlling for household change and residential mobility.

In sum, Table 3.4 provides rather weak evidence for the hypothesis that residential mobility mediates the effect of household change on high school graduation. A test of joint

significance of the three household change coefficients in Model 1 shows that exposure to household change predicts high school graduation (p=0.0075); the same test of these coefficients in Model 2 is weaker, and only marginally significant (p=0.06). But, the individual coefficients are not different enough to support a definitive finding that household change does not affect high school graduation in the presence of residential mobility.[11]

Table 3.4. Mediating Models: Logit Model Coefficients Predicting High School Graduation

	Model 1	Model 2
Household Change Indicators		
Change in Parents	-0.371*	-0.306+
	(0.178)	(0.180)
Change in Other Household Members	-0.532**	-0.441*
	(0.167)	(0.171)
Joint Change Parents and Other Household Members	-0.425*	-0.283
	(0.169)	(0.176)
Move (continuous variable)		-0.070**
		(0.024)
Child Sex (female=1)	0.305**	0.322**
	(0.113)	(0.113)
Baseline Characteristics		
Child Lives with Married Parents	-0.052	-0.019
	(0.290)	(0.289)
Characteristics of Head of Household		
Sex (female=1)	-0.449	-0.461
	(0.449)	(0.452)
Age	-0.011	-0.014
	(0.009)	(0.009)
Race/Ethnicity (reference = White)		
Black	0.090	0.071
	(0.163)	(0.164)
Hispanic	-0.345	-0.328
	(0.283)	(0.277)
Other	1.305+	1.270+
	(0.67)	(0.67)

[11] In Appendix G I include a table showing the results of supplemental analysis specifying the residential mobility variable as a three-category variable instead of a continuous variable. The model included an indicator for whether the child moved one or two times (38 percent of sample) or three or more times (41 percent of sample), with no moves as the reference category (21 percent of sample). In this model, the household change coefficients were all at least marginally significant and the tests of joint significance of the household change variables (p=0.048) and the residential mobility variables (p=0.048) were also significantly different from zero.

Table 3.4 (Continued)

Education (reference = High School Diploma)		
Less Than High School	-0.644***	-0.624***
	(0.144)	(0.145)
Some College	0.089	0.077
	(0.172)	(0.172)
Bachelors or More	0.255	0.253
	(0.199)	(0.200)
Employment (reference = Employed)		
Unemployed	0.408	0.422
	(0.269)	(0.268)
Retired/Disabled	0.269	0.24
	(0.391)	(0.388)
Marital Status (reference = Married)		
Single	0.249	0.201
	(0.503)	(0.507)
Widowed, Divorced, Separated	0.196	0.193
	(0.477)	(0.480)
Characteristics of Household		
Housing Tenure (reference = Owned)		
Rented	-0.326*	-0.232+
	(0.132)	(0.136)
Neither Owned nor Rented	-0.804***	-0.761**
	(0.219)	(0.221)
Income below Poverty Line	-0.405*	-0.387*
	(0.179)	(0.181)
Household Size	-0.032	-0.035
	(0.055)	(0.055)
Number of Children in Household	-0.002	-0.009
	(0.068)	(0.068)
Year	-0.003	-0.004
	(0.008)	(0.008)
Constant	8.614	11.15
	(15.35)	(15.41)
Observations	3765	3765

Robust standard errors in parentheses, *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

Residential Mobility as Moderator

My second hypothesis about the relationship between residential mobility and household change as it affects children's educational attainment is that residential mobility moderates the effect of household change on probability of high school graduation. In other words, the effect of household change on high school graduation will be different for children who also experience

the disruption of moving homes. Results from a model testing this hypothesis are shown in Table

3.5. To test whether residential mobility moderates the effect of household change I include in

Model 3 seven indicators representing household change without residential mobility (three

indicators), household change with residential mobility (three indicators), and moving without

household change (one indicator). The reference category is children who neither move nor

experience changes among their parents or other household members before age 15.

Table 3.5. Moderating Models: Logit Model Coefficients Predicting High School Graduation

	Model 3
Household Change Indicators	
Change in Parents	0.104
	(0.510)
Change in Other Household Members	-0.308
	(0.385)
Joint Change Parents and Other Household Members	-0.625
	(0.447)
Change in Parents and Move	-0.665*
	(0.275)
Change in Other Household Members and Move	-0.640*
	(0.259)
Joint Change and Move	-0.537*
	(0.259)
Move Alone	-0.393+
	(0.225)
Child Sex (female=1)	0.308**
	(0.113)
Baseline Characteristics	
Child Lives with Married Parents	0.012
	(0.292)
Characteristics of Head of Household	
Sex (female=1)	-0.479
	(0.445)
Age	-0.014
	(0.009)

Table 3.5 (Continued)

Race/Ethnicity (reference = White)	
Black	0.081
	(0.165)
Hispanic	-0.349
	(0.282)
Other	1.326+
	-0.660
Education (reference = High School Diploma)	
Less Than High School	-0.659***
	(0.143)
Some College	0.112
	(0.173)
Bachelors or More	0.309
	(0.199)
Employment (reference = Employed)	
Unemployed	0.383
	(0.269)
Retired/Disabled	0.239
	(0.392)
Marital Status (reference = Married)	
Single	0.182
	(0.499)
Widowed, Divorced, Separated	0.138
	(0.475)
Characteristics of Household	
Housing Tenure (reference = Owned)	
Rented	-0.269*
	(0.134)
Neither Owned nor Rented	-0.771***
	(0.219)
Income below Poverty Line	-0.392*
	(0.181)
Household Size	-0.041
	(0.055)
Number of Children in Household	-0.012
	(0.068)
Year	-0.004
	(0.008)
Constant	10.60
	(15.49)
Observations	3765

Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

None of the coefficients for household change without moving show significant

differences in the probability of high school graduation between children who experience

household change without moving and children in the reference group. By contrast, children who move and experience a change among parents, those who move and experience a change among other household members, and those who move and experience a change in both parents and others are all significantly less likely to graduate from high school than are children who experience no moves and no changes in household composition. In addition, the coefficient for children who move but not at the same time as their household composition changes is negative and marginally significant. These results appear to support the hypothesis: changes in household composition only disadvantage children when they occur in combination with residential mobility.

In interpreting the coefficients in Model 3, however, it is important to keep in mind just how small some of these groups of children are. Referring back to Table 3.1 shows that the three groups of children in the household change without move categories together make up only eight percent of the sample. Thus, the failure of these coefficients to reach significance may be a consequence of low power, not moderation. In fact, none of the three tests comparing the three coefficients representing household change with residential mobility to the corresponding coefficients representing household change without residential mobility are significant.[12] Because there is not enough evidence to definitively say these coefficients differ from each other (the point estimates for two of the three types of changes are actually not that different), I cannot confidently assert that residential mobility moderates the effect of household change on high

---

[12] Appendix H presents results from an alternative specification of Model 3. In the alternative, I try to address the power issue by combining the parent change, other change, and joint change without moving indicators into one indicator of household change without moving. This increases the group size to close to eight percent of the sample, on par with the other categories. In this model, the coefficient for the household change without move indicator is negative, but not significant. The three indicators for household change with moving are all negative, significant, and not perceptibly different in magnitude from the results reported in Table 3.5.

school graduation. These results do, however, suggest that these two types of household disruptions are independently and jointly consequential for children's longer-term outcomes.

Discussion and Conclusion

In this chapter I consider the effects of two major disruptions in children's lives on a consequential long-term outcome: the probability of high school graduation. Previous research provides ample evidence to suggest that both residential mobility and changes in children's household composition involving parents, other relatives, and non-relatives matter for children's short- and long-term wellbeing. In addition to considering these changes independently, there is reason to believe that their coincidence and interaction could be meaningful. My descriptive findings show that the vast majority (78 percent) of the children in my nationally-representative sample moved at least once before the age of 15. Nearly 40 percent of the sample experienced some change in household composition at the same time or within a year or two of moving. These two types of changes in developmental environment are significantly associated with each other; Tables 3.2 and 3.3 show that children who have the most unstable households in terms of the number of times they experience parents and other household members entering and leaving are also often the children who experience the most residential moves.

The multivariate analyses in this chapter conceptualize residential mobility and changes in household composition as compounded changes in children's lives that could have different effects on children's outcomes when considered jointly than when examined independently. Controlling for a wide array of baseline covariates representing characteristics of the child, head of household, and household, my models show that both residential mobility and changes in household composition matter for children's educational attainment. I find only weak evidence

for the hypothesis that residential mobility mediates the effect of changes in household composition on high school graduation. Adding a continuous variable for the number of moves a child makes before the age of 15 does not definitively change the relationship between changes and household composition and high school graduation: the magnitude of the coefficients for household change are slightly closer to zero and their confidence intervals are wider in the model including residential mobility, but they are not dramatically different from the coefficients in the model that does not control for residential mobility.

Besides concluding that there is weak evidence for mediation, a different interpretation of the models presented in Table 3.4 is that residential mobility and changes in household composition independently affect the probability of high school graduation even after controlling for many characteristics that predict these changes and the outcome of educational attainment. Research that fails to account for both types of changes is missing a dimension of instability in children's lives that is consequential for their outcomes.

The next set of results consider whether residential mobility and changes in household composition interact in a way such that children experiencing a compounded change are even worse off than children experiencing household change absent a move or residential mobility without changes in household composition. Again, I find only weak evidence for residential mobility as a moderator of the effect of changes in household composition on high school graduation. At first glance, Table 3.5 appears to show that household change only significantly predicts high school graduation when it occurs alongside a move. This, however, is a cursory conclusion that does not account for the very small number of children represented in the categories of household change without a move. The coefficients for change in other household members and joint change among parents and other household members are both negative and

the magnitude is not too different from the corresponding coefficients representing these changes occurring with residential mobility. These change without moving coefficients are less precisely estimated, however, because the groups represent just four and two percent of the sample, respectively. While these results do not demonstrate strong support for my hypothesis of moderation, as with the earlier findings, I take these results to mean that residential mobility and changes in household composition are meaningful disruptions in children's lives that should be considered jointly as well as independently.

As with all research of this nature, the analyses presented in this chapter are subject to certain limitations. One of the more serious limitations is the potential that these models are biased by selection into household change and residential mobility. My models control for a number of the characteristics that previous research shows are associated with household change, moving, and educational attainment, but these disruptions are not randomly assigned and there are likely other confounding variables not accounted for in my models. In Chapter 2 I use inverse probability of treatment weighting and marginal structural models to estimate the effect of changes in household composition on high school graduation. When I compare the weighted results to unweighted results in Chapter 2, my substantive conclusions are the same. This is disappointing, in some respects, given all the work that goes into specifying the prediction models and constructing the weights. On the other hand, this comparison makes me more confident that the unweighted results I present here provide a valid estimate of the effect of these types of household change on high school graduation.

In this chapter I estimate the effects of changes in children's developmental environments on an outcome in young adulthood. If I were instead interested in estimating the effects on shorter-term outcomes such as behavior, health, grades, or other repeatable measures of

102

wellbeing I could approach the question with a different modeling strategy such as fixed effects. Fixed effects models would reduce my concern about selection because they rely on within-person variation to estimate effects and therefore account for time-invariant characteristics of individuals that, if uncontrolled, may bias the estimates. Models of this type would also provide a different and valuable test of the mediation and moderation hypotheses. The variables available every wave in the core survey of the PSID do not allow for this type of analysis, but it is a worthwhile pursuit for future research using different data.

I made a deliberate decision to specify the variables representing an interaction between residential mobility and changes in household composition with lagged indicators of residential mobility. In Appendix I I present results from an alternative specification of Model 3 in Table 3.5 using indicators for the interaction between moving and household composition change that only include individuals who experience these two types of changes in the exact same wave (recall that in the main results these variables represent moves and household changes in the same wave in addition to moves that lead or lag household change by one wave). In this alternative specification, the coefficients for the interacted indicators for household change and residential mobility are all similar in magnitude to the coefficients shown in Table 3.5. They are, however, marginally significant, while the corresponding coefficients in Table 3.5 are all significant at the 95 percent level of confidence. These results are consistent with the fact that the interacted groups in the alternative specification are smaller since the definition of moving with household change is more restrictive. Further, the residual group represented by the "Move Alone" coefficient is more heterogeneous in the alternative specification because it includes children who do not experience any changes in household composition along with children who experience changes in household composition within a year of moving. The specification of

these categories in Model 3 is more internally consistent. Using previous research on the determinants of residential mobility as a guide for the specification of these variables suggests that allowing residential mobility to lead or lag household change by up to a wave is reasonable.

In conclusion, this chapter adds to the household complexity argument advanced in Chapters 1 and 2 by considering an additional source of instability in children's developmental environments: residential mobility. Previous research and my descriptive analyses demonstrate the frequency with which children are exposed to changes in both their household composition and their place of residence. Examining the effect of residential mobility and changes in household composition in isolation does not reflect the reality of how many children experience these changes. My multivariate analyses do not present strong evidence supporting either the hypothesis that residential mobility mediates the effect of household composition change on high school graduation or the hypothesis that residential mobility moderates the effect of household composition change on high school graduation. What these results do suggest, however, is that research endeavoring to determine how disruptions in the lives of children matter for their long-term outcomes should acknowledge the compounded nature of such changes. Attempts to isolate the effect of one change or the other do not capture the lived experience of children and provide an incomplete understanding of how children's contexts affect their wellbeing.

Conclusion

This dissertation argues for a more holistic conceptualization of children's exposure to changes in their residential environments. The empirical chapters present evidence supporting the assertion that children are exposed to many changes in their households beyond the traditional measures of parental relationship dissolution and repartnering, the operationalization of family instability in most previous research. Not only are children exposed to many changes involving extended family members and non-relatives that are not captured by most previous research, these changes have meaningful effects on children's educational attainment. Thus, research that does not account for changes involving extended family members and non-relatives may produce biased estimates of the effects of parental divorce and repartnering on children's outcomes. I also advance a theory of compounded change that explicitly acknowledges that changes in the composition of children's households may prompt residential mobility. I argue that these two types of changes should be modeled in combination, not isolation, given the frequency with which they co-occur.

I begin with a descriptive account of the types of changes in household composition to which children are exposed over a relatively short timeframe. Drawing on data from the Survey of Income and Program Participation, my first conclusion is that previous research limiting its measure of disruption to parents and parents' romantic partners substantially undercounts the number of children exposed to changes in household composition. Chapter 1 shows that the entry and exit of non-parent household members are a substantial source of the changes in household composition that children experience. Changes involving non-parent household members far

exceed the number of changes in parental figures to which children are exposed. This finding suggests that research focusing narrowly on parental relationship changes misses a large number of the changes in household composition that children experience.

Chapter 1 presents two additional descriptive findings about children's exposure to changes in household composition. The first is that there are striking differences in exposure to changes involving non-parent, non-sibling relatives by race and ethnicity. Over twice the proportion of black and Hispanic children experience the entry or departure of an "other" relative over the span of two years compared to white children. The second finding is that despite changes in the patterns of marriage, childbearing, and cohabitation that might suggest increases in children's exposure to changes in household composition, in the 1990s and 2000s fewer children were exposed to changes in household composition than in the 1980s.

Chapter 2 takes up the charge of determining whether the experience of household instability involving non-parent, non-sibling relatives and non-relatives during childhood has significant effects on one outcome in young adulthood, high school graduation. To the extent that changes involving household members other than parents are consequential for children's outcomes, research not accounting for such changes is missing a substantial part of the instability to which children are exposed. I track changes in children's households from birth until age 15 and use those changes to predict the probability of high school graduation with inverse probability of treatment weighting and marginal structural models. We learn in Chapter 2 that children who experience changes involving parents and children who experience changes involving non-parent household members are both significantly less likely to graduate from high school compared to children who experience neither of these changes in household composition during childhood. Descriptively, nearly 20 percent of children experience changes involving

non-parent relatives but do not experience any changes involving parents; these children are counted as having stable families according to the conventional mode of operationalizing family instability, yet the findings in Chapter 2 show that even without experiencing change involving parents, children are predicted to be disadvantaged as a result of changes in household composition. These findings have implications for research conceptualizing family instability solely as changes involving parents and parents' romantic partners as the stable group to which children experiencing such changes are compared includes children who do not have stable households.

The analyses in Chapter 3 support the second theoretical contribution of the dissertation. Experiencing residential mobility at the same time as a change in household composition is a common occurrence among children: nearly 40 percent of the sample experienced what I refer to as a compounded change at least once across 15 years. Models testing whether residential mobility mediates or moderates the effect of changes in household composition on high school graduation do not return strong support for either hypothesis. Rather these models suggest that residential mobility and changes in household composition have independent and joint effects on the probability of high school graduation. Research estimating the effects of household complexity and instability on children's outcomes should account for both types of changes, and the likelihood that they co-occur, in children's residential environments.

This dissertation makes a theoretical contribution to the literature on family instability, arguing that instability in children's residential arrangements is better captured by the concept of household complexity, accounting for parents and non-parent household members, rather than the traditional definition of family instability. Chapter 2 additionally makes a methodological contribution to the literature by employing a method that facilitates causal inference, addressing

limitations of prior research that did not account for potential bias as a result of dynamic selection. Finally, this dissertation advances a theory of compounded change in children's residential environments, asserting the importance of considering both residential mobility and changes in children's household composition as meaningful disruptions in childhood predicting longer-term outcomes.

The findings presented in this dissertation should stimulate many questions for further research. I conceptualize residential mobility and changes in household composition as indicators of volatility in children's lives. Though they are markers of disruption in and of themselves, it would be fruitful in future research to isolate particular types of moves and changes in household structure to identify the effects of more specific changes. For example, we might hypothesize that a child whose grandmother moves into his household in part to provide additional caregiving could realize a very different outcome as a result compared to a child whose uncle cycles in and out of the household because of his own unstable housing arrangements. As I have measured it, these two children are both categorized as experiencing household changes involving non-parent, non-sibling relatives, underscoring the fact that this may be a very heterogeneous group.

Incorporating characteristics of mobile household members including their age, employment, education, income, precise relation, housing history, and incarceration history could help scholars identify situations in which children may be benefitted by additional caregivers and supervision at home versus scenarios that put them at particular risk of disadvantage down the line. A complementary suggestion for future research is to broaden the outcomes considered. It was important to me to assess the effects of household complexity and instability on a long-term outcome like high school graduation, a major point of stratification in the United States. That residential mobility and changes in household composition have a

negative effect on high school graduation does not necessarily mean that these changes are detrimental in other domains of children's wellbeing and attainment. Determining shorter-term effects of these changes could prove useful in identifying mechanisms connecting household instability during childhood with high school graduation and other young adult outcomes. And assessing the effects on other outcomes such as employment, risky behavior, and contact with the criminal justice system could provide further evidence on the importance of accounting for non-parental household members and the co-occurrence of residential mobility and changes in household composition in future research. The decisions about how to model the relationship between household instability and long-term outcomes, and which outcomes to model, are constrained to some degree by available data. The SIPP and the PSID allow for the construction of detailed household rosters at relatively frequent intervals, but their focus on households and heads of households makes them less conducive to assessing the effects of household instability on short-term child wellbeing.

Having richer descriptions of the families and households in which children are exposed to the most volatility would be useful in contextualizing these results. Qualitative data may be especially useful here. Using large, nationally representative quantitative samples, this dissertation provides evidence that residential mobility and changes in household composition reduce the probability of high school graduation. Qualitative data generated by spending time with children and other members of particularly complex and unstable households could shed light on the forces that prompt instability and how children cope with and are buffered from disruption.

In sum, this dissertation contributes theoretically and methodologically to the rich literature on family instability and children's outcomes. I argue for the reconceptualization of

family instability to account for changes in household composition involving other members of children's households beyond their parents. Further, I demonstrate the value of considering children's exposure to compounded changes in their residential arrangements rather than isolating different types of changes and estimating their effects independently. There are many fruitful directions for future research extending from the findings presented in this dissertation, all of which will help to provide a more complete picture of the forces in children's lives that help and hinder their development into young adults.

Appendix A

Detailed Relationships and Aggregate Relationship Categories in the SIPP

Table A.1 SIPP Relationship Categorization

Aggregate Category	Detailed Relationship
Mother	Mother
	Step-mother
Father	Father
	Step-father
Other Relative	Grandparent
	Aunt
	Uncle
	Cousin
	Nephew
	Niece
	Brother-in-law
	Sister-in-law
Non-relative	Housemate/Roommate
	Friend
	Roomer/Boarder
	Cohabiting partner of relative
	Foster parent

Appendix B

The Value of Frequent Data Collection

The SIPP is unusual among longitudinal studies in the frequency with which it surveys households. The 1984-2008 panels of the SIPP collected data from households every four months and a complete household roster was recorded at each wave of data collection. This enables me to capture changes in household composition that may be missed by longitudinal studies with less frequent contact with respondents. The National Longitudinal Survey of Youth 1979 and the Panel Study of Income Dynamics were both initially annual surveys that now collect data from households every two years, potentially missing changes occurring between waves. The Fragile Families and Child Wellbeing Study, a commonly-used dataset for examining children's developmental environments and consequences of family instability, records information about children's living environments at birth, ages one, three, five, nine and 15. The study design, with multi-year gaps between waves, suggests that this survey may not fully capture changes in children's household composition beyond parental romantic transitions, which are reported retrospectively.

To check whether the frequency of data collection affects my measures of exposure to household change, I compare the cumulative percentage of children experiencing various types of household change when measured every four months to an annual measure of exposure to household change that I construct by matching every third wave of data collection in the 1984, 1996 and 2008 panels. Table B.1 shows cumulative percentages of children who experienced household changes over two years estimated with the annual measure and the four-month

measure. In the 1984 panel, the ratio of the annual measure of household change to the more

frequent four-month measure is 0.81 on average across types of changes. After two years, the

annual measure shows that 3.42 percent of children have experienced a father figure leaving their

household, compared to the four-month measure, which shows 4.08 percent of children have

experienced this change, a ratio of 0.84. Annual measures from the 1984 panel generally capture

an even lower proportion of the children exposed to the entries and exits of other relatives and

non-relatives.

On average across types of household change in the 1996 panel, the ratio of annual

measures to four-month measures is 0.83. Yet only for father exits is the ratio of the annual

measure to the four-month measure above 0.90. The annual measure misses approximately a

quarter of the exposure to other relatives and non-relatives joining the household captured by the

four-month measure (with a ratio of annual to four-month measure of approximately 0.75).

Overall in the 2008 panel the ratio of the annual measures to their respective four-month

measures is 0.83. In the 2008 panel the annual measure of fathers leaving and joining the

household is a closer match to the four-month measure than the other categories of change,

especially the indicator for a non-relative joining the household, for which the ratio of the annual

measure to the four-month measure is only 0.78.

My comparison between the four-month measure and the annual measure of children's

exposure to household change shows that the annual measure misses a substantial proportion of

the children who are exposed to various types of changes in household composition. This

suggests that some of the changes in household composition that children experience are

temporary. Shorter durations within or outside of the children's households are captured by the

four-month measure but missed by the annual measure. To the extent that it is disruption that is

consequential to children's wellbeing, the four-month measure does a better job of accounting for all of the disruption children experience from changes in the people with whom they live. Surveys with more frequent data collection are more expensive to administer and place a greater burden on respondents, but they provide information that surveys in which more time elapses between waves are unable to provide.

Table B.1. Cumulative percentage of children experiencing change after two years, annual and four-month measure, and ratio of annual to four-month measure, by SIPP panel

| | 1984 | | | 1996 | | | 2008 | | |
Type of Change	Annual	Four-Month	Annual/Four-Month Ratio	Annual	Four-Month	Annual/Four-Month Ratio	Annual	Four-Month	Annual/Four-Month Ratio
Mother Left	1.25	1.22	1.02	0.71	0.81	0.88	1.06	1.26	0.84
Mother Joined	0.61	0.66	0.92	0.41	0.53	0.77	0.49	0.65	0.75
Father Left	3.42	4.08	0.84	3.35	3.64	0.92	3.15	3.45	0.91
Father Joined	2.45	2.99	0.82	2.43	2.77	0.88	1.84	2.16	0.85
Other Relative Left	7.61	9.36	0.81	6.24	7.9	0.79	6.38	7.33	0.87
Other Relative Joined	6.06	7.95	0.76	5.28	7.27	0.73	5.47	6.72	0.81
Non-relative Left	1.83	2.92	0.63	2.95	3.38	0.87	2.52	3.12	0.81
Non-relative Joined	2.42	3.45	0.70	2.36	3.07	0.77	2.62	3.38	0.78
Average Ratio			0.81			0.83			0.83

115

Appendix C

Detailed Relationships and Aggregate Relationship Categories in the PSID

Table C.1 PSID Relationship Categorization

Aggregate Category	Pre-1983 Detailed Relationship	Post-1983 Detailed Relationship
Mother	Mother / Step-mother	Mother
		Step-mother
Father	Father / Step-father	Father
		Step-father
Other Relative	Grandparent	Grandparent
	Aunt	Aunt / Step-aunt
	Uncle	Uncle / Step-uncle
	Nephew	Cousin / Step-cousin
	Niece	Nephew
	Other Relative / In Law	Niece
		Brother-in-law
		Sister-in-law
		Other Relative
Non-relative	Non-relative	Housemate/Roommate
		Friend
		Roomer/Boarder
		Cohabiting partner of relative
		Relative of cohabiter
		Foster parent
		Non-relative

Appendix D

Logit Models Predicting High School Graduation with Changes in Household

Composition:

No Inverse Probability of Treatment Weight

Table D.1. Household Composition Change and High School Graduation (no IPTW)

	Coefficient	95% Confidence Interval
Full Sample		
Change in parents	-0.371*	[-0.721, 0.22]
Change in other household members	-0.532**	[-0.860, -0.204]
Change in both	-0.425*	[-0.756, -0.093]
Observations	3,765	
Among White Children		
Change in parents	-0.373+	[-0.761, 0.015]
Change in other household members	-0.717***	[-1.099, -0.334]
Change in both	-0.474*	[-0.867, -0.080]
Observations	1,999	
Among Black Children		
Change in parents	0.106	[-0.639, 0.851]
Change in other household members	0.114[a]	[-0.456, 0.684]
Change in both	0.072	[-0.518, 0.662]
Observations	1,642	

*** p<0.01, ** p<0.01, * p<0.05, + p<0.10

[a] Significantly different than white children, p<0.05

Logit Models Predicting High School Graduation with Changes in Household

Composition:

Counts of Household Changes

Table E.1. Household Composition Change and High School Graduation, Count Specification

	Coefficient	95% Confidence Interval
Full Sample		
Change in parents	-0.139+	[-0.288, 0.010]
Change in other household members	-0.018	[-0.107, 0.071]
Change in both	-0.005	[-0.289, 0.279]
Observations	3,763	
Among White Children		
Change in parents	-0.157+	[-0.344, 0.030]
Change in other household members	-0.114+	[-0.243, 0.015]
Change in both	0.259	[-0.188, 0.706]
Observations	1,999	
Among Black Children		
Change in parents	-0.073	[-0.313, 0.167]
Change in other household members	0.094+[a]	[-0.008, 0.195]
Change in both	-0.270[b]	[-0.644, 0.104]
Observations	1,642	

+ p<0.1

Significantly different than white children, [a] p<0.01, [b] p<0.10

Residential Mobility Indicator Assignment Process

I start with 123,212 child-wave observations representing the 14,951 individuals present in the

PSID at age zero or one, from whom my sample of 5,024 individuals is drawn. The final sample

of 5,024 individuals were present in PSID households at each wave of data collection from ages

1 to 15. The balance (9,927 individuals) attrited from the survey or missed one or more waves of

data collection. Because I do not have a complete history of their residential mobility or

household roster I exclude them from my sample.

This is the process I followed to assign residential mobility in each wave (beginning with

123,212 child-wave observations):

1. Move variable set to 0 in first year child appears in survey. (14,951 observations)

2. Move variable set to 0 if household head reported no move, household head lived with

   child in prior wave, and prior wave census tract is the same as current wave census tract.

   (73,580 observations)

3. Move variable set to 0 if household head reported no move, and household head lived

   with child in prior wave, but prior wave census tract differs from current wave census

   tract (privileging the survey response over geocoding). (4,934 observations)

4. Move variable set to 1 if household head reported a move, household head lived with child in prior wave, and prior wave census tract differs from current wave census tract. (17,775 observations)

5. Move variable set to 1 if household head reported a move, and household head lived with child in prior wave, but prior wave census tract does not differ from current wave census tract (this captures short-distance moves and/or imprecise geocodes). (8,539 observations)

6. Move variable set to 1 if household head did not live with child in prior wave (household head report is adjusted to missing), prior wave census tract differs from current wave census tract, and prior wave and current wave geocode match level are both at the most precise (street) level. (1,426 observations)

7. Move variable set to 1 if household head did not live with child in prior wave, prior wave census tract differs from current wave census tract, and prior wave state of residence differs from current wave state of residence (this identifies moves even when geocoding was imprecise – match level differs from prior to current wave – and perhaps not reliable). (126 observations)

8. Move variable set to 0 if household head did not live with child in prior wave and prior wave census tract is the same as current wave census tract. (1,470 observations)

9. Move variable set to 0 if household head lived with child in prior wave but responded that he "did not know" whether he moved since last interview and prior wave census tract is the same as current wave census tract. (28 observations)

10. Move variable set to 1 if household head did not live with child in prior wave, prior wave census tract differs from current wave census tract, and geocode match level is the same

in prior and current wave (i.e., prior wave and current wave geocode match were both at the ZIP code level). (49 observations)

11. Move variable set to 1 if household head did not live with child in prior wave, census tract two waves prior differs from current wave census tract, geocode match level is the same in two waves prior and current wave, and move variable missing in immediately prior wave. (6 observations)

Total: 122,884 observations assigned out of 123,212 total, 99.7% or 0.27% missing

For many of the remaining missing cases the household head did not live with the child at prior and current waves and the geocode match level was "street" at one wave and "ZIP" at the other. This means that even if the geocode assignment suggests a move between waves, it could be an imprecise geocode and not be a real move. Even where the census tract is in a different county from prior wave to current wave I did not want to assume a move occurred since ZIP codes can cross county lines.

Appendix G

Residential Mobility Mediating Models:

Logit Model Coefficients Predicting High School Graduation, Categorical Move Variable

Table G.1. Mediating Models: Logit Model Coefficients Predicting High School Graduation

	HH Change (No Move)	HH Change and Move (Categorical)
Household Change Indicators		
Change in Parents	-0.371*	-0.305+
	(0.178)	(0.178)
Change in Other Household Members	-0.532**	-0.455**
	(0.167)	(0.172)
Joint Change Parents and Other Household Members	-0.425*	-0.324+
	(0.169)	(0.175)
Move (reference = 0 moves)		
One or two moves		-0.185
		(0.182)
Three or more moves		-0.425*
		(0.188)
Child Sex (female=1)	0.305**	0.317**
	(0.113)	(0.113)
Baseline Characteristics		
Child Lives with Married Parents	-0.052	-0.019
	(0.290)	(0.291)
Characteristics of Head of Household		
Sex (female=1)	-0.449	-0.475
	(0.449)	(0.445)
Age	-0.011	-0.014
	(0.009)	(0.009)
Race/Ethnicity (reference = White)		
Black	0.090	0.071
	(0.163)	(0.165)
Hispanic	-0.345	-0.342
	(0.283)	(0.278)
Other	1.305+	1.285+
	(0.67)	(0.67)
Education (reference = High School Diploma)		
Less Than High School	-0.644***	-0.625***
	(0.144)	(0.144)
Some College	0.089	0.095
	(0.172)	(0.172)
Bachelors or More	0.255	0.263
	(0.199)	(0.199)

Table G.1 (Continued)

Employment (reference = Employed)		
Unemployed	0.408	0.416
	(0.269)	(0.267)
Retired/Disabled	0.269	0.234
	(0.391)	(0.389)
Marital Status (reference = Married)		
Single	0.249	0.206
	(0.503)	(0.499)
Widowed, Divorced, Separated	0.196	0.185
	(0.477)	(0.472)
Characteristics of Household		
Housing Tenure (reference = Owned)		
Rented	-0.326*	-0.228+
	(0.132)	(0.137)
Neither Owned nor Rented	-0.804***	-0.739**
	(0.219)	(0.222)
Income below Poverty Line	-0.405*	-0.380*
	(0.179)	(0.181)
Household Size	-0.032	-0.029
	(0.055)	(0.056)
Number of Children in Household	-0.002	-0.015
	(0.068)	(0.069)
Year	-0.003	-0.003
	(0.008)	(0.008)
Constant	8.614	9.27
	(15.35)	(15.38)
Observations	3765	3765

Robust standard errors in parentheses, *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

Residential Mobility as Moderator with Combined Household Change Indicator

Table H.1. Moderating Models: Logit Model Coefficients Predicting High School Graduation

	Model 3	Aggregated Household Change
Household Change Indicators		
Change in Parents	0.104	
	(0.510)	
Change in Other Household Members	-0.308	
	(0.385)	
Joint Change Parents and Other Household Members	-0.625	
	(0.447)	
Household Change without Move		-0.315
		(0.294)
Change in Parents and Move	-0.665*	-0.660*
	(0.275)	(0.276)
Change in Other Household Members and Move	-0.640*	-0.626*
	(0.259)	(0.260)
Joint Change and Move	-0.537*	-0.522*
	(0.259)	(0.258)
Move Alone	-0.393+	-0.389+
	(0.225)	(0.225)
Child Sex (female=1)	0.308**	0.311**
	(0.113)	(0.113)
Baseline Characteristics		
Child Lives with Married Parents	0.012	0.029
	(0.292)	(0.292)
Characteristics of Head of Household		
Sex (female=1)	-0.479	-0.486
	(0.445)	(0.444)
Age	-0.014	-0.014
	(0.009)	(0.009)
Race/Ethnicity (reference = White)		
Black	0.081	0.072
	(0.165)	(0.165)
Hispanic	-0.349	-0.370
	(0.282)	(0.279)
Other	1.3264+	1.275+
	(0.66)	(0.66)

Table H.1 (Continued)

Education (reference = High School Diploma)		
Less Than High School	-0.659***	-0.662***
	(0.143)	(0.143)
Some College	0.112	0.115
	(0.173)	(0.172)
Bachelors or More	0.309	0.312
	(0.199)	(0.199)
Employment (reference = Employed)		
Unemployed	0.383	0.396
	(0.269)	(0.269)
Retired/Disabled	0.239	0.24
	(0.392)	(0.392)
Marital Status (reference = Married)		
Single	0.182	0.191
	(0.499)	(0.498)
Widowed, Divorced, Separated	0.138	0.145
	(0.475)	(0.473)
Characteristics of Household		
Housing Tenure (reference = Owned)		
Rented	-0.269*	-0.273*
	(0.134)	(0.135)
Neither Owned nor Rented	-0.771***	-0.789***
	(0.219)	(0.220)
Income below Poverty Line	-0.392*	-0.381*
	(0.181)	(0.182)
Household Size	-0.041	-0.045
	(0.055)	(0.055)
Number of Children in Household	-0.012	-0.007
	(0.068)	(0.068)
Year	-0.004	-0.004
	(0.008)	(0.008)
Constant	10.60	9.89
	(15.49)	(15.41)
Observations	3765	3765

Robust standard errors in parentheses, *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

Residential Mobility as Moderator with Simultaneous Move and Household Change

Indictors:

No Lagged Variables

Table I.1. Moderating Models: Logit Model Coefficients Predicting High School Graduation

	Model 3: no lag	Aggregated Household Change
Household Change Indicators		
Change in Parents	0.111	
	(0.511)	
Change in Other Household Members	-0.279	
	(0.386)	
Joint Change Parents and Other Household Members	-0.579	
	(0.449)	
Household Change without Move		-0.286
		(0.294)
Change in Parents and Move	-0.512+	-0.507+
	(0.288)	(0.288)
Change in Other Household Members and Move	-0.460+	-0.446+
	(0.263)	(0.263)
Joint Change and Move	-0.483+	-0.471+
	(0.266)	(0.265)
Move Alone	-0.477*	-0.472*
	(0.223)	(0.223)
Child Sex (female=1)	0.307**	0.310**
	(0.112)	(0.112)
Baseline Characteristics		
Child Lives with Married Parents	0.05	0.065
	(0.292)	(0.291)
Characteristics of Head of Household		
Sex (female=1)	-0.523	-0.531
	(0.444)	(0.443)
Age	-0.014	-0.014
	(0.009)	(0.009)
Race/Ethnicity (reference = White)		
Black	0.070	0.062
	(0.166)	(0.166)
Hispanic	-0.337	-0.356
	(0.281)	(0.279)
Other	1.219+	1.230+
	(0.663)	(0.661)

Table I.1 (Continued)

Education (reference = High School Diploma)		
Less Than High School	-0.673***	-0.675***
	(0.143)	(0.143)
Some College	0.122	0.125
	(0.173)	(0.172)
Bachelors or More	0.345+	0.347+
	(0.199)	(0.199)
Employment (reference = Employed)		
Unemployed	0.369	0.382
	(0.268)	(0.268)
Retired/Disabled	0.267	0.269
	(0.392)	(0.392)
Marital Status (reference = Married)		
Single	0.210	0.218
	(0.499)	(0.498)
Widowed, Divorced, Separated	0.171	0.178
	(0.473)	(0.472)
Characteristics of Household		
Housing Tenure (refrence = Owned)		
Rented	-0.282*	-0.286*
	(0.134)	(0.134)
Neither Owned nor Rented	-0.783***	-0.801***
	(0.218)	(0.219)
Income below Poverty Line	-0.399*	-0.389*
	(0.181)	(0.182)
Household Size	-0.051	-0.054
	(0.056)	(0.056)
Number of Children in Household	-0.004	-0.001
	(0.069)	(0.069)
Year	-0.005	-0.004
	(0.008)	(0.008)
Constant	12.34	11.69
	(15.47)	(15.40)
Observations	3765	3765

Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

References

Amato, Paul R. and Jacob Cheadle. 2005. "The Long Reach of Divorce: Divorce and Child Well-Being across Three Generations." *Journal of Marriage and Family* 67(1):191-206.

Andersson, Gunnar. 2004. "Children's Experience of Family Disruption and Family Formation: Evidence from 16 Ffs Countries." *Demographic Research*, Volume 7 7:343-64.

Aquilino, William S. 1996. "The Life Course of Children Born to Unmarried Mothers: Childhood Living Arrangements and Young Adult Outcomes." *Journal of Marriage and the Family* 58(2):293-310.

Astone, Nan Marie and Sara S. McLanahan. 1994. "Family Structure, Residential Mobility, and School Dropout: A Research Note." *Demography* 31(4):575-84.

Bachtell, Kate, Ned English and Catherine Haggerty. 2012. "Tracking Mobility at the Household Level." *Cityscape: A Journal of Policy Development and Research* 14(3):91-114.

Beck, Audrey N., Carey E. Cooper, Sara McLanahan and Jeanne Brooks-Gunn. 2010. "Partnership Transitions and Maternal Parenting." *Journal of Marriage and Family* 72(2):219-33.

Bengtson, Vern L. 2001. "Beyond the Nuclear Family: The Increasing Importance of Multigenerational Bonds." *Journal of Marriage and Family* 63(1):1-16.

Brown, Susan L. 2006. "Family Structure Transitions and Adolescent Well-Being." *Demography* 43(3):447-61.

Brown, Susan L., J. Bart Stykes and Wendy D. Manning. 2016. "Trends in Children's Family Instability, 1995-2010." *Journal of Marriage and Family* 78(5):1173-83.

Cavanagh, Shannon E. 2008. "Family Structure History and Adolescent Adjustment." *Journal of Family Issues* 29(7):944-80.

Cavanagh, Shannon E. and Aletha C. Huston. 2006. "Family Instability and Children's Early Problem Behavior." *Social Forces* 85(1):551-81.

Chase-Lansdale, P. Lindsay, Jeanne Brooks Gunn and Elise S. Zamsky. 1994. "Young African-American Multigenerational Families in Poverty - Quality of Mothering and Grandmothering." *Child Development* 65(2):373-93.

Cherlin, Andrew J., Kathleen E. Kiernan and P. Lindsay Chase-Lansdale. 1995. "Parental Divorce in Childhood and Demographic Outcomes in Young Adulthood." *Demography* 32(3):299-318.

Cohen, Philip N. and Lynne M. Casper. 2002. "In Whose Home? Multigenerational Families in the United States, 1998-2000." *Sociological Perspectives* 45(1):1-20.

Coleman, James S. 1988. "Social Capital in the Creation of Human Captial." *American Journal of Sociology* 94(Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure):S95-S120.

Condliffe, Barbara , Siri Warkentien and Stefanie DeLuca. 2014. "Shaken Up? Understanding How Family Instability Can Harm or Help Children." Paper presented at the American Sociological Association, New York.

Copen, Casey E, Kimberly Daniels, Jonathan Vespa and William D Mosher. 2012. "First Marriages in the United States: Data from the 2006–2010 National Survey of Family Growth." National Health Statistics Reports 49(March 22).

DeLeire, Thomas and Ariel Kalil. 2002. "Good Things Come in Threes: Single-Parent Multigenerational Family Structure and Adolescent Adjustment." *Demography* 39(2):393-413.

Desmond, Matthew and Kristin L. Perkins. 2016. "Housing and Household Instability." *Urban Affairs Review* 52(3):421-36

Edin, Kathryn and Maria Kefalas. 2005. *Promises I Can Keep: Why Poor Women Put Motherhood before Marriage.* Berkeley: University of California Press.

Fomby, Paula and Andrew J. Cherlin. 2007. "Family Instability and Child Well-Being." *American Sociological Review* 72(2):181-204.

Fomby, Paula, Stefanie Mollborn and Christie A. Sennott. 2010. "Race/Ethnic Differences in Effects of Family Instability on Adolescents' Risk Behavior." *Journal of Marriage and Family* 72(2):234-53.

Fomby, Paula and Cynthia Osborne. 2010. "The Influence of Union Instability and Union Quality on Children's Aggressive Behavior." *Social Science Research* 39(6):912-24.

Foster, E. Michael and Ariel Kalil. 2007. "Living Arrangements and Children's Development in Low-Income White, Black, and Latino Families." *Child Development* 78(6):1657-74

Fowler, Patrick J., David B. Henry, Michael Schoeny, Jeremy Taylor and Dina Chavira. 2014. "Developmental Timing of Housing Mobility: Longitudinal Effects on Externalizing Behaviors among at-Risk Youth." *Journal of the American Academy of Child and Adolescent Psychiatry* 53(2):199-208.

Freudenberg, Nicholas and Jessica Ruglis. 2007. "Reframing School Dropout as a Public Health Issue." *Prev Chronic Dis* 4(4):A107.

Geist, Claudia and Patricia A. McManus. 2008. "Geographical Mobility over the Life Course: Motivations and Implications." *Population, Space and Place* 14:283-303.

Gilman, Stephen E., Ichiro Kawachi, Garrett M. Fitzmaurice and Stephen L. Buka. 2003. "Socio-Economic Status, Family Disruption and Residential Stability in Childhood: Relation to

Onset, Recurrence and Remission of Major Depression." *Psychological Medicine* 33(8):1341-55.

Glick, Jennifer E. and Jennifer Van Hook. 2011. "Does a House Divided Stand? Kinship and the Continuity of Shared Living Arrangements." *Journal of Marriage and Family* 73(5):1149-64.

Goldstein, Joshua R. and Catherine T. Kenney. 2001. "Marriage Delayed or Marriage Forgone? New Cohort Forecasts of First Marriage for Us Women." *American Sociological Review* 66(4):506-19.

Guzzo, Karen Benjamin. 2014. "Trends in Cohabitation Outcomes: Compositional Changes and Engagement among Never-Married Young Adults." *Journal of Marriage and Family* 76(4):826-42.

Harvey, Hope. 2015. "When Mothers Can't 'Pay the Cost to Be the Boss': Roles and Identity within Doubled-up Households." Paper presented at the American Sociological Association, Chicago.

Haveman, Robert, Barbara Wolfe and James Spaulding. 1991. "Childhood Events and Circumstances Influencing High School Completion." *Demography* 28(1):133-57.

Haynie, Dana L., Scott J. South and Sunita Bose. 2006. "Residential Mobility and Attempted Suicide among Adolescents: An Individual-Level Analysis." *Sociological Quarterly* 47(4):693-721.

Jelleyman, T. and N. Spencer. 2008. "Residential Mobility in Childhood and Health Outcomes: A Systematic Review." *Journal of Epidemiology and Community Health* 62:584-92.

Kennedy, Sheela and Steven Ruggles. 2014. "Breaking up Is Hard to Count: The Rise of Divorce in the United States, 1980-2010." *Demography* 51(2):587-98.

Kim, Hyun Sik. 2011. "Consequences of Parental Divorce for Child Development." *American Sociological Review* 76(3):487-511.

Kreider, Rose Marie and Renee Ellis. 2011. *Number, Timing, and Duration of Marriages and Divorces, 2009*. US Department of Commerce, Economics and Statistics Administration, US Census Bureau.

Lee, Dohoon and Sara McLanahan. 2015. "Family Structure Transitions and Child Development: Instability, Selection, and Population Heterogeneity." *American Sociological Review* 80(4):738-63.

London, Rebecca A. and Robert W. Fairlie. 2006. "Economic Conditions and Children's Living Arrangements." Pp. 233-62 in *Working and Poor: How Economic and Policy Changes Are Affecting Low-Wage Workers*, edited by R. M. Blank, S. H. Danziger and R. F. Schoeni. New York: Russell Sage Foundation.

Manning, Wendy D. 2013. "Trends in Cohabitation: Over Twenty Years of Change, 1987-2010." Vol. NCFMR Family Profiles. National Center for Family & Marriage Research, Bowling Green State University.

Manning, Wendy D., Susan L. Brown and J. Bart Stykes. 2014. "Family Complexity among Children in the United States." *Annals of the American Academy of Political and Social Science* 654(1).

Martin, Joyce A., Brady E. Hamilton, Michelle J. Osterman, Sally C. Curtin and T. J. Matthews. 2015. "Births: Final Data for 2013." Natl Vital Stat Rep 64(1):1-65.

Martin, Steven P. 2006. "Trends in Marital Dissolution by Women's Education in the United States." *Demographic Research* 15:537-59.

McLanahan, Sara. 2011. "Family Instability and Complexity after a Nonmarital Birth: Outcomes for Children in Fragile Families." Pp. 108-133 in *Social Class and Changing Families in an Unequal America*, edited by M. J. Carlson and P. England. Stanford, California: Stanford University Press.

McLanahan, Sara and Gary Sandefur. 1994. *Growing up with a Single Parent: What Helps, What Hurts.* Cambridge: Harvard University Press.

Mitchell, Katherine Stamps. 2013. "Pathways of Children's Long-Term Living Arrangements: A Latent Class Analysis." *Social Science Research* 42(5):1284-96.

Mollborn, Stefanie. 2016. "Young Children's Developmental Ecologies and Kindergarten Readiness." *Demography* 53(6):1853-82.

Mollborn, Stefanie, Paula Fomby and Jeff A. Dennis. 2011. "Who Matters for Children's Early Development? Race/Ethnicity and Extended Household Structures in the United States." *Child Indicators Research* 4(3):389-411.

Mollborn, Stefanie, Paula Fomby and Jeff A. Dennis. 2012. "Extended Household Transitions, Race/Ethnicity, and Early Childhood Cognitive Outcomes." *Social Science Research* 41(5):1152-65.

Musick, Kelly and Katherine Michelmore. 2015. "Change in the Stability of Marital and Cohabiting Unions Following the Birth of a Child." *Demography* 52(5):1463-85.

Mutchler, Jan E. and Lindsey A. Baker. 2009. "The Implications of Grandparent Coresidence for Economic Hardship among Children in Mother-Only Families." *Journal of Family Issues* 30(11):1576-97.

Oreopoulos, Philip. 2007. "Do Dropouts Drop out Too Soon? Wealth, Health and Happiness from Compulsory Schooling." *Journal of Public Economics* 91(11-12):2213-29.

Perkins, Kristin L. and Robert J. Sampson. 2015. "Compounded Deprivation in the Transition to Adulthood: The Intersection of Racial and Economic Inequality among Chicagoans, 1995–2013." *RSF* 1(1):35-54.

Pilkauskas, Natasha V. 2012. "Three-Generation Family Households: Differences by Family Structure at Birth." *Journal of Marriage and Family* 74(5):931-43.

Quillian, Lincoln. 2003. "How Long Are Exposures to Poor Neighborhoods? The Long-Term Dynamics of Entry and Exit from Poor Neighborhoods." *Population Research and Policy Review* 22(3):221-49.

Raley, R. Kelly and Elizabeth Wildsmith. 2004. "Cohabitation and Children's Family Instability." *Journal of Marriage and Family* 66(1):210-19.

Raviv, Amiram, Giora Keinan, Yehuda Abazon and Alona Raviv. 1990. "Moving as a Stressful Life Event for Adolescents." *Journal of Community Psychology* 18(2):130-40.

Robins, James M., Miguel Angel Hernan and Babette Brumback. 2000. "Marginal Structural Models and Causal Inference in Epidemiology." *Epidemiology* 11(5):550-60.

Rumberger, Russell W. 1987. "High-School Dropouts - a Review of Issues and Evidence." *Review of Educational Research* 57(2):101-21.

Sarkisian, Natalia and Naomi Gerstel. 2004. "Kin Support among Blacks and Whites: Race and Family Organization." *American Sociological Review* 69:812-37.

Schachter, Jason P. 2004. "Geographical Mobility: 2002 to 2003." Vol. Current Population Reports. Washington, D.C.: U.S. Census Bureau.

Schoen, Robert and Vladimir Canudas-Romo. 2006. "Timing Effects on Divorce: 20th Century Experience in the United States." *Journal of Marriage and Family* 68(3):749-58.

Simpson, Gloria A. and Mary Glenn Fowler. 1994. "Geographic Mobility and Children's Emotional/Behavioral Adjustment and School Functioning." *Pediatrics* 93(2):303-9.

Solari, Claudia D. and Robert D. Mare. 2012. "Housing Crowding Effects on Children's Wellbeing." *Social Science Research* 41(2):464-76.

South, Scott J. and Kyle D. Crowder. 1997. "Escaping Distressed Neighborhoods: Individual, Community and Metropolitan Influences." *American Journal of Sociology* 102(4):1040-84.

South, Scott J., Dana L. Haynie and Sunita Bose. 2005. "Residential Mobility and the Onset of Adolescent Sexual Activity." *Journal of Marriage and Family* 67(2):499-514.

South, Scott J. , Dana L. Haynie and Sunita Bose. 2007. "Student Mobility and School Dropout." *Social Science Research* 36:68-94.

Sun, Yongmin M. and Yuanzhang Z. Li. 2014. "Alternative Households, Structural Changes, and Cognitive Development of Infants and Toddlers." *Journal of Family Issues* 35(11):1440-72.

Tucker, C. Jack, Jonathan Marx and Larry Long. 1998. ""Moving On": Residential Mobility and Children's School Lives." *Sociology of Education* 71(2):111-29.

Upchurch, Dawn M., Lee A. Lillard and Constantijn W. A. Panis. 2002. "Nonmarital Childbearing: Influences of Education, Marriage, and Fertility." *Demography* 39(2):311-29.

Verropoulou, Georgia, Heather Joshi and Richard D. Wiggins. 2002. "Migration, Family Structure and Children's Well-Being: A Multi-Level Analysis of the Second Generation of the 1958 Birth Cohort Study." *Children & Society* 16(4):219-31.

Vespa, Jonathan, Jamie M. Lewis and Rose M. Kreider. 2013. "America's Families and Living Arrangements: 2012." Vol. Current Population Reports. Washington, D.C.: U.S. Census Bureau.

Vogel, Matt, Lauren C Porter and Timothy McCuddy. 2017. "Hypermobility, Destination Effects, and Delinquency: Specifying the Link between Residential Mobility and Offending." *Social Forces* 95(3):1261-84.

Warkentien, Siri, Barbara Condliffe and Stefanie DeLuca. 2013. "Measuring Family Complexity in Low-Income African American Families." Paper presented at the American Sociological Association, New York.

Wodtke, Geoffrey T., David J. Harding and Felix Elwert. 2011. "Neighborhood Effects in Temporal Perspective: The Impact of Long-Term Exposure to Concentrated Disadvantage on High School Graduation." *American Sociological Review* 76(5):713-36.

Wu, Lawrence L. 1996. "Effects of Family Instability, Income, and Income Instability on the Risk of a Premarital Birth." *American Sociological Review* 61(3):386-406.

Ziol-Guest, Kathleen M. and Claire C. McKenna. 2014. "Early Childhood Housing Instability and School Readiness." *Child Development* 85(1):103-13.