

HOUSING INSECURITY AMONG TEENAGE MOTHERS

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Abstract

Descent, affordable housing is foundational to physical and psychological health. Despite the growing interest in understanding the role of housing conditions in child and family well-being, existing studies have generally fallen short of capturing the interplay among multiple housing conditions and instead focused on a single dimension of housing (such as affordability, residential crowding). In addition, research on housing problems have usually been conducted in one demographic, low income families; yet, housing experiences of another vulnerable subpopulation, teenage mothers and children, are missing from most of the studies. The present study addresses these gaps in the literature by investigating the patterns of housing insecurity among families headed by teenage mothers.

Using data from Massachusetts Health Families Evaluation-2 (MHFE-2), I conducted latent class analysis (LCA) to classify teenage mothers ($N = 563$) into homogenous subgroups of housing-related challenges called latent classes. Following the model selection, I examined the predictors of housing insecurity and the associations between latent class membership and utilization of home visiting services.

Findings provided support the existence of four latent classes that best described teenage mothers' housing experiences. Findings also indicated that several background and demographic characteristics differentiated among latent classes of housing-related challenges. I discuss the implications of these findings for housing and home visiting programs and policy.

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CHAPTER 1: INTRODUCTION

Housing, as a primary proximal context, has a critical role in children's development (see Leventhal & Newman, 2010, for a detailed review). Different aspects of housing may be directly related to children's health and development, as when the physical characteristics of housing cause accident, injury or disease; or they may exert an indirect effect via family processes, as when parenting stress, instability of family routines, or poor quality parent-child interactions ensue due to housing problems (Leventhal & Newman, 2010). Families with children are especially vulnerable to housing problems. In 2013, more than 40% of families with children lived in physically inadequate, crowded or unaffordable housing (Federal Interagency Forum on Child and Family Statistics, 2015). Researchers have generally examined individual aspects of a family's housing circumstances; few have sought to understand the interplay of the multiple dimensions of housing in relation to child and family well-being (for exceptions, see Coley, Kull, Leventhal, & Lynch, 2014; Coley, Leventhal, Lynch, & Kull, 2013; Conley, 2001; Crowley, 2003; Murray, 1997). However, addressing the interrelations among housing characteristics is required to better understand families' housing experiences. Only then, will it be possible to develop more targeted housing interventions and policies for families with varying housing needs.

There is no standard definition of housing insecurity¹ (Kushel, Gupta, Gee, & Haas, 2006). According to the Department of Health and Human Services

¹ In this dissertation, the term housing insecurity is used to refer to conditions that involve perceived household crowding, perceived affordability problems, multiple moves and having a temporary living arrangement.

(DHHS), housing insecurity refers to a set of challenging conditions including poor housing quality, overcrowding (i.e. more than one person per room), unaffordable housing (i.e., housing costs which exceed 30% of a household's monthly income), homelessness, and/or disadvantaged neighborhoods characterized by poverty, high crime rates and a shortage of employment opportunities (Johnson & Meckstroth, 1998). Currently, this definition has been expanded to include residential mobility (i.e., having moved more than once in the past year) (Bailey et al., 2015; Cutts et al., 2011; Sandel et al. 2014), and falling behind on rent or mortgage, which acts as a proxy for problems related to housing affordability (Joyce et al., 2012; March et al., 2011). In addition, the term housing insecurity is sometimes used interchangeably with housing instability (Burgard, Seefeldt, & Zelner, 2012; March et al., 2011).

Despite the lack of consensus on definition and measurement, poor housing conditions are receiving growing attention in relation to children's health and well-being (Evans, 2006; (Jelleyman & Spencer, 2008; Leventhal & Newman, 2010); nonetheless, there is still a dearth of studies exploring housing insecurity in the subpopulation that is the focus of this investigation – teenage parents and their children. This lack of research is worrisome in light of the vast literature highlighting the association of teenage childbearing with a wide range of risks to the well-being of both young mothers and their children (Meade, Kershaw, & Ickovics, 2008; Jutte et al., 2010). For example, it is well documented that giving birth as a teenager reduces the likelihood of receiving a high school diploma, and in turn, decrease economic opportunities and future

earnings (Coyne & D'onofrio, 2012; Fletcher & Wolfe, 2009). Socioeconomic disadvantage characterizing young families is likely to translate into housing challenges for this population by forcing them to live in substandard housing, double up with family or friends or move frequently.

Indeed, a handful of studies that address the housing circumstances of teenage mothers have provided support that housing is a core issue for teenage parents. For instance, young parents were reported to be at increased risk of residential instability both during pregnancy and after childbirth (Saadeh et al., 2013). The findings from a qualitative study (Cooke & Owen, 2007) indicate that teenage parents who were seeking accommodation were mostly concerned about crowded conditions in their current residence, multiple moves and having limited access to decent housing. Unpublished data from a content analysis of home visits of a small sample of teenage mothers participating in a statewide home visiting program (Healthy Families Massachusetts; HFM) reveal that housing was one of the major topics addressed during home visits (Coskun, 2010). Although housing is a subject that HFM expects to arise, its preponderance in this earlier analysis was a warning about the substantial level of concern and distress these young mothers were experiencing about housing. A related study (see Tufts Interdisciplinary Evaluation Research [TIER], 2015, for summary) exploring the reasons for early exit from HFM suggests that insecure housing also may serve as a barrier to engagement in programs intended to support teenage parents in their capacity as caregivers. The results show that residential mobility, a well-

established indicator of housing insecurity, was identified as the second most frequently-cited reason for program discontinuation.

This dissertation builds upon a small body of research that underscores the relevance of housing problems to teenage mothers. Based on data collected from participants in Massachusetts Health Families Evaluation-2 (MHFE-2), I investigate the housing experiences of recent teenage mothers. Studying the housing conditions of young mothers during early parenthood is critical, as these young women are still adjusting to their new caregiving role. Problems related to housing may be a major stressor and may interfere with young mothers' capacity for sensitive parenting which is particularly important during the first few years of life (Hart & Risley, 2003; Raby, Roisman, Fraley, & Simpson, 2015). In addition, housing stress – whether it is caused by crowded living conditions, housing cost burden, frequent moves or homelessness – may disrupt involvement in home visiting services and, in turn, compromise attainment of the desired program benefits for teenage mothers and their children.

The indicators of insecure housing that I examine include *perceived overcrowding*, *perceived housing affordability*, *residential mobility*, and *having a temporary living arrangement (TLA)*. Choice of these indicators was guided by the housing literature that points to the salient dimensions of insecure housing (Bailey et al., 2015; Cutts et al., 2011; Johnson & Meckstroth, 1998; March et al., 2011), as well as the availability of usable data from the MHFE-2 dataset. By employing latent class analysis, a person-centered analytic technique that allows examination of how variables combine across individuals, this dissertation

uncovers the extent to which different kinds of housing challenges occur in tandem with one another, and form distinct patterns. Because such patterns may be indicative of different sets of risk factors among teenage mothers, my secondary goal is to identify predictors of housing insecurity patterns. Lastly, I assess the association between housing problems and the use of home visiting services among MHFE-2 participants. Research questions addressing these goals are listed below:

Research Question 1: Can subgroups of teenage mothers, characterized by qualitatively different housing challenges, be identified? If so, what do those subgroups, or latent classes, look like?

Hypothesis 1a. During my review of the housing literature, I was unable to find any empirical studies that used latent variable models to illustrate teenage mothers' housing challenges. Therefore, my LCA analysis is exploratory. However, I anticipate that housing affordability would be a common problem among teenage mothers as they are still too young to be economically self-sufficient. I hypothesize that one group of mothers who have affordability problems would also experience crowding as they would double-up with family and friends to lower housing costs. For a second group of teenage mothers, affordability would coincide with residential mobility as they would move multiple times in hopes of finding affordable housing. A third group of teenage mothers would experience the most severe form of housing insecurity, homelessness, and report having had a temporary living arrangement while

pursuing housing. A fourth group of teenage mothers would be securely housed and have no substantial housing challenges.

Research Question 2: Do selected attributes (i.e., race/ethnicity, age at child birth, living with an adult relative/guardian, employment status, financial assistance, childhood history of maltreatment, depression, substance use, housing dissatisfaction and neighborhood income) predict membership in housing insecurity latent classes?

Hypothesis 2a. The presence of risk factors would predict membership in first three latent classes characterized by various housing challenges and presence of protective factors would be associated with membership in the “secure housing” latent class. For instance, Hispanic origin may predict membership in perceived unaffordability and perceived overcrowding latent class; receipt of public assistance and low neighborhood income may predict membership in the perceived unaffordability and mobility latent class; childhood history of maltreatment and substance abuse may predict membership in the temporary living arrangement (TLA) latent class; and older age at childbirth, living with an adult relative/guardian, being employed, low depression scores and housing satisfaction may predict membership in “secure housing” latent class.

Research Question 3: Do teenage mothers who can be characterized by different housing insecurity latent classes use home visiting services differently?

Hypothesis 3a. Based on MHFE-2 data indicating that “high users” tend to use multiple types of services (i.e., home visits, parenting groups, substantive

secondary activities²), with greater frequency (TIER, 2015), it is hypothesized that teenage mothers in the “secure housing” latent class will have the longest enrollment in the program and the greatest number of home visits and “substantive” secondary activities. On the other hand, shortest enrollment and lowest service utilization will be reported for teenage mothers in the “perceived affordability and residential mobility” latent class, as residential mobility is a robust predictor of program utilization in MHFE-2 sample (TIER, 2015).

In shedding light on the housing circumstances of young families, the current study may help initiate a policy dialogue on particular housing needs of these families and develop housing initiatives and interventions aimed at supporting them. This study also may contribute to the discussion on program engagement by offering an insight into the role of housing challenges in utilization of home visiting services. Home visiting programs may capitalize on current study’s findings to tailor services to specific circumstances of unstably housed families and in turn, facilitate their use of support services for extended periods.

² *Secondary activities* refer to any non-visit activity conducted by the home visitor or HFM staff, with, or on behalf of the participant, such as phone calls, text messages, emails, rides and delivery of goods.

CHAPTER 2: LITERATURE REVIEW

In this literature review, I first provide a brief overview of the developmental sequelae of teenage childbearing. Next, I examine several indicators of housing insecurity with an emphasis on their relation to individual and family well-being. Then I describe several policies and programs that are closely related to housing circumstances of teenage parents. In the final section, I focus on home visitation as a service delivery method to address the needs of parents and their young children; a review of the evidence on home visiting effectiveness, and an examination of engagement and retention in home visiting programs follow.

Developmental Trajectories of Teenage Mothers

Although there is wide variation in young mothers' developmental trajectories (Mistry et. al., 2016), adolescent childbearing is associated with various background characteristics and risk factors. For example, teen birth rates among Hispanic and black teens are twice as high as those of white teens (Hamilton, Martin, Osterman, & Curtin 2015). Many teen mothers tend to come from disadvantaged backgrounds characterized by low family socioeconomic status, single parent households, maternal teenage childbearing and poor neighborhoods (Kirby & Lepore, 2007; Meade et al., 2008; Mersky & Reynolds, 2007; South & Crowder, 2010; Woodward, Fergusson, & Horwood, 2001). Teenage childbearing is also linked to psychosocial stressors including history of childhood maltreatment, substance use, and depression (Chapman & Wu, 2013;

Putnam-Hornstein, Cederbaum, King, Cleveland, & Needell, 2013; Reid & Meadows-Oliver, 2007).

Early parenthood often interferes with young women's educational and economic success. Teenage mothers have a low likelihood of finishing high school and going to college compared to older parents (Casares, Lahiff, Eskenazi, & Halpern-Felsher, 2010; Perper, Peterson, & Manlove, 2010). As a result, their employment opportunities are limited and they are likely to have low wage jobs (Fletcher & Wolfe, 2009; Hoffman & Maynard, 2008; Lee, 2010). Repeat births, a fairly common phenomenon among teenage mothers, are also damaging to young females' future prospects, in particular, when they occur before the age of 20 and are closely spaced (Klerman, 2004). Taken together, these factors increase teen mothers' risk of poverty (Ng & Kaye, 2012) and reliance on public assistance (Casares et al., 2010). Because a sizeable portion of teen births occurs out of wedlock (Martin et al., 2013), teenage mothers also tend to bear parenting responsibilities without the regular support of a spouse or partner (Woodward et al., 2001).

Despite the general tendency to view teenage mothers as a monolithic group, with all the stereotypes involved—such as the belief that they are “uneducated”, “poverty stricken”, and “bad mothers”—current evidence suggests that they are more diverse than they are depicted (Mistry et al., 2016). Many young mothers attain positive outcomes for themselves and for their children in the face of adversity (Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2011; Oxford et al., 2005). A number of individual and community level factors are

linked to teenage mothers' resilience, ranging from cognitive readiness to social and formal support (Kennedy, Agbényiga, Kasiborski, & Gladden, 2010; Whitman, Borkowski, Keogh, & Weed, 2001; Whitson, Martinez, Ayala, & Kaufman, 2011). Housing has not been examined as a potential protective factor in teenage mothers' lives. Yet, decent, stable housing in high opportunity areas where teen parents can raise their child in a stress free environment and have a better shot at furthering their education or taking up employment may be associated with positive adjustment in this population.

Housing Insecurity

The U.S. Department of Health and Human Services (DHHS, 1998) identifies four conditions that constitute housing insecurity, as follows: i) poor housing quality, ii) overcrowding, iii) affordability, iv) unstable neighborhoods, v) homelessness (Johnson & Meckstroth, 1998). In the next section, I review several of the abovementioned dimensions of housing insecurity, with an emphasis on their impact on children and adults. Housing dimensions included in this definition are incorporated into the literature review only if relevant data are present in the MHFE-2 dataset. Although residential mobility was not part of the DHHS's definition, I also reviewed this dimension as literature indicates that multiple moves in a year is an important correlate of overall well-being (Adam & Chase-Lansdale, 2002; Dong et al. 2005; Pribesh & Downey, 1999) and many young mothers report experiencing residential mobility during pregnancy and post pregnancy (TIER, 2015).

Residential Crowding

Children under the age of six spend as much as 78 – 83 % of their time indoors (U.S. Environmental Protection Agency, 2011), making their home environment particularly influential in shaping their socialization, skills and knowledge acquisition, and identity development (Solari & Mare, 2012). Residential crowding is a central element in this equation. The most common measure of residential crowding is persons-per-room (PPR) in a household (Blake, Kellerson, & Simic, 2007). A dwelling unit is usually considered overcrowded when PPR exceeds one (U.S. Department of Housing and Urban Development, 2007) – so four people living in a three-room dwelling would constitute overcrowding. Determination of crowding can also be based on individuals' perceptions. Research suggests that perceived crowding and PPR are closely associated (Baldassare, 1979; Loo & Ong, 1984; Wiesenfeld, 1987).

Three theoretical perspectives on how residential crowding leads to adverse outcomes, salient here, include the *social overload*, *perceived control*, and *adaptive-cost* models. According to the *social overload* perspective (Desor, 1972; Esser, 1972; McCarthy & Saegert, 1979), forced interactions with a large number of people generate an excess of social stimuli – overtaking an individual's cognitive processing capacity. Individuals adapt through withdrawing from others and tuning out social information (Cohen, 1978; Saegert, Mackintosh, & West, 1975). The *diminished personal control* (Altman, 1975; Baron & Rodin, 1978; Sherrod, 1974) perspective asserts that chronic crowding can lower one's sense of impact on her surroundings, and that, in turn reduces her sense of self

efficacy, evincing learned helplessness. Finally, the *adaptive-cost* model (Glass & Singer, 1972) posits that managing sustained environmental stressors, including crowding, depletes an individual's capacity to cope with a broad range of subsequent demands as they arise. Cohen (1978) highlights these consequences for social behavior, including diminished ability to pick up on social cues, interpret intentions and actions, and show sensitivity to others' needs.

Crowding is associated with unfavorable child outcomes on measures of physical and mental health, cognitive ability and academic achievement. Regarding physical health, it compromises a child's capacity to fight infections (Krieger & Higgins, 2002; O'Rourke, Goodman, Grazioplene, Redlinger, & Day, 2003), and is linked to child food insecurity, which increases the likelihood of stunted growth (Cutts et al., 2011; Joyce et al., 2012). Young children living in crowded homes also tend to show more psychological symptoms in comparison to those in uncrowded homes (Evans, Saegert, & Harris, 2001), including withdrawal from social interactions (Liddell & Kruger, 1989) and increased behavior problems (Evans, Lercher, & Kofler, 2002; Evans, Lepore, Shejwal, & Palsane, 1998; Maxwell, 1996). In addition, crowding is implicated in cognitive delays among young children (Evans et al., 2010). In older children, it is linked to lower academic achievement (Evans et al., 1998) and a higher likelihood of grade retention (Goux & Maurin, 2005). Crowding in the early years also predicts lowered educational attainment at age 25 (Conley, 2001).

Comparably, adults demonstrate the potential negative effects of crowding as well. In addition to evidencing a strong relation to poorer physical health (see

Office of the Deputy Prime Minister, 2004 for a review; Gove, Hughes, & Galle, 1979), household crowding is a predictor of psychological distress (Evans, Palsane, Lepore, & Martin, 1989; Lepore, Evans, & Palsane, 1991; Wells & Harris, 2007). Indeed, Gove et al. (1979) found both objective and perceived crowding positively associated with experience of psychiatric symptoms, sadness and irritability, feelings of alienation, and low self-esteem. Crowding also is linked the quality of relationships within households, through social withdrawal (Lepore, Evans, & Schneider, 1991), low social support (Evans et al., 1989), and discord among members evident (Gove et al., 1979).

As regards childrearing, crowding is predictive of negative caretaker behaviors; these parents appear less responsive (Evans et al., 2010), and use a less diverse and sophisticated vocabulary and engage in less conversation with their children (Wachs & Camli, 1991), compared to parents in uncrowded homes (Evans, Maxwell, & Hart, 1999). They report high degree of irritability with their children (Bartlett, 1998), elevated parent-child conflict (Evans et al., 1998), and increased use of physical punishment (Gove et al. 1979). Finally, residential crowding is associated with reduced parental support (Evans et al., 1998), and monitoring of children's activities outside of home (Gove et al., 1979).

Housing Affordability

The overall number of households paying more than 30% of their income to housing dropped for the first time over the past decade, during the most recent two year period, 2011 to 2013, down from 43.2 million to 39.7 million (HUD, 2015). However, when those households are divided into renters and home

owners, much of the reduction in the rate of cost burdened households emerge on the homeowner side, whereas the prevalence of cost burdens was at a near record high among renters. In 2013, more than 19 million renter households – 47.3 % – were severely or moderately cost burdened³ (HUD, 2015). Despite the dire need for affordable housing, highlighted by these statistics, there is a shortage of affordable units for occupancy, with only 65 affordable units available per 100 low-income renters⁴, and only 39 units for every 100 extremely low-income renters⁵ (HUD, 2015). Indeed, according to a current report by the National Low Income Housing Coalition (NLIHC, 2015), an individual working full time at the federal minimum wage cannot afford a one- or two-bedroom apartment priced at the Fair Market Rent⁶ in any U.S. state.

Families with children are particularly susceptible to affordability problems. According to the latest data available, 35% of households with children were housing cost burdened in 2013 (The Federal Interagency Forum on Child and Family Statistics, 2015). High housing costs compel families to live in subpar homes and unsafe, resource poor neighborhoods (Berube, 2008). High housing costs also force some families to choose between housing and other basic needs, including food, transportation, healthcare and retirement savings (Joint Center for Housing Studies, 2015). Adults in families reporting difficulties in

³ Severe cost burden refers to paying 50% or more of household income on housing costs and moderate cost burden refers to paying 30- 50% of household income on housing.

⁴ Households earning at or below 80% of area median income (AMI) are defined as low-income.

⁵ Those households earning at or below 30 % of AMI.

⁶ HUD defines FMR as the amount needed to pay the gross rent (shelter rent plus utilities) for a typical, standard housing unit in a local housing market.

covering their housing costs within the past year were almost three times more likely to forego medical treatment (AOR=2.94) and prescribed medication (AOR = 2.68), compared to their counterparts who were not burdened by housing costs (Pollack, Griffin, & Lynch, 2010). Likewise, adults living in unaffordable housing were more likely to postpone needed medical care and medication for their children (Ma, Gee, & Kushel, 2008).

High housing costs not only restrict expenditures on non-housing necessities, but also may affect investments in children. Newman and Holupka (2014), using data from the 2004-2009 Consumer Expenditure Surveys, found an inverted U-shaped relationship between housing cost burden and spending on items related to child enrichment. Results indicated that spending on child care and a range of educational goods and services increased until housing costs take up to 30 to 35% of family's income. A decline was noted in child enrichment expenditure as households paid more than 35% of their income to housing. In addition to forcing families to make such trade-offs, high housing costs make it difficult for families to keep up with their rent or mortgage payments and thus could be a precursor to residential relocations (Jelleyman & Spencer, 2008), doubled up living arrangements (Curtis, 2007; Curtis, 2011) and homelessness (Curtis, Corman, Noonan, & Reichman, 2013).

Despite its high incidence and potential negative consequences, studies examining housing affordability in relation to child and family outcomes are limited (Bailey et al., 2015; Newman & Holupka, 2015). Available studies have used different measures of affordability and yielded mixed results. Some of those

studies have demonstrated detrimental effects of high housing costs – at least on some measures of family well-being, such as child health and behavioral adjustment (Harkness & Newman, 2005), and maternal health and depression (March et al., 2011). In contrast, other studies have found positive effects of unaffordable housing on target outcomes. For instance, Harkness and colleagues (2009), using the local housing price as an indicator of affordability, found that living in higher-priced housing markets was associated with higher reading achievement and decreased maternal depression among low-income families. In a similar fashion, increases in housing costs were linked to better behavioral and emotional functioning among poor and near poor children (Coley et al., 2013).

Harkness and Newman (2005) suggest that the positive association between high housing costs and individual well-being could be explained, at least partially, by unmeasured characteristics of individuals or locales that could offset the adverse effects of unaffordable housing. For instance, various characteristics of families could predispose them to self-select into areas with higher housing prices and some of those unmeasured characteristics could also be associated with favorable outcomes for families. Alternatively, families could benefit from unmeasured characteristics of areas with high housing prices, such as neighborhood safety, community resources, and higher quality schools, and those benefits could mitigate the effects of housing cost burden. In the absence of control for these variables, the adverse effects of unaffordable housing could be underestimated.

Residential Mobility

Residential mobility is generally considered a stressful experience, particularly when moves are precipitated by adverse family circumstances, such as family disruption or economic stress (Clark, 2010; Cohen & Wardrip, 2011; Coulton, Theodos, & Turner, 2009). Although the definition of residential mobility is straightforward – moving from one place of residence to another – there are numerous facets to this phenomenon. In their extensive review of the literature, Jelleyman and Spencer (2008) identified several aspects of residential mobility, including its magnitude (i.e., number of moves), the distance moved when residences change, the reason(s) for relocation, and the extent and ways that the new residential context or neighborhood differs from the previous one.

To date, most of the research relating to the residential stability of low-income families with young children has focused primarily on one of two elements – frequency or the quality of moves – that is, whether the move signifies an improvement in the life circumstances of the individuals involved. Given the parameters of this proposed study, the focus below is on residential mobility as represented by the number of moves.

Residential mobility, indicated by multiple moves within a limited period of time, undermines the attainment of child and adult outcomes, even after controlling for family disadvantages that increase the likelihood of moving (Adam & Chase-Lansdale, 2002; Dong et al. 2005; Pribesh & Downey, 1999). The potential mechanisms linking residential moves to individuals' well-being include the disruption of activities and routines, the loss of social connections, and

increased family stress (Adam, 2004; Kerbow, 1996; Pettit & McLanahan, 2003; Pribesh & Downey, 1999; Suglia, Duarte & Sandel, 2011). There is also emerging research that focuses on self-regulation as a mediator of mobility effects on children's behavioral adjustment and learning (McCoy & Raver, 2014; Roy, McCoy & Raver, 2014).

Studies describing the association between residential mobility and physical health are rather limited. However, available studies highlighted the relationship between residential moves and unfavorable child health outcomes. For instance, in a cross-sectional study conducted with a large sample of young, low-income children, multiple moves in the previous year predicted elevated risk of parent rated poor health status, food insecurity, and developmental delays (Cutts et al., 2011; Joyce et al. 2012). Using data from National Survey of Children's Health, Busacker and Kasehagen (2012) found that a greater number of lifetime moves were associated with poor general health and oral health, lack of stable medical home and inconsistent insurance coverage.

For adults, a retrospective study of residential mobility demonstrated that fewer residential moves in childhood were linked to better overall health in midlife (Bures, 2003). In another retrospective study, a dose-response relationship was found between early residential moves and later health outcomes (Dong et al. 2005). However, when additional controls were put in place for childhood adversity as indicated by abuse, neglect and household dysfunction, only risk of a particular poor health behavior, alcoholism, remained significant.

Researchers also find detriments to physical health among movers in longitudinal studies. For instance, compared to low mobility, high residential mobility in childhood, indicated by three or more moves before the age of six years, predicted higher risk of mortality in adult years (Juon, Ensminger, & Feehan 2003). In a study with a large European sample, the greater number of places lived between birth and age 18 increased the risk of poor health behaviors including smoking and illegal drug use (Brown et al., 2012).

Research consistently demonstrates a negative association between residential mobility and mental health. Simpson and Fowler (1994) found that high family mobility, indicated by three or more moves, doubled the risk of parent reported emotional problems and receiving psychological help. Likewise, increased mobility in childhood significantly heightened the risk of depression in adolescence (Gilman, Kawachi, Fitzmaurice & Buka, 2003). In a longitudinal study examining the psychological correlates of frequent moves, childhood residential mobility was associated with lower levels of psychological well-being and life satisfaction in adulthood (Oishi & Shimmack, 2010). Negative mental health outcomes have been reported also for adult movers. High-risk women who moved multiple times over the six months were three times more likely to be depressed than were their stably housed counterparts (Davey-Rothwell, German, & Latkin, 2008). Recent multiple moves also significantly contributed to the risk of depression and anxiety disorders among mothers of young children (Suglia et al., 2011).

A substantial body of research examines the association of residential mobility with cognitive and academic outcomes. The data from Fragile Families and Child Wellbeing study demonstrated that a high level of mobility before school age was associated with a higher likelihood of attention difficulties, though only among children from poor families (Ziol-Guest & McKenna, 2014). The moderation of the association between residential mobility and child functioning by family income suggests that low-income families do not usually experience post-move improvements in their living conditions, such as residing in a better neighborhood, which could potentially mitigate the disruptive effects of moves (Holupka & Newman, 2011). Additionally, a greater number of past moves were associated with poor academic performance (Adam, & Chase-Lansdale, 2002), and a higher likelihood of grade retention and school dropout (Simpson & Fowler, 1994; South, Haynie, & Bose, 2007; Wood, Halfon, Scarlata, Newacheck & Nessim, 1993).

There is also a well-established link between residential mobility and behavioral adjustment. Studies have shown that residential mobility increased the risk of poor self-regulation (McCoy & Raver, 2014), behavior problems (Adam, & Chase-Lansdale, 2002; Wood et al. 1993; Ziol-Guest & McKenna, 2014), early-onset drug abuse (DeWit, 1998), precocious sexual activity (Stack, 1994; South, Haynie, & Bose, 2005), teenage pregnancy (Crowder & Teachman, 2004; Dong et al., 2005) and suicide attempts (Haynie, South, & Bose, 2006).

Homelessness

Approximately 2.5 million children, or one in 30, experienced homelessness in 2013, marking an all-time high in U.S. history (The National Center on Family Homelessness [NCFH], 2014). Homeless children and families move frequently (NCFH, 2009), share living quarters with others (Bassuk, 2010), or live in cars, public spaces or emergency shelters including motels (NCFH, 2009); these families risk dissolution, as children are sometimes placed in foster care or sent to live with relatives (Barrow & Lawinski, 2009).

Homeless families share several characteristics: A typical homeless family consists of a single mother under the age of 30 and two children (NCFH, 2009). In general, adults in homeless families have limited education and job prospects (NCFH, 2009). Often, homeless mothers have a history of victimization in their childhood or later, in their intimate relationships (Bassuk et al., 1996; Browne & Bassuk, 1997; Guarino & Bassuk, 2010). Adults in homeless families are usually in poor health and have chronic health issues including asthma, anemia, ulcers (Rog & Buckner, 2007). Due to a multitude of stressors in their lives, adults in homeless families tend to struggle with mental health issues and substance abuse (Bassuk et al., 1996; Weinreb, Buckner, Williams & Nicholson, 2006). Unpredictability and the distress resulting from lack of stable housing could be associated with adults' parenting skills. For instance, chaotic conditions of homelessness compromise parents' ability to adequately respond to their children's needs (David, Gelberg, & Suchman, 2012; Guarino & Bassuk, 2010).

Similar to their parents, homeless children are susceptible to health problems. They are at risk of suffering from asthma, respiratory problems and ear infections (Tobin & Murphy, 2013). Insufficient or poorly balanced diet is of concern among homeless children, relating to increased rates of obesity in this population (Grant et al., 2007). Homelessness is also detrimental to children's education. Unstable housing and frequent relocations are likely to result in school transfers that could disrupt learning routines and hold children's learning back (Voight, Shin, & Nation, 2012). Additionally, homeless children have an increased likelihood of experiencing developmental delays and learning disabilities that could go unnoticed due to frequent school changes (Emerson & Lovitt, 2003; NCFH, 2009). Given all these adversities, homeless children face the risk of poor academic performance, grade retention and dropping out of school (NCFH, 2009).

Housing Conditions of Young Parents

Young adults may be vulnerable to undesirable housing conditions as they might not have yet accumulated enough financial resources to acquire and maintain decent housing (Wright, Caspi, Moffitt & Silva, 1998). And the subgroup of youth of particular interest to this proposed study — pregnant and parenting teens — could well be disproportionately affected by housing problems for several reasons. For one, some pregnant teenagers meet parental disapproval or cannot be financially supported by parents and end up without housing (Andrews, & Moore, 2011). Even if they are not forced out of their homes, staying with their parents could put some teenage parents and their babies in an

unsafe situation. In a longitudinal evaluation of a state-wide home visiting program targeting teenage mothers, researchers noted that more than half of the participants enrolled in the program had a childhood history of maltreatment (TIER, 2015). In another study exploring exposure to different forms of violence among homelessness youth, Kennedy (2007) found that a sizeable portion of young parents either witnessed domestic violence or were physically abused by their caregivers. Teen parents also report leaving their homes because of strained relationships with parents, overcrowding, and witnessing drug use around them and their babies (Collins, Stevens & Lane, 2000; Cooke & Owen, 2007). Few young parents possess the financial security to afford their own housing (Afifi, 2007; Collins et al., 2000; Mollborn, 2007). As a result, teenage parents are likely to have limited access to decent housing and, live under crowded conditions and experience multiple moves (Cooke & Owen, 2007).

Little is known about the actual housing circumstances of young parents. Nonetheless, available data indicate that pregnant and parenting youth are challenged by housing issues in particular by residential mobility (Saadeh et al., 2013). For instance, approximately one-fourth of adolescent mothers (23%) reported moving in and out of the family house multiple times during the first two year of parenting (Oberlander, Shebl, Magder, & Black, 2009). A current study examining the interface of living arrangements and housing conditions of adolescent mothers established that the most unstably housed group was also the one characterized as having vulnerabilities in multiple domains (Jacobs et al., 2015). A majority of these young mothers (71%) had a history of maltreatment as

children. Most reported having financial difficulties and as a group, they were highly reliant on public assistance. Moreover, they were more likely to have used harsh and negative parenting practices, as indicated by substantiated reports of child abuse and neglect, compared to more stably housed teen parents. As this narrow body of research suggests, unfavorable housing conditions threaten the well-being of young parents and their children who are already at risk of attaining poor outcomes in multiple domains.

In sum, many teen parents face significant adversity in their lives. They tend to come from families of low socio-economic status, headed by single mothers and those with a history of teenage childbearing. In addition to heightened vulnerability among adolescent mothers prior to parenthood, having a baby as a teenager puts the mother at risk of undesirable outcomes across a range of domains including educational attainment, economic well-being and mental health.

Housing insecurity as evidenced by residential crowding, unaffordable housing, residential mobility and homelessness has been shown to be disruptive to physical and mental health. Although our knowledge of the housing circumstances of young families is limited, it stands to reason that many face housing challenges, not least because of their financial limitations. Indeed, available studies suggest that housing insecurity, especially in the form of residential mobility, is not uncommon in this population.

The Policy Context

In the next section, I focus on two broad areas of public policy that speak to the housing challenges of young families; *cash assistance* (Temporary Assistance for Needy Families [TANF]), and *direct housing supports* (subsidized housing, and alternative living arrangements).

Cash Assistance

Temporary Assistance for Needy Families (TANF) was created through Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193). This federal law was designed to provide cash assistance to needy families with children while reducing welfare dependence through promoting workforce participation and family stability. The federal government provides a block grant to states to provide income assistance and implement services that would provide a safety net and connect families to work. Under TANF, states have latitude to determine income limits for eligibility, the amount paid to TANF families, time limits for benefits, possible work related activities recipients are required to participate and the sanctions when recipients fail to comply with work requirements (Center on Budget and Policy Priorities [CBPP], 2015). While states have flexibility in how they implement the TANF program, several federal restrictions are in place for the use of TANF funds. For instance, there is a five-year lifetime limit on welfare benefits. States cannot use funds to provide financial assistance to immigrant families until at least five years after their arrival. In addition, states must require families to engage in work activities within 24 months on their coming on TANF rolls and must sanction families who

refuse to comply with work requirements by reducing or eliminating welfare benefits (CBPP, 2015).

In Fiscal Year 2014, of the 705,147 adolescents living in TANF households, about 40,242 (6 %) were parents (U.S. Department of Health and Human Services, 2015). TANF has special provisions for teen parents that involve their living arrangement and the schooling of minor parents. In order to become eligible for cash benefits, single teen parents under the age of 18 are required to live at home with their parents, an adult relative, a legal guardian or in an adult-supervised supportive living arrangement. However, a minor parent can claim an exemption from the requirement to live at home if: (a) the minor parent is physically or sexually abused, (b) any of the household members abuse alcohol or drugs, (c) the parent, adult relative or legal guardian does not spend the minor cash assistance to support the minor parent (d) if the home is unfit for habitation due to code violations (“Teen Parents,” n.d.). Additionally, teen parents need to adhere to school attendance rules which require pregnant and parenting teens under age 20 to be in school full-time by the time their infant is 12 weeks old or have completed high school or its equivalent. In order to maintain TANF benefits, teen parents need to attend school or the GED program at least 75% of the time. Teen parents cannot be sanctioned if they miss school due to lack of child care or concerns about domestic or intimate partner violence (“Teen Parents,” n.d.).

Although the living arrangement requirements aim to ensure adult supervision of minor parents, an unintended consequence may be denying access

of eligible teens (Levin-Epstein & Schwartz, 2005). Eligible teens who do not live at home and are not knowledgeable about the exemptions available to them may not apply for TANF benefits. Alternatively, minor parents –usually, the ones in the direst situation such as homeless teens – may be denied cash assistance when welfare caseworkers fail to investigate if minor parents qualify for exemptions (Hummel & Levin-Epstein, 2005). In addition, even when exception rules are fully understood and applied, states often lack resources to provide alternative living options for teen parents such as “second chance homes” (Eshbaugh, 2008).

Direct Housing Supports

Rental assistance programs. Although the right to decent, affordable housing has been advocated for generations (Bratt, Stone, & Hartman, 2006), it is still not an entitlement in the U.S. Available funds serve only a small fraction of the needy families. Currently, about a quarter of eligible renter households—4.8 million—receive some form of rental assistance (Congressional Budget Office, 2015). In contrast, roughly 16 million eligible households remain unassisted. Of the eligible but unassisted households most — six out of seven — are housing cost-burdened, and more than half are severely cost-burdened.

The disparity in the demand and supply of housing assistance is concerning when research demonstrating the benefits of rental assistance is considered. There are three major rental assistance programs— the Housing Choice Voucher Program, public housing, and privately owned subsidized housing. The Housing Voucher Program is an example of tenant-based

assistance. Public housing and privately owned subsidized housing fall into the category of project-based assistance. Tenant-based assistance differs from project-based assistance in that the former can be used to rent any properties that meet the quality standards whereas the latter attaches subsidies to particular units that have a contract with the federal Department of Housing and Urban Development.

Results from a randomized trial of the effects of housing vouchers on low-income families showed that housing vouchers resulted in a 25% decrease in the rates of poverty among recipients. Reduced expenditure on housing enabled families to spend more of their income on food. Interviews with voucher holders indicated that housing security warranted by rental assistance was a source of relief from anxiety and stress for families. Additionally, some recipients reported that rent assistance helped them work reduced hours and spend more time with their children (Wood, Turnham, & Mills, 2008).

An Australian study examining the changes in the lives of public housing tenants yielded similar results (Phibbs & Young, 2005). Placement into public housing improved the self-reported physical and mental health of the tenants. Tenants attributed the improvements in their health to a more healthy diet; increased self-esteem resulting from independent living and reduced stress due to extra income and housing security afforded by housing assistance (Phibbs & Young, 2005). Several other studies provided additional evidence of positive health outcomes associated with rental assistance programs. For instance receiving rental assistance was associated with better physical growth among low-income children (Meyers et al., 2005; Meyers et al., 1995). Hospitalization rates

for a variety of medical conditions including infectious disease, cardiovascular and respiratory disease and mental health conditions were markedly lower among public housing tenants compared to applicants on the waiting list (Baker, Zhang, & Howden-Chapman, 2010).

Rental assistance is also shown to reduce the likelihood of homelessness, doubling-up, overcrowding and residential relocations (Mills et al., 2006; Samuels, Kline, Shinn, & Buckner, 2010; Sandel et al. 2014; Wood et al. 2008). Rental assistance frees up funds for other basic necessities, and thus might be key to promoting food security and health care access. Evidence indicates that rental assistance decreases the risk of household food insecurity (Kirkpatrick & Tarasuk, 2011) and undernutrition in young children (Meyers et al., 2005). In addition, rent subsidies enable low-income households to allocate funds on much needed medical care through decreasing housing costs (Lee, Beecroft, Khadduri & Patterson, 2003).

The need for rental assistance may be more pronounced among young families, due to their relative socioeconomic disadvantage. Having a baby at an age when their peers are still at school and develop the essential skills needed in the job market may make it difficult for teenage mothers to achieve self-sufficiency, including paying for housing. The situation is compounded by the fact that a significant portion of teenage mothers are single, and hence tend to be the sole provider for their children and themselves (Hamilton, Martin, & Ventura, 2011). Under these circumstances, families headed by teenage mothers are likely to face a multitude of housing challenges including involuntary moves, doubling

up, issues with affordability and even homelessness. The buffering role of rental assistance against housing insecurity has been established among other populations and there is sufficient reason for expecting similar positive results among families led by teenage parents.

Alternative living arrangements for teenage mothers. Another form of direct housing support available to pregnant and parenting teenagers is the residential programs catering to this population. These so-called alternative living arrangements were developed in response to the TANF living requirement for teen parents that mandate adult supervision to receive welfare benefits and are implemented by local governments. One such alternative living arrangement is the Teen Living Program.

Gilfeather (2005) describes teen living programs as “group homes, clusters of apartments, or networks of homes that integrate housing and services for teenage mothers and their children who cannot live at home because of abuse, neglect, or other extenuating circumstances” (p. 46). Teen living programs in Massachusetts are called Second Chance Homes (SCH). Minor parents may be referred to SCHs through several institutions including welfare agencies, homeless shelters, foster care programs, hospitals and schools. It is also possible that young parents check themselves into SCHs (Andrews & Moore, 2011). Eligibility criteria and program features vary substantially from site to site. Some programs provide services exclusively to teenage mothers and their children whereas others are open to welfare recipients or homeless families (Andrews & Moore, 2011). While some programs impose no restrictions on length of stay,

others offer short term accommodation. There is also a wide variation in available services. Almost all programs offer parenting classes and referrals. To a lesser extent programs may provide transportation, childcare, education and job training (Hulsey, 2004). These comprehensive services aim to improving parenting skills, child outcomes and maternal life course.

The U.S. Department of Health and Human Services (DHHS) and the Department of Housing and Urban Development (HUD) are the major federal grantor agencies for SCHs. Within each agency, there are various funding streams for SCHs. Despite various funding sources, supply falls short of meeting the demand and families may have to wait for extended periods before they get into SCHs (Andrews & Moore, 2011). Even in Massachusetts, one of the states with the greatest number of Second Chance Homes, the capacity to address the needs of young families is limited (Cooper, 2006).

In sum, policy attention to the distinctive circumstances of pregnant and parenting teenagers is scant, with inadequate systemic thinking about how housing fits into the broader landscape of supports these young families need. Our previous work with teenage parents participating in Healthy Families Massachusetts home visiting program suggests that housing problems are widespread in this population (Coskun, 2010). Stable housing seems critical, in part, because it would allow other kinds of services to be delivered consistently and reliably. A promising service in this regard is newborn home visitation, a service approach poised to offer critical supports for parenting to this young parent population (TIER, 2015). In the following section, I briefly discuss this

service modality, summarize current efforts to evaluate these programs, and introduce the home visiting program that is the basis for this study – Healthy Families Massachusetts (HFM). The section concludes with a discussion of program engagement, one of the core elements of programming through which home visiting implementation is investigated, and the main outcome variable in this study.

Home Visiting as a Service Modality

Home visiting has a long standing history in the U.S., dating back to the last quarter of the 19th century (Gomby, Culross & Behrman, 1999). However, it has gained increasing popularity over the past several decades. Neuroscience research highlighting the importance of early brain development (Shonkoff & Phillips, 2000; Shonkoff, Boyce & McEwen, 2009) and the feasibility of home visiting programs to promote positive child outcomes within this period partially explain the growing popularity of home visiting programs. Another reason is the endorsement of home visiting by trustworthy professional organizations as an effective strategy to improve family well-being and prevent child maltreatment (American Academy of Pediatrics, 1998; Bilukha et al., 2005; Butchart, Harvey, Mian, & Furniss; 2006; Krugman, 1993).

This increasing popularity as a service modality was reflected in the inclusion of home visiting as a separate program (the Maternal, Infant, and Early Childhood Home Visiting; MIECHV) within the Affordable Care Act (Public Law 111-148) by the U.S. Congress in 2010. The MIECHV has provided \$1.5 billion over five years to states, territories and non-profit organizations for the

development and implementation of evidence-based home visiting programs (Supplee, Harwood, Margie, & Meyer, 2013). In April 2015, Congress extended MIECHV through FY 2017 at its current annual level of \$400 million (“Maternal, Infant, and Early Childhood,”n.d.)

While home visiting programs vary considerably in their goals, the content of their services, staff characteristics (i.e. nurses vs. paraprofessionals) and target population, in general, these voluntary programs provide parenting education; screen children and their caregivers for specific concerns including developmental delays, depression and substance abuse; and connect families to resources and services (Boller, Strong, & Daro, 2010; U.S. Health Resources and Services Administration [HRSA], n.d.). Evidence is accruing to indicate that carefully designed and well-implemented home visitation services lead to improvements in parenting behaviors and attitudes, children’s cognitive abilities and school readiness, and maternal education and economic self-sufficiency (Avellar et al., 2016; Howard and Brooks-Gunn, 2009; Sweet & Applebaum, 2004). The evaluation of a few multi-site home visiting programs targeting teenage mothers has indicated positive impacts of home visiting for young families (Barlow et al., 2013; Jacobs et al., 2016; Mistry et al., 2016).

One such home visiting program specifically targeting first time young mothers is Healthy Families Massachusetts (HFM). Launched in 1997, HFM has since served more than 33,800 young families. At the core of the program are regularly scheduled home visits delivered by a paraprofessional home visitor, who offers parenting information and support to families. In addition, home visitors

help families access resources and services as needed. HFM may begin prenatally or closely after birth and may extend to the third birthday of children. The main program goals are to prevent child maltreatment and enhance parenting competence; foster child health and development; prevent repeat pregnancies; promote maternal education and employment, as well as maternal health and well-being.

A team of researchers from the Tufts University⁷, contracted by the Children's Trust, has been evaluating HFM for the past two decades to gain insight into program operations and effects. The first phase of the evaluation (MHFE-1) employed a non-experimental design and was conducted from 1997 through 2005. Using a mixed-methods approach, data were collected from a sample of 361 participants. MHFE-1 provided suggestive evidence for the effectiveness of the program at enhancing parenting competence, maternal life course and child well-being. On the contrary, no program effects were found on maternal emotional well-being or repeat births. Of note regarding program operations is that, in general, participants had a positive experience with the program. Home visitor-participant relationship appeared central to this experience. At large, participants perceived their home visitor as caring and friendly and felt that the program was family-centered. Nonetheless, participants,

⁷ The research team has been headed by Professors M. Ann Easterbrooks, Eliot-Pearson Department of Child Study and Human Development; Jessica Goldberg, Eliot-Pearson Department of Child Study and Human Development; Francine Jacobs, Departments of Child Study and Human Development and Urban and Environmental Policy and Planning; and Jayanthi Mistry, Eliot-Pearson Department of Child Study and Human Development.

overall, completed fewer visits than planned (Jacobs, Easterbrooks, Brady, & Mistry, 2005).

The second phase evaluation of HFM (MHFE-2) implemented a randomized controlled trial design, and followed a sample of 704 participants (433 in the home visiting services [HVS] and 271 in the referral and information only [RIO] control group) from 2008 to 2012. Data collection was conducted in three waves, through semi-structured interviews, standardized questionnaires and observations. Additionally, state administrative data were obtained from several sources (e.g., the Department of Children and Families, the Department of Transitional Assistance, the Department of Public Health). Impact evaluation results of MHFE-2 indicated that HFM had a positive influence on parenting stress, considered a precipitant of child maltreatment (Jacobs et al., 2016). Program participation also led to increased college attendance and a reduced likelihood of problematic and risky parental behaviors including substance use, unprotected sex and the perpetration of intimate partner violence.

Examination of program effects is receiving growing research attention as evidence of effectiveness has started to play a larger role in funding decisions in many areas including home visiting (Paulsell, Del Grosso, & Supple, 2014). On the contrary, there is limited research on program implementation (Durlak & DuPre, 2008). While the field should continue to examine program effectiveness – perhaps focusing on the particular subgroups of families who appear to profit from particular home visiting practices – another major task awaiting program developers and staff is to understand more fully how programs are implemented.

The resulting process-oriented information can be used to compare program operations to what is considered “best practices” for that program model or in the field in general, and then used to refine existing program models and to improve the quality of services.

Among the many elements of program operations, program engagement and the maintenance of program participation are among the most likely foci. To the extent that a home visiting program’s theory suggests that a certain amount of service is necessary for families to achieve the desired outcomes, researchers and practitioners alike are eager to discern the factors that promote service “pick-up” and participation maintenance. This dissertation, as well, is concerned with the maintenance of program participation, and I briefly review here literature from the home visiting field on this topic.

Program Engagement

The field of home visiting lacks a standard definition of participant engagement. Engagement is defined in various ways including participation, attendance, and involvement (Roost, Jones, Allan, & Dommers, 2014). Several researchers conceptualize it as a dynamic process encompassing stated intent to enroll, actual enrollment and program completion (Damashek, Doughty, Ware, & Silovsky, 2011). Some others conceptualize engagement as the amount (i.e. dosage) or length of services (Daro, McCurdy, Falconnier, & Stojanovic, 2003; Duggan et al., 2000; Roggman, Cook, Peterson, & Raikes, 2008). Still others use a broader definition which incorporates a qualitative dimension into engagement (Dumas, Nissley-Tsiopinis, & Moreland, 2007; McCurdy & Daro, 2001; Wagner,

Spiker, Linn, Gerlach-Downie, & Hernandez, 2003). This qualitative aspect of engagement captures the extent to which participants are receptive to programs and are actively involved in services (Garvey, Julion, Fogg, Kratovil, & Gross, 2006).

Engaging and maintaining families in home visiting programs are critical, as early exit from services, in theory, compromises program effectiveness. By leaving services early, families miss the opportunity to be exposed to the full range of program content and activities, which could undermine the program's impact. Indeed, evidence suggests that program effects tend to increase as home visit intensity and visit attendance increase. For instance, a meta-analysis of home visiting programs for at-risk families demonstrates that intensive programs with at least three home visits per month achieved an effect size for maternal behavior that was more than twice as high as the results for nonintensive programs (Nievar, Van Egeren & Pollard, 2010). Kahn and Moore (2010) reviewed the findings of rigorously designed evaluations of interventions with a home visiting component and found that early childhood programs were more likely to produce positive child and parent outcomes when home visits were of high intensity (i.e. four or more visits, on average, per month) compared to those of low-intensity. Evaluations also indicate that program engagement, measured by amount or duration of contact, was positively associated with child outcomes in areas of cognitive and physical development, the quality of home environment, parent supportiveness for vocabulary development and play, and child health care use (Brookes, Summers, Thornburg, Ispa, & Lane, 2006; Raikes et al. 2006;

Roggman et al., 2008; Sweet, & Applebaum, 2004; Wagner, Spieker, Hernandez, Song, & Gerlach-Downie, 2001).

However, the relationship between attendance and program effect is not always straightforward (Holland, Xia, Kitzman, Dozier, & Olds, 2014). In an evaluation of program utilization among HFM participants, we found that higher number of home visits were associated with favorable outcomes in several areas including child maltreatment, repeat birth and contraceptive use (TIER, 2015). On the contrary, high users were more likely to be in relationships in which they were subjected to intimate partner violence. Goldberg and colleagues (2016) suggest that lack of a clear dose-response relationship may be explained by the heterogeneity among participants with similar levels of service use. For instance, low-users may be the ones with greatest vulnerabilities, and those vulnerabilities may get in the way of using the services adequately. Alternatively, low users may be the ones with the most resources and use services only on a needs basis. In this case, it is reasonable to expect different outcomes between these two groups of participants which complicate the relationship between service use and program effects.

Despite the convenience of receiving services in one's home, many families tend to receive fewer visits than prescribed by programs (Ingoldsby et McCurdy al., 2013; McCurdy et al., 2006; O'Brien et al., 2012; Roggman et al., 2008). Program attrition has been studied extensively, most notably in relation to participants' background characteristics (for a review, see Korfmacher et al., 2008). Such an emphasis on individual characteristics, in particular demographics

and risk factors, can perhaps be explained by the difficulty of engaging disadvantaged families. These vulnerable families may focus primarily on meeting basic needs and this may interfere with their ability to maintain continued participation (Carbone, Fraser, Ramburuth, & Nelms, 2004; Wagner et al., 2003).

Poor housing conditions and housing instability may be a barrier to program engagement and retention as housing difficulties usually co-occur with other problems, including poverty, unemployment, poor physical and emotional health, and substance use (Bromfield, Sutherland, & Parker, 2012; Vandivere et al., 2006). In an evaluation of HFM, residential mobility emerged as a strong predictor of program utilization; participants who moved more times within the past year had shorter enrollments and received fewer visits compared to less mobile participants (TIER, 2015). In another home-based parenting and early childhood enrichment program, HIPPY, relocation out of the program's service area and unstable housing were cited by program coordinators as major challenges to retention of families (Roost et al. 2014). Similar findings were reported in an evaluation of a national home visiting program model, HFA, with one-third of participants (32%) terminating services early due to moving out of the catchment (Daro et al., 2003). However, this rate may not fully reflect the role of housing instability in program attrition, as an additional 22% of participants were reported to be lost to follow-up. Program staff's inability to locate and reach those participants might be taken as an indication of, at least to some extent, the housing problems experienced by this group.

As these two studies suggest, most participants cannot stay involved in programs when they relocate out of the service area. Yet, moves within catchment can also be a barrier to continued service use. Indeed, Roggman and colleagues (2008) found that changing residence within service area during program enrollment significantly predicted early termination of services. Moreover, relocations in the area more than doubled the likelihood of dropping out.

Family mobility, whether within or outside of the service area, is a problem for intervention programs because moves, and the resulting address changes, sometimes make it difficult for the program staff to keep track of participants. This is especially true when participants move and leave no address (Brookes et al., 2006). Additionally, tracking participants may get difficult when they bounce between family and friends and never stay in a single location for extended periods. Brookes and colleagues (2006) found that such chaotic living situations diminish the amount of participation in home visiting programs.

Studies exploring the link between mobility and program utilization usually highlight the adverse effect of moves on service dosage as indicated by length of stay in the program or the number of home visits received. However, evidence suggests that mobility undermines not only the quantity but also the quality of participation such as the extent to which participants are actively invested in program services. In a large scale evaluation of Early Head Start program (Raikes et al. 2006), mobile families who moved at least once during their program involvement had a shorter duration in the program compared to

non-movers. Moreover, compared to non-movers, movers received lower staff ratings on their overall interest in program activities.

Summarizing, research on program effectiveness continues to grow while the study of program implementation remains less robust. Nevertheless, implementation research is central to understanding why some programs fail and how they can be improved. One aspect of program implementation, engagement, is of particular consideration as both physical presence and active involvement of participants are prerequisites for program success. Previous studies have examined the association between various individual attributes and program engagement. Among those, a few focused on residential mobility as a correlate of program attrition. Notwithstanding, research on other housing difficulties in relation to program utilization is currently missing.

The investigation of two separate lines of research, housing and home visiting engagement, highlight several gaps in the literature. As this review establishes, there is a paucity of research on the housing conditions of teen mothers. A few available studies approached the subject in a piecemeal fashion, focusing solely on a single housing dimension. However, studies exploring the interrelations among multiple housing dimensions are missing. A more nuanced understanding of teen mothers' housing circumstances may aid policy makers and researchers develop effective housing interventions.

In addition to our limited understating of teen mothers' housing woes, housing has rarely been studied as a factor associated with program attrition. Identifying the reasons for program discontinuation is important as sustained

participation is considered key to program success. The current study aims to address these gaps in the literature by using a person-centered approach to uncover patterns of housing insecurity and examining how these distinct patterns are linked to program utilization.

CHAPTER 3: METHOD

In this dissertation, I examined the housing challenges faced by a sample of teen mothers in Massachusetts through analysis of secondary data from the Massachusetts Healthy Families Evaluation Cohort 2 (MHFE-2). MHFE-2 is a randomized controlled, longitudinal evaluation of Healthy Families Massachusetts (HFM), a universal home visiting program for first time parents under the age of 21.⁸ Below, I describe the general procedure used in MHFE-2. Then, I describe the sample and measures used in this dissertation. This chapter concludes with an outline of the plan for data analysis.

Overview of MHFE-2

Procedure

MHFE-2 was open to any consenting females between 16-21 years of age who previously had not received HFM services. Additional eligibility criteria included fluency in English or Spanish and being cognitively capable of providing informed consent on one's own behalf. Eligible women who consented to the study were randomly assigned to either the program group (Home Visiting Services; HVS) or the control group (Referral and Information Only; RIO). Participants assigned to the HVS group could receive home visits; whereas, participants assigned to the control group were only eligible for information and referral services. In total, 837 participants were randomly assigned at HFM sites. Of these initial recruits, 16% ($n = 133$) were excluded from the evaluation study because they expressed their desire to withdraw, or were deemed ineligible for the

⁸ For a description of the Healthy Families Massachusetts program, see <http://childrenstrustma.org/our-programs/healthy-families/>.

study or could not be located. The final sample included 704 participants, of whom 433 (62%) were in the HVS program group and 271 (35%) were in the RIO control group.

Following the random assignment, participants were invited to participate in several activities. They were initially asked to complete a half-hour interview on the phone and give consent to the release of their administrative records. Semi-structured interviews conducted over the phone served to develop a thorough understanding of participants and their contexts. Data collected during phone interviews produced key information on demographics (e.g., ethnic background, education, employment); current financial resources; living arrangements and housing conditions; use of public and social services; and maternal well-being (e.g., physical illness, reproductive health, depression).

Participants who provided at least one source of data (via the phone interview or agency data release) were invited to participate in an additional 2-2.5 hour in-depth, in-person interviews. In-person interviews consisted of a semi-structured interview, written surveys and observations of parent-child interactions; they generated data on interpersonal relationships and support networks; history of childhood abuse and neglect; intimate partner violence; and current personal functioning/well-being. Both phone and in-person interviews were conducted at three time points: Time 1 (T1) interviews were completed one month after enrollment, Time 2 (T2) and Time 3 (T3) interviews were completed about 12 and 24 months after enrollment, respectively.

Sample

The analytic sample included in the present study consisted of 563 young mothers who completed the phone interviews at T2. Of the final analytic sample, 336 participants (60%) were in the program group and 227 (40%) were in the control group. To address the first two research questions which involve establishing housing insecurity latent classes and identifying predictors of latent class membership, I used data from the full sample. Because the third research question involves the link between the housing insecurity and program utilization, relevant analyses were limited to those 336 participants in the HVS program group.

Measures

The main data sources for this dissertation were the phone interviews (T1 and T2), administrative records, U.S. Census data and the HFM management information system (called the Participant Data System; PDS). The PDS is an online database maintained by the Children's Trust. At regular intervals, home visitors and supervisors key in information into the system on program enrollees (e.g., pregnancy and birth information), service utilization (e.g., referral, the frequency and content of home visits); Individual Family Service Plan (IFSP), assessments of current child and parent functioning and discharge records (see TIER, 2015, for more detail on the measures and data sources used in MHFE-2).

Table 1 presents the list of variables used in this dissertation. Indicators of housing insecurity were derived from information collected during phone interviews about the participants' residential circumstances. Phone interviews,

self-report measures, administrative data from state's child protection agency – the Department of Children and Families (DCF), and population-level census data were used to create predictor variables including racial/ethnic background, age at childbirth, living with an adult relative/guardian, employment status, receipt of public assistance, history of maltreatment, maternal depression, substance use and neighborhood income. Data gathered from the PDS on program participation constituted the outcome measures. Length of enrollment and the number of home visits and substantive secondary activities comprised the outcome measures.

Indicators of Housing Insecurity

The indicators of housing insecurity used in this dissertation were chosen in accordance with the housing literature and the availability of the relevant housing information in the MHFE-2 database. Housing information was collected at T2 to identify the housing insecurity latent classes so that it would be possible to predict latent class membership by the baseline characteristics of the participants. In a similar fashion, use of T2 housing information made it possible to investigate how various combinations of housing challenges influence utilization of HFM services at T3.

Perceived overcrowding. Participants were asked to indicate if they considered their current living conditions as crowded. From this information a binary variable with 1 = perceived crowding, 0 = no perceived crowding was created.

Perceived housing affordability. A single item from the Family Resource Scale (Dunst & Leet, 1987) was used to determine whether participants

experience difficulties related to housing affordability. For this item, participants rated the adequacy of their resources to meet the need for housing on a 5-point scale ranging from 1 (not at all enough) to 5 (almost always enough). Response categories 1 through 3 (not at all/seldom/sometimes enough) and 4 through 5 (usually/almost always enough) were collapsed, and a binary variable was created with 1 = affordability problems and 0 = no affordability problems.

Residential mobility. Participants were asked to indicate the number of places they lived in the past year. Because residential mobility is usually operationalized as multiple moves within the past year (Cutts et al. 2011; Joyce et al. 2012; McCoy & Raver, 2014; Suglia et al., 2011), a binary variable was created with 1= at least 2 moves, and 0 = 0-1 moves.

Temporary living arrangements. Participants were asked if they had ever lived and/or are currently living in a Teen Living Program, a group home or a shelter. Based on these two pieces information, a binary variable was created that indicated having had a temporary living arrangement between T1 and T2 surveys.

Predictors

Racial and ethnic background. Race/ethnicity was identified as a potential predictor of membership in housing insecurity latent classes due to notable variations among racial and ethnic groups in experience of housing problems (HUD, 2015; Owens & Tegeler, 2007). During T1 phone interview, participants were asked to indicate their race and ethnicity by choosing the response categories provided in the 2010 census. A summary variable was

created and previously used by MHFE-2 including the following categories: non-Hispanic White, non-Hispanic Black, Hispanic and other.

Age at childbirth. Maternal age in years at childbirth was used.

Living with an adult relative/guardian. During the T1 phone interview, participants were asked to indicate whom they were living at the time of the initial data collection effort. From this information, a binary variable was created with 1 = living with and adult relative/guardian, 0 = all other living arrangements (e.g., living alone, with roommate or in a shelter).

Employment status. Employment status was reported by the participants during the T1 phone interviews. Based on this information, a binary variable was created with 1 = employed full- or part-time, 0 = not employed.

Maternal depression. The 20-item Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was used to assess depressive symptoms at T1. Using a 4-point scale (0 = “not at all” and 3 = “a lot”), respondents rated the frequency of depressive symptoms (e.g., “I felt that I could not shake off the blues even with help from my family or friends”) over the past week. A continuous scale score was created by summing the 20 items.

Substance use. The Youth Risk Behavior Survey (YRBS; Kolbe, Kann, & Collins, 1993) was used to gauge lifetime use of drugs at T1. YRBS is a self-report measure designed to assess various health-compromising behaviors among youth including violence, personal safety, suicidal thoughts, and unintended pregnancies. Based on 8 items involving use of various drugs (e.g., cocaine,

inhalants, LCD, heroin), a binary variable was created with 1 = use of at least one type of drug, 0 = no lifetime drug use.

Housing dissatisfaction. During the T1 phone interview, participants were asked if they hoped to make a change in their living situation in the next year. From this information, a binary variable was created with 1 = housing dissatisfaction, 0 = housing satisfaction

Financial assistance programs. During the T1 phone interview, participants were asked to indicate whether they used various forms of public assistance (i.e., cash or in-kind benefits including welfare, food stamps, WIC, SSI, public housing, and housing voucher) since pregnancy through T1 survey. From this information, a summary variable was created by summing the number of financial assistance programs used by participants.

Neighborhood income. The home address provided by participants during the T1 phone interviews was geocoded and linked to Census 2010 data at the block group level. Median household income of the block group in which each participant lived was used as the neighborhood income at that locale.

Dependent Variable: Program Utilization

Outcome measures included three indicators of program utilization: program duration, total number of home visits, and “substantive” secondary activities. These variables were chosen to get a more nuanced picture of how participants used program services.

Program duration. Program duration was calculated, in days, by subtracting the discharge date from the enrollment date. To calculate this

measure, only those periods when mothers were actively enrolled in a program was considered.

Total number of home visits. Total number of home visits was calculated by summing up home visits that took place between program enrollment and discharge.

Secondary activities. Secondary activities refer to any non-visit activity conducted by the home visitor or HFM staff, with, or on behalf of the participant, such as phone calls, text messages, emails, rides and delivery of goods. Home visitors are required to enter every non-visit activity into the PDS. The last outcome variable used in this dissertation—substantive secondary activities—is a subset of secondary activities that was previously used in MHFE-2 (TIER, 2015). A secondary activity was coded as “substantive” when (a) the activity included both the participant and the home visitor or other HFM staff, (b) there was a verbal connection between the parties (with the exception of texting which was also included in the verbal connection category), and (c) the parties did not communicate only for scheduling purposes.

Data Analytic Plan

In this section I describe the analytic procedures used to answer each research question. All analyses were conducted using MPlus version 7.4 (Muthén & Muthén, 1998-2015). To account for missing data, full-information likelihood estimation (FIML) was used. FIML uses all available data to estimate model parameters and has been shown to produce reliable parameter estimates and standard errors when data are missing at random (Schafer & Graham, 2002).

However, FIML cannot accommodate missing values on covariates and grouping variables (Collins & Lanza, 2010). For this reason, listwise deletion was used for cases with missing values on covariates of interest.

Research Question 1: Can Subgroups of Teenage Mothers, Characterized by Qualitatively Different Housing Challenges, Be Identified? If so, What Do Those Subgroups, or Latent Classes, Look Like?

To address the first research question, I used latent class analysis (LCA). LCA is a person-centered statistical approach used to classify individuals into homogenous subgroups called latent classes (Collins & Lanza, 2010). Latent classes are not observed but inferred from patterns of responses to a set of categorical indicators (Lanza & Cooper, 2016). The primary objective of LCA is to identify the smallest number of latent classes that can sufficiently explain the differences in observed response patterns (Geiser, 2013). This is accomplished by sequentially fitting models with increasing number of latent classes and comparing them by considering multiple indicators of model fit and interpretability.

Model fit indexes are distinguished on whether they assess absolute fit or relative fit. Absolute fit refers to the ability of a specified model to reproduce the observed data. Relative fit indicates how well a given model fits in comparison to competing models (Geiser, 2013). There are a number of different absolute and relative fit indexes used for selecting the best fitting model. Here I discuss only those that are available in Mplus. A common measure of absolute fit is the likelihood ratio Chi square goodness-of-fit test (χ^2_{LRT}) where the null hypothesis

is that the LCA model adequately fits the data. A significant p value indicates poor model fit (Agresti, 2002).

One can use information criteria and statistical tests to assess relative model fit. Information criteria (IC) are used to compare models, regardless of whether models are nested or non-nested, by taking into account both the model fit and model parsimony (Collins & Lanza, 2010). In terms of IC, the best model is the one that fits the data adequately and uses as few parameters as possible. As a default, Mplus reports three IC: The Akaike information criterion (AIC; Akaike, 1987), the Bayesian information criterion (BIC; Schwarz, 1978), and the sample-size adjusted BIC (SABIC; Sclove, 1987). Across a number of models, the model with the smallest AIC, BIC, and SABIC is preferred.

Bootstrap likelihood ratio (BLRT; Nylund, Asparouhov, & Muthén, 2007) and Lo-Mendel-Rubin test (LMR; Lo, Mendell, & Rubin, 2001) are used to compare nested models with $k-1$ and k classes. Both BLRT and LMR provide a p value that indicates whether the model fit improves with the inclusion of an additional class. Under the null hypothesis, there is no difference between the models. Failure to reject the null hypothesis implies that the model with $k-1$ classes would be retained as it is the more parsimonious one with comparable fit. A significant p value indicates that the model with k classes would be favored over the model with one less latent classes (Masyn, 2013).

Following the recommendation made by Collins and Lanza (2010), I based my model selection on fit statistics described above as well as the interpretability of candidate models. In general, the ease of interpretability is

evaluated by the size of item response probabilities. Item response probability refers the probability of observing a particular response to a particular item given membership to a particular latent class (Collins & Lanza, 2010). In other words, item response probability indicates the likelihood that class members would provide the same response to a particular indicator. A model is easy to interpret when item response probabilities are either high or low (i.e. close to 1 or 0) within a latent class. On the contrary, medium-size item response probabilities suggest lack of distinctive response patterns within a latent class.

Research Question 2: Do Selected Attributes (i.e., Race/Ethnicity, Age at Child Birth, Living with an Adult Relative/Guardian, Employment Status, Receipt of Public Assistance, Childhood History of Maltreatment, Depression, Substance Use, Housing Dissatisfaction and Neighborhood Income) Predict Membership in Housing Insecurity Latent Classes?

Following model selection, I addressed the second research question by using a three-step approach. According to this approach, first the latent class model was estimated using only latent class indicators. In the second step, a nominal class membership variable was created using modal assignment (i.e. assigning individuals to their most probable latent class). In the third step assigned class membership was regressed onto the predictor, taking the classification uncertainty into account (Asparouhov, & Muthén, 2014).

The multinomial logistic regression framework used in the third step included both categorical and continuous variables as covariates. Categorical variables were dummy coded and continuous measures were centered around their

means prior to entry into regression as predictors. The multinomial logistic regression analysis provided estimates of the coefficients in log units. Those coefficients were exponentiated to obtain odd ratios. For a categorical variable, the value of the odds ratio reflects the relative probability of membership in a given class in relation to the reference class when the value of covariate equals one versus zero. Let's suppose we are examining the effect of a covariate, deviant peer affiliation, on membership in risky behavior latent classes. If the covariate is coded as 1 = "yes" and 0 = "no", then the odds ratio is the likelihood of being in a given latent class in relation to the reference class for those who were affiliated with deviant peers versus those who did not. For a continuous variable, the value of log odds represents the change in relative likelihood of membership in given class in relation to the reference class for a one-unit increase in the covariate.

Research Question 3: Do Teenage Mothers Who Can Be Characterized by Different Housing Insecurity Latent Classes Use Home Visiting Services Differently?

For my third research question, I examined the associations between latent class membership and the selected outcome variables. Similar to covariates, distal outcomes can be introduced into the LCA model to examine how class membership predicts the distal outcome(s). To accomplish this, the initial analytic plan was, once again, to use a three-step approach. However, due to the non-normal distribution of outcome variables, a decision was made to use count regression models to predict the effect of modal class assignment on outcomes. Count regression models are appropriate for count variables that are non-negative

integers and are often positively skewed (Atkins & Gallop, 2007). One such model is the negative binomial regression model (NB). NB is a good fit for highly skewed data. However, when there many observations at zero, an alternative approach, hurdle model may be more appropriate (Atkins, Baldwin, Zeng, Gallop, & Neighbors, 2013). The hurdle model is a two-part model in which zeros in the data are handled in the first part by logistic regression and then a count regression is conducted to model non-zero values (Atkins et al., 2013). As there were only a few observations at zero for the first outcome of interest, duration in the program, negative binomial regression was used to test the association between modal class assignment and the program duration. For the remaining two outcomes, the number of home visits and of substantive secondary activities, I used the hurdle model due to a large number of zeros in the distribution of those variables. I first ran the main effect models without covariates, then with selected covariates to determine whether housing latent classes contribute to program utilization above and beyond the factors that are related to program utilization. Covariates used in this step were selected on the basis of MHFE-2 findings (TIER, 2015) and included race/ethnicity, living with an adult relative at T1, pregnancy status at enrollment, receipt of food stamps and maternal depression.

CHAPTER 4: RESULTS

Background Characteristics

Table 2 displays detailed information regarding the background characteristics, housing conditions and service utilization of participants. Participants averaged 18.6 years old when they enrolled in the program. Over two-thirds of the full sample identified themselves as non-Hispanic White or Hispanic (37% and 34%, respectively); the remainder self-identified as non-Hispanic Black (20%) or non-Hispanic Other (8%). The majority of participants (76%) indicated that English was their preferred language, while 20% chose English and another language and 4% Spanish only. Most participants were born in the United States (82%), specifically in Massachusetts (69%). About two-thirds of the participants (66%) enrolled in the program while pregnant. Participants were, on average, 18.8 years old at the birth of their first child.

During interviews conducted at baseline, one-fifth of the participants (21%) reported living with an adult relative or a guardian. Approximately a quarter of the participants (24%) were employed. On average, participants used more than one financial assistance program ($M = 1.39$, $SD = 1.01$). Several conditions highlighted the vulnerabilities of the study sample. Over half of participants (56%) had a history of maltreatment in their childhood; one-fifth reported using at least one type of drug in the past and, directly pertinent to this study, an overwhelming majority (80%) was dissatisfied with their current housing. The average depression score on CES-D ($M = 14.14$, $SD = 10.69$) was close to the cut-off score of 16 indicating clinical depression. The median

household income of the block group in which participants resided was \$48,862 ($SD = 26,786.50$).

Descriptive Analysis of Housing Conditions and Program Utilization

As noted earlier, housing dissatisfaction was prevalent in the study sample, with a larger majority of the participants (80%) expressing a desire to change their current housing condition. The most common housing challenge reported by participants was perceived overcrowding (23%). Nearly one-fifth of participants (17%) indicated housing instability, in that they reported moving two or more times in the past year. To a lesser extent, there were reports of temporary living arrangements (14%) and perceived affordability problems (9%).

The average duration in the program among study participants was 494.5 days (almost 17 months, $SD = 401.82$), with a large spread, ranging from 0 to 1,363 days (approximately 45 months). The median number of days in HFM was lower (335.5), however, indicating that the mean was inflated by a group of participants who enrolled in the program for extended periods. Participants received an average of 27 home visits ($SD = 27.47$) during their involvement in HFM. This number varied greatly, from 0 to 118 with a median of 16 home visits. On average, participants involved in 10.7 substantive secondary activities ($SD = 17.68$). The median number of substantive secondary activities was 5. However, the number of substantive secondary activities varied considerably from participant to participant (range 0-138).

Relations among Study Variables

Correlations among selected background characteristics and housing challenges are provided in Table 3. Small, positive associations were found among different aspects of housing. The strongest association was observed between residential mobility and temporary living arrangements ($r = .29$). Perceived affordability problems had significant associations with all other housing challenges, whereas perceived overcrowding had the fewest associations and was only linked to perceived affordability.

Various baseline characteristics of the participants were linked to housing challenges. For instance, White status was associated with fewer housing challenges, with the exception of residential mobility ($r = .06, p = .15$). Hispanic background had only one significant positive association, with perceived overcrowding ($r = .10$), whereas Black status had both positive and negative associations with housing challenges. Living with and adult relative/guardian had negative associations with residential mobility ($r = -.13$) and temporary living arrangements ($r = -.25$). On the contrary, the number of financial assistance programs and having a history of maltreatment in childhood were positively associated with the very same housing challenges. Housing dissatisfaction predicted housing challenges in all areas. Individual characteristics that were positively associated with housing dissatisfaction included number of financial assistance program ($r = .13$), history of maltreatment ($r = .19$) and depression ($r = .11$), whereas White status and being employed both had negative associations with housing dissatisfaction ($r_s = .12$ and $.13$, respectively). The last variable that

was linked to housing challenges was neighborhood income, which had a negative association with perceived overcrowding ($r = -.09$).

Correlations among housing challenges and service use are presented in Table 4. The results indicated no significant associations between housing challenges and measures of program utilization. The duration of participation had a strong positive association with number of home visits ($r = .93$) and a moderate positive association with substantive secondary activities ($r = .47$). Likewise, a moderate positive association was found between the number of home visits and secondary activities ($r = .49$).

Research Questions

Research Question 1: Can Subgroups of Teenage Mothers, Characterized by Qualitatively Different Housing Challenges, Be Identified? If so, What Do Those Subgroups, or Latent Classes, Look Like?

To assess the potential presence and nature of housing latent classes, I started by examining six- and five-indicator latent class models. In addition to the indicators described previously, these models also included receipt of housing assistance and housing dissatisfaction as indicators of housing insecurity.

However, after initial exploration of the latent class solutions, I decided to drop housing assistance as an indicator due to the low probability of its endorsement within latent classes (i.e., when this indicator was included, no latent classes had any substantial probabilities of endorsing it). I also decided to exclude housing dissatisfaction as an indicator because it did not differentiate well among the latent class solutions. In other words, *a high probability of housing*

dissatisfaction was present in all latent classes, despite considerable variability in presence of housing dissatisfaction among study participants in general.

Accordingly, I decided to estimate the latent classes with four indicators. I then ran models with two through five latent classes. Results of the fit statistics indicated that the three- and four-class solutions were the most plausible models (Table 5). These two solutions provided similar fit to the data. The three-class solution had slightly lower AIC, BIC and SABIC values than did the four-class solution. Whereas the LMR and BLRT indicated that the three-class solution was a good fit and an additional fourth class did not provide a statistical improvement in the fit of the model, entropy was much higher for the four-class solution than for the three-class solution. In order to choose the final model, I also considered the interpretability of resultant classes. In the three-class solution, there was one class with few housing difficulties and two classes characterized by the presence of a major housing challenge. However, those two latent classes were difficult to interpret and label due to the presence of item response probability values in the mid-range (i.e. ranging between 0.3 and 0.7). On the other hand, the four-class solution represented all possible housing challenges and, except for the largest latent class with no substantial housing challenges, each latent class was characterized by a combination of a major and a minor housing challenge. Based on these considerations, I chose the four-class model⁹. Figure 1 provides a graphical representation of the four-class solution.

⁹ Although entropy for four-class model was high and the resultant latent classes were substantively meaningful, the small size of three of the four latent classes was a source of concern. To address this potential problem, I compared the latent class prevalences to the percentage of

Based on my review of the literature on teenage parenting and the housing circumstances of young families, I hypothesized that I would find the following patterns in housing challenges encountered by teen moms: (a) affordability problems in combination with perceived overcrowding; (b) affordability problems in combination with residential mobility; (c) temporary living arrangements; and (d) no substantial housing challenges.

As hypothesized, there was a latent class characterized by a low probability of endorsing any housing challenges and it was also the largest class (82%). I labeled this class as Few Housing Problems (FHP). The second largest class (8%) was labeled as Perceived Affordability Problems (PAP), as there was a perfect probability of endorsing this problem in this latent class. To a certain extent, affordability problems were likely to co-occur with perceived overcrowding in this latent class. This latent class was similar to the hypothesized latent class combining affordability problems and perceived overcrowding. However, the probability of endorsing household overcrowding in that latent class was lower than hypothesized.

The third largest class (6%) represented residential mobility (RM). Teen mothers in this class had a perfect probability (1.0) of having experienced

participants in the full sample, who reported experiencing both the major and the minor housing challenges characterizing each latent class. For example, the prevalence of the “TLA” latent class was 5%. The major housing challenge characterizing this latent class was having a temporary living arrangement, and the minor housing challenge was residential mobility. In the full sample, 6% of the participants reported experiencing both problems, which was slightly higher than the latent class prevalence. In two of the three small latent classes, class prevalences were comparable to the percentage of participants endorsing the corresponding housing challenges. Only in the “perceived affordability” latent class, latent class prevalence (8%) was considerably higher than the percentage of participants reporting the corresponding problems in the full sample (4%). Thus, I concluded that the small sizes of the latent classes were not a concern because the proportion of participants reporting each of the corresponding challenges in the overall sample was also small.

residential mobility in the past year. Contrary to my expectations, residential mobility did not co-occur with affordability problems in this latent class. Instead, participants displayed low to moderate levels of endorsement of items assessing perceived overcrowding and having a temporary living arrangement. The final latent class was in line with the hypothesized class of temporary living arrangements, and equaled 5% of the sample. In addition to a near perfect likelihood of having a temporary living arrangement, there was endorsement, to a moderate extent, of residential mobility in this latent class.

Research Question 2: Do Selected Attributes (i.e., Race/Ethnicity, Age at Child Birth, Living with an Adult Relative/Guardian, Employment Status, Receipt of Public Assistance, Childhood History of Maltreatment, Depression, Substance Use, Housing Dissatisfaction and Neighborhood Income) Predict Membership in Housing Insecurity Latent Classes?

Table 6 presents the results from the multinomial logistic regression models relating latent class membership to relevant covariates. There were few statistically significant associations between background characteristics and latent class membership. In line with Hypothesis 2a asserting that living with an adult relative/guardian would predict membership in the "secure housing" latent class, those who lived with an adult relative/guardian at T1 were 79% less likely to be in TLA latent class compared to the FHP latent class (OR = 0.21). As for public assistance, I hypothesized that receipt of public would predict membership in the perceived affordability and mobility latent class. However, I found that receipt of each additional financial assistance program at T1 increased the likelihood of

being in TLA latent class in comparison to FHP latent class by almost two times (OR = 1.95). I also predicted a lower odds of membership in the “secure housing” latent class when the housing dissatisfaction is high. Results confirmed and expanded this insight. Teenage mothers who were dissatisfied with their housing at T1 were most likely to be in TLA latent class compared to all other classes. In addition, those who were dissatisfied with their housing at T1 were almost four times more likely to be in PAP latent class in comparison to FHP latent class (OR = 3.71). No other differences were found on the basis race/ethnicity, mother’s age at childbirth, employment status, history of childhood maltreatment, maternal depression, substance use, or neighborhood income.

Research Question 3: Do Teenage Mothers Who Can Be Characterized by Different Housing Insecurity Latent Classes Use Home Visiting Services Differently?

Before running the LCA with distal outcomes, I examined whether the final four-class model based on the full sample also applied to the participants who received home visiting services, as this last set of analyses was limited to this group. Fit statistics results were similar to those of the full sample. AIC, BIC and SABIC were slightly lower for the three-class solution than for the four-class solution. According to the LMR and BLRT, the three-class solution was more parsimonious than the four-class solution (i.e., adding the fourth class did not result in a statistically significant improvement in model fit). On the contrary, the four-class solution had higher entropy than did the three-class solution.

As in the full sample, the latent classes in the four-class solution were more interpretable than the ones in the three-class solution. With the three-class solution, latent class analysis may not even be needed as in each class, a main housing problem was observed rather than a combination of multiple problems. Next, I compared the four-class solutions based on the full sample and home visiting group. To a large extent, class proportions and item response probabilities were comparable in the full sample and HVS group. Thus, I confirmed that the four-class solutions based on the full sample and home visiting group were very similar in terms of both model fit and substantive meaning. In the next step, I regressed the latent class indicators on HVS/RIO group status to test measurement invariance. I found no associations between group status and latent class indicators in any of the latent classes, suggesting that item-response probabilities did not differ by HVS/RIO group status. After obtaining evidence of measurement invariance, I then proceeded to the LCA with distal outcomes. The upper panel of Table 7 shows results from the negative binomial model for program duration. Coefficients reported in the table are on log scale and need to be exponentiated to be interpreted.

Based on MHFE-2 findings, I was expecting to find the highest program utilization, as assessed by duration, number of home visits and secondary activities, in the “secure housing” latent class, with lowest program utilization reported for teenage mothers in the “perceived affordability and residential mobility” latent class. As described below this expectation did not hold true for any measure of the program utilization. The coefficient for each latent class

indicates the change in the predicted program duration from the reference category (i.e., FHP latent class) to the category coded 1 (i.e. TLP, PAP, or RM). Transformation of the coefficients for PAP ($e^{0.10} = 1.11$) and RM ($e^{-0.23} = 0.80$) showed that, in comparison to the FHP latent class, the predicted average duration was 11% higher in the PAP latent class and 20% lower in the RM latent class. However, neither of these differences was statistically significant. On the contrary, membership in TLA latent class, in comparison to the FHP latent class, was associated with a significantly lower value for program duration (36% lower, $p = .04$). Figure 2 presents a graph of the estimated mean duration in the program across the four housing latent classes.

The middle panel of Table 7 shows results from a hurdle model of home visits. The first step of a hurdle model uses logistic regression to predict values of zero for the dependent variable (i.e., whether a participant has “any” of the dependent variable, compared to having “none” of it). In the second step, non-zero counts are modeled via ordinary least squares (OLS) regression (i.e., for individuals with a value of one or more on the outcome variable, the model predicts “how much” of the outcome the participant has based on the predictors). Regression coefficients from a hurdle model are on log scale. Similar to the negative binomial model, raw coefficients are exponentiated and interpreted as odds ratios.

Result of logistic regression analysis in step one showed that latent class membership had a significant relation with the probability of receiving any home visits (compared to receiving no visits). When the intercept coefficient was added

to the coefficients for TLA and RM latent classes and the resulting sums were raised to the base of e , odds of no home visits in both classes were found to be zero. This finding indicated that there were no individuals in either latent class who did not receive any home visits (i.e., everyone in those latent classes received at least *some* home visits). Accordingly, the odds of receiving no home visits in the TLA and RM latent classes were significantly lower in comparison to the FHP latent class ($ps < .001$). In the count portion of the model (i.e., step two), latent class membership did not significantly predict the number of home visits among participants who had received at least one visit. (See Figure 3 for the expected number of home visits.)

Hurdle model results regarding the substantive secondary activities are reported in the lower panel of the Table 7. The logistic regression part of the model revealed a significant relation between the TLA latent class and non-occurrence of substantive secondary activities. The odds of no secondary activities in TLA latent class was near zero and significantly lower than the odds of no secondary activities in FHP latent class ($p < .001$). In the counts part of the model (i.e., step two), no significant differences were found in the predicted number of substantive secondary activities across latent classes. (See Figure 3 for the expected number of substantive secondary activities.)

In the next step, I introduced the covariates into the regression models. The purpose of these analyses was to determine whether housing latent class membership contributed to program utilization above and beyond the factors that are known to be related to program utilization. Covariates used in this step

included race/ethnicity, living with an adult relative at T1, pregnancy status at enrollment, receipt of food stamps and maternal depression. Table 8 presents the results of these models.

Because of dummy-coding and the centering of variables, the intercept in Model 1 represents the predicted program duration for individuals who have zeros on binary variables (i.e. a person who is White, not living with an adult relative/guardian at T1, pregnant at enrollment and not receiving food stamps since becoming pregnant) and the average score on the only continuous variable, depression. In this model, three variables were significant predictors. By exponentiating each, it was found that the expected duration in the program was higher among Black and Hispanic participants (ORs = 1.22 and 1.31, respectively) in comparison to White participants. On the contrary, participants who enrolled in the program after childbirth were predicted to stay in the program for a shorter duration compared to those who enrolled prenatally (OR = 0.79). Latent class membership was not a significant predictor of program duration anymore after statistical controls were applied. (See Figure 4 for the estimated program duration across classes.)

In the logistic portion of Model 2, TLA and RM latent class membership still had a significant relation with the odds of receiving no home visits. Odds ratios took on values close to zero for the coefficients for the TLA and RM latent classes, which indicated that receiving no visits was not likely among participants in TLA and RM latent classes in comparison to the FHP latent class. In the count portion, Hispanic origin and pregnancy status had a significant relation with

number of home visits. Compared to White status, Hispanic status was associated with a higher number of expected number of home visits by 36%. Program enrollment after childbirth was associated with a 26% lower expected number of home visits compared to prenatal enrollment. Latent class membership was not related to the estimated number of home visits. (See Figure 5 for the adjusted means of home visits across latent classes.)

As shown in the lower panel of Table 8, membership in the TLA latent class (compared to the FHP class) was the only significant predictor of reporting no substantive secondary activities. As indicated by a large, negative regression coefficient, reporting no secondary activities was much less likely in TLA latent class compared to FHP latent class (OR = 0.00). Results of the counts portion showed that compared to White status, Black status was associated with almost twice the number of expected substantive secondary activities (OR = 1.67) and Hispanic origin almost by three times (OR = 2.73). Once again, latent class membership did not predict the expected number of substantive secondary activities. (See Figure 5 for the adjusted means across latent classes.)

Due to the small size of three of the four latent classes, it is possible that I did not have enough power to detect the differences across latent classes on various measures of program utilization. For this reason, I examined the effect size of the standardized mean differences. Cohen's *d*, an estimate of standardized mean difference, is computed by dividing the difference between two means by their pooled standard deviation. An effect size of 0.2 is considered small, 0.5 is considered medium and 0.8 is considered large (Cohen, 1988).

Effect sizes based on differences between means on program utilization outcomes are provided in Table 9. The analysis was limited to the models without covariates as it was not possible to compute the standard deviations for the adjusted means. There were small and medium effect sizes for the difference in means on measures of program duration and completed home visits. On the contrary, effect sizes for mean differences on the number of secondary activities were trivial in size—not even enough to be registered as a small effect. The primary finding, based on effect sizes, was that overall program utilization (excluding substantive secondary activities) was lowest in TLA latent class. In addition, teen mothers in RM latent class had shorter average program duration compared with their counterparts in PAP and FHP latent classes. These results suggest that membership in latent classes characterized by housing instability was a risk to sustained engagement in home visiting programs.

CHAPTER 5: DISCUSSION

The purpose of the current study was to uncover the patterns of housing challenges experienced by teen mothers and elucidate the link between these patterns and the use of HFM home visiting services. Findings from this study may help inform the development of targeted policies to improve the housing conditions of young families and facilitate their engagement in home visiting programs. The chapter starts with a summary of the key findings. A discussion on study's implications and limitations is followed by suggestions for future research.

Sample Characteristics

The sample demographic characteristics in this study reflected those of the parent evaluation (MHFE-2): Most participants were born in the U.S., proficient in English, and native to Massachusetts. White non-Hispanic participants constituted the largest share of the study sample (37%), followed by Hispanic (34%) and black (20%) participants. Consistent with the HFM program goals, two-thirds of the participants (66%) were recruited prenatally. As a group, participants were nearing their twenties at the birth of their first child ($M = 18.8$, $SD = 1.25$). Several risk factors were common among study participants, including a history of childhood maltreatment, drug use and high levels of depression. In addition, most participants had difficulty meeting their basic needs as indicated by use of more than one public assistance program, on average, per participant ($M = 1.39$, $SD = 1.01$).

Housing Characteristics

Results indicated that many teen mothers were discontent with their housing and experienced several housing challenges. Overall housing dissatisfaction in the study sample was high. Four out of every five young women participating in the study expressed a desire to change their current housing situation. The most common housing challenge reported by the participants was perceived overcrowding (23%), followed by residential mobility (17%), temporary living arrangements (14%) and unaffordable housing (9%). Examination of the relations among housing characteristics indicated that the most common housing challenge, perceived overcrowding, had the fewest connections with other housing challenges—it was only positively associated with unaffordable housing—whereas the least common problem, unaffordable housing, was related to all three other housing challenges. In other words, participants who lacked adequate resources to meet their housing need also tended to live under crowded conditions, move multiple times, and have temporary living arrangements.

Housing conditions were linked to several characteristics of the participants. Among those, the most notable one was housing dissatisfaction. Housing dissatisfaction was positively associated with all four housing difficulties. Similarly, minority status, history of childhood maltreatment, depression, and use of public assistance programs were associated with one or more housing challenges, confirming that insecurely housed individuals experience multiple adversities (Bromfield et al., 2012; Vandivere et al., 2006).

On the other hand, White status, living with an adult relative/guardian and being employed were associated with lower rates of housing challenges.

Latent Classes of Housing-Related Challenges

The LCA results revealed four latent classes of housing-related challenges. To a great extent, these latent classes confirmed the first study hypothesis. As anticipated, there was a latent class, *Few Housing Problems*, characterized by no endorsement of affordability problems and a very low likelihood of other housing challenges. However, it was somewhat surprising that such a large proportion of the participants (82 %) were represented in this latent class. This finding was at odds with few existing studies on this topic, emphasizing the housing woes of teen mothers (Cooke & Owen, 2007; Saadeh et al., 2013).

The second largest class, *Perceived Affordability Problems*, was distinguished by full endorsement—in essence a perfect probability—of perceived affordability problems. Problems related to perceived overcrowding were most likely in this latent class compared to other latent classes. Co-occurrence of affordability problems and perceived household crowding was consistent with the first hypothesis and suggests that teen mothers coping with economic challenges perhaps shared a living quarter with others to reduce housing costs.

The third largest latent class, *Residential Mobility*, differed notably from the anticipated pattern that combines affordability problems with residential mobility. The distinguishing features of this latent class were the full endorsement of moving multiple times in the past year and no endorsement of perceived affordability problems. Because unaffordability does not seem to be a

potential reason for the moves for this group, it is possible that these teen mothers moved around due to interpersonal conflicts they experienced in their families of origin, or in other previous households. A current qualitative study examining adolescent mothers' mobility experiences (Elliott, Shuey, Zaika, Mims, & Leventhal, 2016) revealed a similar mobility pattern. This pattern involved "horizontal moves," or back-and-forth moves between the family of origin and the family of the father of the baby (FOB). Often, these moves were motivated by the conflicts that teen mothers had in their relationships with their own mothers. In other cases, finding alternative parent figures in FOB's households and establishing close interpersonal relationships with FOBs family were the motivating factors behind the horizontal moves.

The smallest latest class, *Temporary Living Arrangements*, also confirmed a priori assumptions and represented problems associated with housing instability—that is, temporary living arrangements (i.e., having lived in a Teen Living Program, shelter or group home) and residential mobility. There was no endorsement of perceived overcrowding in this latent class. Provided that temporary living arrangements involve group-living situations, it is possible that these mothers actually lived in crowded conditions but did not necessarily perceived crowding as a problem while dealing with other, bigger challenges, such as keeping a roof over their heads.

Predictors of Latent Class Membership

Results of multinomial logistic regression models suggested few differences in latent class membership based on participants' baseline

characteristics. Among those differences, however, were the following: Teen mothers who were living with an adult relative/guardian at T1 were almost five times more likely to be in *Few Housing Problems* latent class compared to the *Temporary Living Arrangements* latent class at T2. The second predictor of latent class membership was the use of financial assistance programs. In comparison to the *Few Housing Problems* latent class, the odds of membership in the *Temporary Living Arrangements* latent class roughly doubled with each additional financial assistance program. Results also indicated that teen mothers who expressed their dissatisfaction with their housing conditions at T1 were most likely to be classified into the *Temporary Living Arrangements* latent class compared to all other latent classes. In addition, housing dissatisfaction was associated with a greater likelihood of membership in the *Perceived Affordability Problems* latent class compared with the *Few Housing Problems* latent class. Taken together, these findings suggest that living with an adult relative perhaps served as a *protection against* housing instability, whereas reliance on financial aid and housing dissatisfaction were *precursors to* housing instability and affordability problems.

Program Utilization Outcomes

There were only a few statistically significant differences on measures of program utilization across the latent classes. Membership in the *Temporary Living Arrangements* latent class, compared to the *Few Housing Problems* latent class, was associated with shorter duration in the program. However, the difference between the *Temporary Living Arrangements* and the *Few Housing*

Problems latent classes in average program duration was no longer statistically significant when controls (i.e. race/ethnicity, living with an adult relative at T1, pregnancy status at enrollment, receipt of food stamps and maternal depression) were included.

Despite the lack of statistically significant findings for most utilization outcomes, average program duration and completed home visits seemed to vary across latent classes. The *Temporary Living Arrangements* latent class had the lowest overall program utilization, with mothers staying in the program approximately for 11 months and completing 20 home visits. Teen mothers in the *Perceived Affordability Problems* and *Few Housing Problems* latent classes, who had the high overall program utilization, used home visitation services roughly half a year longer than their counterparts in the *Temporary Living Arrangements* latent class ($M_s = 17$ and 16 months, respectively). Similarly, they completed, on average, 1.5 times as many home visits as their counterparts in the *Temporary Living Arrangements* latent class ($M_s = 31$ and 30 home visits, respectively). These group differences did not translate into statistical significance, probably because of lack of power due to small sizes of the *Temporary Living Arrangements* and *Perceived Affordability Problems* latent classes. However, investigation of effect sizes, which ranged in magnitude from small to medium, provided further evidence for substantive group differences on program duration and number of home visits.

Although high overall program utilization in the *Few Housing Problems* latent class was understandable and may be attributed to the stability linked to

access to affordable, stable housing, the finding indicating highest overall program utilization among teen mothers in the *Perceived Affordability Problems* latent class was somewhat unexpected. Affordability problems are usually succeeded by more severe housing challenges including residential relocations and homelessness (Jelleyman & Spencer, 2008; Curtis et al., 2013). For this reason, one may expect to observe, ultimately, more similar utilization outcomes in *Perceived Affordability Problems* latent class as in the *Residential Mobility* and *Temporary Living Arrangements* latent classes. However, as I used a subjective measure to assess housing affordability, it is possible that those teen mothers who reported difficulty in meeting their housing needs did not necessarily have more affordability problems but were rather more aware of these challenges.

Based on hurdle models, some additional differences were noted across latent classes in the probability of non-occurrence of home visits and substantive secondary activities. Teen mothers in the *Temporary Living Arrangements* and *Residential Mobility* latent classes, compared with the ones in the *Few Housing Problems* latent class, were more likely to receive at least one home visit. In a similar fashion, membership in the *Temporary Living Arrangements* latent class, in comparison to the *Few Housing Problems* latent class, was associated with a higher likelihood of completing at least one substantive secondary activity. Moreover, these differences remained statistically significant when statistical controls for race/ethnicity, living with an adult relative/guardian, pregnancy status at enrollment, receipt of food stamps and maternal depression were included. In accordance with an earlier study demonstrating the link between service necessity

and receipt of at least one home visit (McCurdy et al., 2006), these findings may reflect a greater need for home visitation services among teen mothers in the *Temporary Living Arrangements* and *Residential Mobility* latent classes than those who are in the *Few Housing Problems* latent class. These participants probably perceived some benefit of home visiting services and made themselves available at least for one home visit. Unfortunately, however, their program involvement was cut short, despite their desire to engage in an initial home visiting, presumably due to disruptions in their lives caused by multiple moves and temporary living arrangements.

Implications and Conclusions

This dissertation involved two constituent policy arenas—housing and home visiting. In the next section, I discuss the implications of the study findings for each arena.

Housing Programs and Policy

Housing is one of the most fundamental human needs and is crucial to good health, psychological well-being, and economic success (The Public and Affordable Housing Research Corporation [PAHRC], 2016). “Without stable shelter,” Desmond (2016) writes, “everything else falls apart” (p. 300). Unfortunately, findings of this study highlight the high rates of housing dissatisfaction among teen mothers. More than three-fourths of the study participants expressed a desire to change their housing condition at the baseline, T1 interview. Moreover, housing dissatisfaction predicted future housing insecurity, specifically temporary living arrangements and perceived affordability problems. Similarly, use of an increasing number of financial assistance programs was also associated with higher risk of housing instability as manifested by temporary living arrangements.

Taken together, these findings underscore the potential need for housing support among teen mothers, particularly those who are not content with their current housing conditions and have limited financial resources as indicated by reliance on public assistance. Enhancing permanent supportive housing options could be a way to address the housing needs of this population.

Permanent supportive housing links housing assistance with social services such as case management, job training, and mental health services. Supportive housing may involve a project-based model which accommodates tenants in a single building where on-site case management services are available. Alternatively, scattered site model provides rent subsidies for a private-market apartment coupled with outreach from social workers (United States Interagency Council on Homelessness [USICH], 2017).

Permanent supportive housing has proven effective among homeless adults (Pearson, Locke, Montgomery, & Buron, 2007) and could work well if targeted to parenting teens in need of safe, affordable, decent housing. Permanent supportive housing provides a better alternative to TLPs due to several differences between the two models. Unlike TLPs, permanent supportive housing does not have any time limit restrictions and tenants may live in their homes as long as they abide by the terms of their lease (Durham, 2003). Additionally, permanent supportive housing differs from TLPs in that tenancy is not tied to participation in services offered along with housing (USICH, 2017).

The major benefit of the permanent supportive living is its built-in capacity to promote independence in young parents in the presence safety networks. Because tenancy is tied to upholding lease agreement, young residents would have the opportunity to learn the rights and responsibilities they have as tenants. As there is no time pressure to move out, young adults might take as much time as they need to build independent living skills. Permanent supportive housing also could promote autonomy in young residents by letting them to make

their own decision on the type of services they may or may not want to participate.

The very same features of permanent supportive housing which makes it a feasible model for young adults can also raise concerns. Lack of time limits on tenancy may create a situation in which some residents age in place (Durham, 2003). It is also possible that tenants may skip social services altogether as it is not a condition to retain housing. Durham (2003) suggests imposing a time limit on the duration of rent assistance and services while bestowing the right to continue living in the same place after the time limit is up as long as the residents can afford the rent without subsidies. To ensure service participation, programs should offer services that are relevant and responsive to parenting teens with an emphasis on core components including education, child care, job training, and crisis intervention.

Another potential avenue to provide housing support to young families is the expansion of housing assistance programs, in particular, the Housing Choice Voucher Program, which has been demonstrated to be a more cost-efficient way of addressing the housing needs of low-income families compared with project-based assistance (Currie, 2008; Olsen, 2003). Housing all families who qualify for the voucher program is undoubtedly costly. According to the Congressional Budget Office (2015), universal housing voucher for all families with established housing need—those making less than 50% of their area median—would cost \$41 billion annually. Although this a high figure, the cost of universal voucher program is likely to be partially offset by prevention of costs incurred to the

families, communities and the national economy by lack of affordable housing (Desmond, 2016). Rental assistance has been shown to reduce the housing cost burden for low-income families, improve educational and vocational outcomes, and contribute to physical and mental health (PAHRC, 2016). For this reason, it can be argued that expanded voucher program would eventually result in substantial savings through increased housing stability, sustained employment and reduced health care costs.

Expansion of the housing vouchers would deepen the need for affordable housing which is already in short supply (HUD, 2015). Therefore, federal government should continue to invest in preservation and development of privately-owned, affordable housing units for low-income families. Increased demand for housing resulting from the expansion of the program may also lead to increases in rents, especially in areas with a low stock of available housing units (Congressional Budget Office, 2015). Another factor that may drive up the rents is the overcharging of the rent assisted families by landlords. A recent study found that voucher holders are charged \$51 to \$68 more each month in rent than the unassisted renters living in comparable housing units and neighborhoods, which is estimated to come at an additional cost of \$3.8 million to taxpayers each year in Milwaukee alone (Desmond & Perkins, 2016). To eliminate overcharging within the voucher program, HUD has started testing use of local rent ceilings based on median income at the zip code level instead of the metropolitan level. This proposed revision is likely to limit exploitation of voucher holders and give them incentives to move to better neighborhoods. However, such efforts should

be coupled with enforcement of mandated participation in the voucher program as some landlords refuse to rent their property to voucher holders (Freeman, 2012). In this way, it would be possible to expand the housing options of low-income families, including those headed by teen mothers.

While expansion of housing vouchers is essential, linking the rental assistance programs to other services is equally important. This initiative seems to be especially critical for teen mothers who may have limited knowledge of, or have little experience with, navigating the system. Central to this scheme is to assign case workers to each beneficiary. As conducting a housing search is stressful and voucher holders are given only a brief period to find a place following their admission into the voucher program (Desmond & Perkins, 2016), case workers should offer help families to find an adequate unit matching their specific needs. Assisting families to choose safe, resource rich neighborhoods where they would have greater access to employment, health care and high quality schools should be a priority. Considering the public concern that expanded voucher program would disincentivize employment, case workers should inform beneficiaries about training and employment opportunities, help them with the application process and, once the employment is obtained, regularly check in with their clients to motivate them to fulfill their responsibilities at work. This is the only possible way to promote financial independence of families and help them leave the public assistance programs. Home visiting programs, with their emphasis on increasing support networks of families and connecting them to community resources, may serve as a suitable platform to offer families the kind

of case management services discussed above. I discuss the potential case management strategies that can be implemented by home visitors in the next section.

Another noteworthy finding of the present study is that living with an adult relative/guardian served as a protection against housing instability as indicated by temporary living arrangements. The special provision of TANF that require minors to live in adult supervised settings has been controversial as there are opposing views on this subject. On the one hand, teen mothers may benefit from living in extended households by receiving financial support and assistance with child care tasks. Owing to that support, they may be able continue their education or secure employment (Gordon, Chase-Lansdale & Brooks-Gunn, 2004). On the other hand, reliance on their own mothers or other adult relatives for childcare may reduce teen mothers' parenting competence or may be a source of psychological distress due to conflicts around childrearing issues (Gordon et al., 2004). Moreover, living with the family of origin may not be the safest option for teen mothers and their babies as having a history of victimization or witnessing domestic violence are not uncommon experiences among teen mothers (Kennedy, 2007; TIER 2015).

This study provided support for the beneficial effects of living with an adult relative/guardian, at least in terms of increased housing security. However, this finding should be interpreted with caution as this study assessed the role of this particular living arrangement in relation to a single outcome area, housing. Before making any conclusive statements about the soundness of TANF

provision, additional investigation is required with regards to the family relations, life adversities, psychological adjustment and parenting competence of teen mothers who participated in this study.

Home Visiting Programs and Policy

Research suggests that engaging target families in home visiting programs is a challenging endeavor (Boller et al. 2014; Daro, McCurdy, Nelson, 2005). This study adds to the discussion of engagement in home visiting programs by revealing that housing instability, as manifested by use of temporary living arrangements, is a potential threat to continued participation in home visitation services. Participants who experienced housing instability used the home visiting program least intensively, measured by shorter duration in the program and fewer completed home visits, even though they had higher initial engagement compared to participants who had very few housing problems. In the next section, I present a number of home visiting policy and program recommendations to ensure the continued participation of teen mothers who do not have access to stable housing.

A recommended state-wide home visiting policy alteration involves the catchment-based system. Under the current policy in Massachusetts, participants who move from one catchment area to another are transferred to the program in the new catchment area. Research suggests that this disruption in service and the accompanying change in the home visitor assignment often results in program attrition (Brookes et al., 2006; Fifolt, Lanzi, Johns, Strichik, & Preskitt, 2016). This practice may be especially detrimental for unstably housed teen mothers who may have limited time and emotional resources to establish a relationship with a

new home visitor due to their complex lives. To address this problem, a new policy is called for to allow participants to stay with the same home visitor even after moving to a new catchment area.

Home visitors are in a position to observe the housing difficulties of families firsthand through their regular access to teen mothers' homes. Our previous work on home visitor-participant relationship also suggests that young mothers feel comfortable talking to their service providers about their housing problems (Coskun, 2010). For these reasons, it is important that home visitors are well-equipped to provide guidance on issues related to housing. However, a statewide needs assessment conducted with the aim to investigate the quality and capacity of existing early childhood home visiting programs in Massachusetts indicated substantial gaps in services to homeless families (Massachusetts Executive Office of Health and Human Services [EOHHS], 2010). In a related community survey, housing was identified as the most difficult service area for referrals (EOHHS, n.d.). To address this issue, topics related to housing options, rental assistance programs, tenants' rights and responsibilities and eviction should be incorporated into home visitor training curriculum.

Through this training, home visitors should be able to develop the skills to identify a family's housing challenges and assist them in determining a course of action. This may involve encouraging families to apply for housing assistance and supporting them throughout the process. To this end, home visitors may offer transportation to local housing authorities, help their clients fill out the paperwork and follow up with the application. To facilitate housing search, home visitors

can refer families to websites where local authorities offer a listing of properties available to voucher holders in the private market. If possible, home visitors should accompany families when touring the potential apartments as their presence can be assuring for the landlords and may prevent them discriminating against young, rent assisted families. In addition, home visitors can help families negotiate the rent if they think the rent asked by the landlord is higher than the similar units in the same neighborhood. As part of the case management strategies, home visitors should also guide families to use their vouchers in well-off neighborhoods with more opportunities.

Another programmatic recommendation that follows from these findings is to capitalize on housing satisfaction information collected during intake interviews to identify teen mothers who potentially need enhanced support to stay in the program and take advantage of the home visiting services. Home visitors should be persistent—even more so than usual—to follow up with these participants when they miss a visit. They should inquire the reasons for the missed visit, offer help within their ability when participants expresses a specific concern as the reason for the no-show or cancellation and offer flexible scheduling options for the make-up session. If participants are staying at someone else's place or their house is not convenient for accepting guests, home visitors may offer meeting in public places or making a video call on Skype. The latter approach could be particularly convenient if participants bounce back and forth between places and not exactly know where they will be at the time of the next home visit. Maintaining contact may be difficult when families move

without leaving an address or experience phone service disruptions (Brookes et al., 2006). Therefore, home visitors should look into ways to stay connected with participants. One potential solution is to use social media sites and apps such as Facebook, Instagram and Snapchat as teenagers tend to heavily use these digital platforms. Despite all these efforts, if program engagement is still no longer possible, for example, when participants need to move outside the programs catchment area, home visitors should suggest alternative services and programs that can help participants with their specific needs.

Limitations

Although this dissertation successfully used advanced statistical methods to shed light on the housing circumstances of a relatively understudied group – families headed by teen mothers – it also had several limitations. The major limitation was the nature of the data related to housing available from MHFE-2. This database included a wealth of information on teen mothers and their children, obtained from interviews, standardized measures, and public agency records. However, the evaluation was not originally planned with teen mothers' housing arrangements in mind. For this reason, the dataset included limited housing information. I went through the existing information and identified the interview questions and survey items that would potentially shed light to important dimensions of housing. Despite my best effort, I was not able to include several important housing dimensions—such as housing quality, and home ownership—in this dissertation. Available information on another dimension, homelessness, was somewhat restricted and did not include several

arrangements which were part of the official definition of homelessness such as living on the streets or in an abandoned building or a vehicle. As a result, I had to label this dimension as temporary living instead of homelessness.

In addition, I had to use subjective measures to assess some housing challenges, including overcrowding and affordability, which may be another potential limitation of this study. Subjective measures are not always reliable as they may reflect respondents' perceptions of a condition rather than the condition itself. I believe this may partially explain the low rates of housing affordability problems noted in this study. It was questionable that, in a sample including at-risk women who mostly resided in low-income neighborhoods, only 9% reported lacking adequate resources to meet their housing needs. Adolescence is usually viewed as a period of self-absorption (Elkind, 1967). This preoccupation with oneself may leave little room for teenagers to be attentive to what is happening in their households, including financial difficulties. If teenagers do not have to pay for themselves, they may have limited knowledge about the cost of housing and utilities as well as the availability of resources required to meet those needs. For this reason, study participants' responses reflecting no difficulty with housing affordability may be an indication of their lack of awareness of affordability problems rather than the absence of such problems.

A further limitation here is the examination of housing challenges only cross-sectionally. At the onset of this study, available data on housing conditions were limited to three time points covering the period from program entry to roughly the second birthday of participants' babies. Due to my interest in

understanding the housing circumstances of new mothers, I chose to focus on investigating the housing challenges encountered during the first year of parenthood based on information collected at wave 2. This dissertation provided valuable insight into the housing conditions of teen mothers during their adjustment to parenting. With recently available data collected at waves 4 and 5 as part of the early childhood component of MHFE-2 (i.e. MHFE-2EC), it is now possible to extend this investigation. The preliminary analysis I have recently conducted using the unpublished raw data from MHFE-2EC indicate a sharp increase in residential mobility and a substantial decline in perceived overcrowding and temporary living arrangements over time whereas the rates of perceived affordability problems remain comparable to earlier time points. A longitudinal examination including all five time points would provide a more complete picture of housing needs of young families.

Future Directions

Future research should expand on the current study to delve deeper into housing circumstances of teen mothers. More nuanced, reliable measures should be used to assess various aspects of housing. To tap affordability problems, using a conventional measure inquiring about the rental cost in relation to income would be appropriate. A comprehensive measure of homelessness is needed to capture additional aspects of homelessness which were missing in this study such as living in public spaces and non-conventional dwellings (e.g. mobile homes, tents), or living with family and friends due to a lack of housing. It is also advisable to tease apart the dissatisfaction resulting from housing conditions in and of

themselves from that associated with the household composition. By differentiating between the two, it would be possible to gain a refined understanding of the nature of the housing need.

Future studies should continue to take advantage of person-centered approaches to address multi-faceted nature of housing and identify individual and contextual characteristics that are linked to housing patterns. Notwithstanding, a longitudinal approach should also be incorporated into the research design to examine change in housing patterns within this population. In addition, future studies should identify the factors that mediate or moderate the relationship between housing insecurity and program utilization. The potential variables of interest are the quality of the home visitor-client relationship, the extent of housing guidance provided by the home visitor and/or the program staff and the type and level of social support available to teen mothers.

In conclusion, despite several limitations, this dissertation was one of the few studies investigating housing challenges of teen mothers and probably the first to use a person-centered approach to study housing insecurity in this population. Employing a person-centered approach made it possible to unpack the complex ways in which different housing problems group together to form distinct patterns and how those patterns were related to the utilization of home visitation services. Although housing problems in the study sample were not as common as expected, results clearly showed that most teen mothers were dissatisfied with their housing conditions during the first year after childbirth. Furthermore, this dissertation suggests that lack of stable housing was a barrier to

retaining teen mothers in home visiting programs. Future studies that build upon the work presented here will expand our understanding of the housing needs of young families and how those needs interfere with the use of much needed services. Only then it would be possible to offer services designed to respond to specific needs of insecurely-housed young families.

References

- Adam, E. K. (2004). Beyond quality: Parental and residential stability and children's adjustment. *Current Directions in Psychological Science, 13*, 210–213.
- Adam, E. K., & Chase-Lansdale, P. L. (2002). Home sweet home(s): Parental separations, residential moves, and adjustment problems in low-income adolescent girls. *Developmental Psychology, 38*(5), 792-805.
- Afifi, T. O. (2007). Child abuse and adolescent parenting. *Journal of Aggression, Maltreatment & Trauma, 14*(3), 89-105.
- Agresti, A. (2002). *Categorical data analysis: Wiley series in probability and statistics*. Hoboken, NJ: Wiley.
- Akaike, H. (1987). Factor analysis and AIC. *Psychometrika, 52*, 317-332.
- Altman, I. (1975). *The environment and social behavior*. Monterey, CA: Brooks-Cole.
- American Academy of Pediatrics. Council on Child and Adolescent Health. (1998). The role of home-visitation programs in improving health outcomes for children and families. *Pediatrics, 101*(3), 486–489.
- Andrews, K. M., & Moore, K. A. (2011). *Second chance homes: A resource for teen mothers* (publication no.2011 –14). Washington, DC: Child Trends. Retrieved from: http://www.childtrends.org/wpcontent/uploads/2011/04/child_trends-2011_04_15_rb_2ndchancehomes.pdf.

- Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling, 21*(3), 329-341.
- Atkins, D. C., & Gallop, R. J. (2007). Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology, 21*, 726–735.
- Atkins, D. C., Baldwin, S. A., Zheng, C., Gallop, R. J., Neighbors, C. (2013). A tutorial on count regression and zero-altered count models for longitudinal substance use data. *Psychology of Addictive Behaviors, 27*(1), 166-177.
- Avellar, S., Paulsell, D., Sama-Miller, E., Del Grosso, P., Akers, L., & Kleinman, R. (2016). Home visiting evidence of effectiveness review: Executive summary. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.
- Bailey, K. T., Cook, J. T., Ettinger de Cuba, S., Casey, P. H., Chilton, M., Coleman, S., ... Frank, D. A. (2015). Development of an index of subsidized housing availability and its relationship to housing insecurity, Housing Policy Debate. doi: <http://dx.doi.org/10.1080/10511482.2015.1015042>.
- Baker, M., Zhang, J., & Howden-Chapman, P. (2010). *Health impacts of social housing: Hospitalisations in Housing New Zealand applicants and tenants, 2003-2008*. Wellington: He Kainga Oranga/ Housing and Health Research Programme, University of Otago.

- Baldassare, M. (1979). *Residential crowding in urban United States*. Berkeley, CA: University of California Press.
- Barlow, A., Mullany, B., Neault, N., Compton, S., Carter, A., Hastings, R.,... Walkup, J. T. (2013). Effect of a paraprofessional home-visiting intervention on American Indian teen mothers' and infants' behavioral risks: A randomized controlled trial. *The American Journal of Psychiatry*, *170*(1), 83-93.
- Baron, R. M., & Rodin, J. (1978). Personal control and crowding stress: Processes mediating the impact of spatial and social density. In A. Baum, J. Singer, & S. Valins (Eds.), *Advances in environmental psychology*, Vol. 1 (pp. 145–190). Hillsdale, NJ: Erlbaum.
- Barrow, S. M., & Lawinski, T. (2009). Contexts of mother child separations in homeless families. *Analyses of Social Issues and Public Policy*, *9*, 157–176.
- Bartlett, S. (1998). Does inadequate housing perpetuate children's poverty? *Childhood*, *5*(4), 403-420.
- Bassuk, E. L. (2010). Ending child homelessness in America. *American Journal of Orthopsychiatry*, *80*(4), 496-504.
- Bassuk, E. L., Weinreb, L. F., Buckner, J. C., Browne, A., Salomon, A., & Bassuk, S. S. (1996). The characteristics and needs of sheltered homeless and low-income housed mothers. *Journal of the American Medical Association*, *276*, 640–646.

- Berube, A. (2008). Concentrated Poverty in America: An Overview. In *The enduring challenge of concentrated poverty in America: Case studies from communities across the U.S.* (pp. 3-20). Washington, DC: The Brookings Institution.
- Bilukha, O., Hahn, R. A., Crosby, A., Fulilove, M. T., Liberman, A., Moscicki, ...
Briss, P. A. (2005). The effectiveness of early childhood home visitation in preventing violence: A systematic review. *American Journal of Preventive Medicine*, 28(2 suppl. 1), 11–39.
- Blake, K. S., Kellerson, R. L., & Simic, A. (2007). *Measuring overcrowding in housing*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- Boller, K., Daro, D., Del Grosso, P., Cole, R., Paulsell, D., Hart, B., & Hargreaves, M. (2014). Making replication work: Building infrastructure to implement, scale-up, and sustain evidence-based early childhood home-visiting programs with fidelity. Children’s Bureau, Administration for Children and Families. Washington, DC: US Department of Health and Human Services.
- Boller, K., Strong, D. A., & Daro, D. (2010). Home visiting: Looking back and moving forward. *Zero to Three*, 30(6), 4-9.
- Bratt, R. G., Stone, M. E., & Hartman, C. (2006). *A right to housing: Foundation for a new social agenda*. Philadelphia: Temple University Press.
- Bromfield, L., Sutherland, K., & Parker, R. (2012). *Families with multiple and complex needs: Specialist practice resource*. Melbourne, Australia: Victorian Government Department of Human Services. Retrieved from [http:// www](http://www).

dhs.vic.gov.au/_data/assets/pdf_file/0008/721880/Families-with-multiple-and-complex-needs-specialist-resource.pdf.

- Brookes, S. J., Summers, J. A., Thornburg, K. R., Ispa, J. M., & Lane, V. J. (2006). Building successful home visitor-mother relationship and reaching the goals in two Early Head Start programs: A qualitative look at contributing factors. *Early Childhood Research Quarterly, 21*, 25-45.
- Brown, D., Benzeval, M., Gayle, V., Macintyre, S., O'Reilly, D., & Leyland, A. H. (2012). Childhood residential mobility and health in late adolescence and adulthood: Findings from West of Scotland Twenty-07 Study. *Journal of Epidemiology & Community Health, 66*(10), 942-950.
- Browne, A., & Bassuk, S. S. (1997). Intimate violence in the lives of homeless and poor housed women: Prevalence and patterns. *Journal of Orthopsychiatry, 67*, 261-278.
- Bures, R. M. (2003). Childhood residential stability and health at midlife. *American Journal of Public Health, 93*, 1144–1148.
- Burgard, S. A., Seefeldt, K. S., & Zelner, S. (2012). Housing instability and health: Findings from the Michigan Recession and Recovery Study. *Social Science & Medicine, 75*, 2215–24.
- Busacker, A., & Kasehagen, L. (2012). Association of residential mobility with child health: An analysis of the 2007 National Survey of Children's Health. *Maternal and Child Health Journal, 16*, 578-587.

- Butchart, A., Harvey, A. P., Mian, M., Furniss, T. (2006). *Preventing child maltreatment: A guide to taking action and generating evidence*. Geneva, Switzerland: World Health Organization.
- Carbone, S., Fraser, A., Ramburuth, R. & Nelms, L. (2004). *Breaking Cycles, Building Futures. Promoting inclusion of vulnerable families in antenatal and universal early childhood services: A report on the first three stages of the project*. Melbourne, Victoria: Victorian Department of Human Services.
Retrieved from https://www.eduweb.vic.gov.au/edulibrary/public/beststart/ecs_breaking_cycles_best_start.pdf.
- Casares, W. N., Lahiff, M., Eskenazi, B., & Halpern-Felsher, B. L. (2010). Unpredicted trajectories: The relationship between race/ethnicity, pregnancy during adolescence and young women's outcomes. *Journal of Adolescent Health, 47*, 143–150.
- Center on Budget and Policy Priorities. (2015). *Policy basics: An introduction to TANF*. Retrieved from <http://www.cbpp.org/sites/default/files/atoms/files/7-22-10tanf2.pdf>.
- Chapman, S. L. C., & Wu, L. T. (2013). Substance use among adolescent mothers: A review. *Children and Youth Services Review, 35*(5), 806–815.
- Clark, S. L. (2010). *Housing instability: Toward a better understanding of frequent residential mobility among America's urban poor*. Retrieved from http://www.centerforhousingpolicy.org/media/files/LawsonClark_analysis_for_child_mobility.pdf.

- Cohen, S. (1978). Environmental load and the allocation of attention. In A. Baum, J. E. Singer, & S. Valins (Eds.), *Advances in environmental psychology* (Vol. 1). Hillsdale, N.J.: Erlbaum, 1978.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: Lawrence Erlbaum.
- Cohen, R., & Wardrip, K. (2011). *Should I stay or should i go? Exploring the effects of housing instability and mobility on children*. Washington, DC: Center for Housing Policy National Housing Conference.
- Coley, R. L., Kull, M., Levanthal, T., & Lynch, A.D. (2014). Profiles of housing and neighborhood contexts among low-income families: Links with children's well-being. *Cityscape: A Journal of Policy Development and Research*, 16, 41-64.
- Coley, R. L., Leventhal, T., Lynch, A. D., & Kull, M. (2013). Relations between housing characteristics and the well-being of low-income children and adolescents. *Developmental Psychology*, 49(9), 1775-1789.
- Collins, L. M., & Lanza, S. T. (2010). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences*. New York: Wiley.
- Collins, M. E., Stevens, J. W., & Lane, T. S. (2000). Teenage parents and welfare reform: Findings from a survey of teenagers affected by living requirements. *Social Work*, 45(4), 327-338.
- Congressional Budget Office. (2015). *Federal housing assistance for low-income households*(Report no. 50782). Congressional Budget Office.

- Conley D. (2001). A room with a view or a room of one's own? Housing and social stratification. *Sociological Forum*, 16(2), 63–80.
- Cooke, J. & Owen J. (2007). A place of our own? Teenage mothers views on housing needs and support models. *Children & Society*, 21, 2007, 56-68.
- Cooper, E., F. (2006). *Second Chance Homes: Federal funding, programs, and services*(Report No.31450). Washington, DC: Congressional Research Service. Retrieved from <http://congressionalresearch.com/RL31540/document.php>.
- Coskun, L. (2010). *HFM home visit content analyses*. Unpublished manuscript.
- Coulton, C., Theodos, B., & Turner, M. (2009). *Family mobility and neighborhood change: New evidence and implications for community initiatives*. Washington, DC: The Urban Institute.
- Coyne, C.A. & D'Onofrio, B.M. (2012). Some (but not much) progress toward understanding teenage childbearing: A review of research in the past 10 years. *Advances in Child Development and Behavior*, 42, 113-152.
- Crowder, K., & Teachman, J. (2004). Do residential conditions explain the relationship between living arrangements and adolescent behavior? *Journal of Marriage and Family*, 66(3), 721-738.
- Crowley, S. (2003). The affordable housing crisis: Residential mobility of poor families and school mobility of poor children. *Journal of Negro Education*, 72(1): 22–38.
- Currie, J. M. (2008). *The invisible safety net: Protecting the nation's poor children and families*. Princeton, NJ: Princeton University Press.

- Curtis, M. A. (2007). Subsidized housing, housing prices, and the living arrangements of unmarried mothers. *Housing Policy Debate, 18*, 145–170.
- Curtis, M. A. (2011). The impact of housing subsidies and prices on mothers' living arrangements: Evidence from the census. *Housing Studies, 26*, 747–765.
- Curtis, M. A., Corman, H., Noonan, K., & Reichman, N. E. (2013). Life shocks and homelessness. *Demography, 50*, 2227–2253.
- Cutts, D. B., Meyers, A. F., Black, M. M., Casey, P. H., Chilton, M., Cook, J. T., . . . Frank, D. A. (2011). U.S. housing insecurity and the health of very young children. *American Journal of Public Health, 101*, 1508–1514. doi:10.2105/AJPH.2011.300139.
- Damashek, A., Doughty, D., Ware, L., & Silovsky, J. (2011). Predictors of client engagement and attrition in home-based child maltreatment prevention services. *Child Maltreatment, 16*(1), 9-20.
- Daro, D., McCurdy, K., Falconnier, L., & Stojanovic, D. (2003). Sustaining new parents in home visitation services: Key participant and program factors. *Child Abuse & Neglect, 27*, 1101-1125.
- Daro, D., McCurdy, K., & Nelson, C. (2005). Engagement and retention in voluntary new parent support programs: Final report Chicago, Chapin Hall Center for Children, University of Chicago.
- Davey-Rothwell, M. A., German, D., & Latkin, C. A. (2008). Residential transience and depression: Does the relationship exist for men and

women? *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 85(5), 707-716.

- David, D. H., Gelberg, L., & Suchman, N. E. (2012). Implications of Homelessness for Parenting Young Children: A preliminary review from a developmental attachment perspective. *Infant Mental Health Journal*, 33(1), 1-9.
- Desmond, M. (2016). *Evicted: Poverty and profit in the American city*. New York: Crown.
- Desmond, M., & Perkins, K. L. (2016). Are landlord overcharging housing voucher holders? *City and Community*, 15(2), 137-162.
- Desor, J. (1972). Towards a psychological theory of crowding. *Journal of Personality and Social Psychology*, 11, 93-97.
- DeWit, D. J. (1998). Frequent childhood geographic relocation: Its impact on drug use initiation and the development of alcohol and other drug-related problems among adolescents and young adults. *Addictive Behaviors*, 23(5), 623-634.
- Dong, M., Anda, R. F., Felitti, V. J., Williamson, D. F., Dube, S. R., Brown D. W., ... Giles, W. H. (2005). Childhood residential mobility and multiple health risks during adolescence and adulthood: The hidden role of adverse childhood experiences. *Archives of Pediatrics and Adolescent Medicine*, 159(12), 1104-1110.
- Duggan, A., Windham, A., McFarlane, E., Fuddy, L., Rohde, C., Buchbinder, S., & Sia, C. (2000). Hawaii's healthy start program of home visiting for at-

risk families: Evaluation of family identification, family engagement, and service delivery. *Pediatrics*, *105*, 250-259.

- Dumas, J. E., Nissley-Tsiopinis, J., & Moreland, A. D. (2007). From intent to enrollment, attendance, and participation in preventive parenting groups. *Journal of Child and Family Studies*, *16*(1), 1-26.
- Dunst, C. J., & Leet, H. E. (1987). Measuring the adequacy of resources in households with young children. *Child: Care, Health and Development*, *13*, 111-125.
- Durham, K. (2003). *Housing youth: Key issues in supportive housing*. New York: Corporation for Supportive Housing.
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, *41*(3-4), 327-350.
- Easterbrooks, M. A., Chaudhuri, J. H., Bartlett, J. D., & Copeman, A. (2011). Resilience in parenting among young mothers: Family and ecological risks and opportunities. *Children and Youth Services Review*, *33*, 42-50.
- Elkind, D. (1967). Egocentrism in adolescence. *Child Development*, *38*, 1025-1034.
- Elliott, M. C., Shuey, E. A., Zaika, N., Mims, L., & Leventhal, T. (2016). *Finding home: A qualitative approach to understanding adolescent mothers' housing instability*. Unpublished manuscript.

- Emerson, J., & Lovitt, T. (2003). The educational plight of foster children in schools and what can be done about it. *Remedial Special Education, 24*(4), 199-203.
- Eshbaugh, E. M. (2008). Potential positive and negative consequences of coresidence for teen mothers and their children in adult-supervised households. *Journal of Child and Family Studies, 17*(1), 98-108.
- Esser, A. (1972). A biosocial perspective on crowding. In J. Wohlwill, & D. Carson (Eds.), *Environment and the social sciences: Perspectives and applications*. Washington, DC: American Psychological Association.
- Evans, G. W. (2006). Child development and the physical environment. *Annual Review of Psychology, 57*, 423-451.
- Evans, G. W., Lepore, S. J., Shejwal, B. R., & Palsane, M. N. (1998). Chronic residential crowding and children's well-being: An ecological perspective. *Child Development, 69*(6), 1514-1523.
- Evans, G. W., Lercher, P., & Kofler, W. W. (2002). Crowding and children's mental health: The role of house type. *Journal of Environmental Psychology, 22*(3), 221-231.
- Evans, G. W., Maxwell, L. M., & Hart, B. (1999). Parental language and verbal responsiveness to children in crowded homes. *Developmental Psychology, 35*, 1020-1023.
- Evans, G. W., Palsane, M. N., Lepore, S. J., & Martin, J. (1989). Residential density and psychological health: The mediating effects of social support. *Journal of Personality and Social Psychology, 57*, 994-999.

- Evans, G. W., Ricciuti, H. N., Hope, S., Schoon, I., Bradley, R. H., Corwyn, R. F., et al. (2010). Crowding and cognitive development. The mediating role of maternal responsiveness among 36-month-old children. *Environment and Behavior, 42*(1), 135-148.
- Evans, G. W., Saegert, S., & Harris, R. (2001). Residential density and health among children in low income families. *Environment and Behavior, 33*, 165-180.
- Federal Interagency Forum on Child and Family Statistics (2015). *America's children: Key national indicators of well-being*. Washington, DC: U.S. Government Printing Office.
- Fifolt, M., Lanzi, R., Johns, E., Strichik, T., & Preskitt, J. (2016). Attrition in a home visiting program: Looking back and moving forward. *Early Child Development and Care, 1*-13.
- Fletcher, J. M., & Wolfe, B. L. (2009). Education and labor market consequences of teenage childbearing: Evidence using the timing of pregnancy outcomes and community fixed effects. *The Journal of Human Resources, 44*(2), 303-325.
- Freeman, L. (2012). The impact of source of income laws on voucher utilization. *Housing Policy Debate, 2*, 297-318.
- Garvey, C., Julion, W., Fogg, L., Kratovil, A., & Gross, D. (2006). Measuring participation in a prevention trial with parents of young children. *Research in Nursing and Health, 29*(3), 212-222.

- Gilfeather, L. (2005). Teen Living Programs in Massachusetts. *Elements, 1*(1), 44-54.
- Geiser, C. (2013). *Data analysis with Mplus*. New York: Guilford Press.
- Glass, D. C., & Singer, J. E. (1972). *Urban stress: Experiment on noise and social stressors*. New York: Academic Press.
- Gilman, S. E., Kawachi, I., Fitzmaurice, G. M., & Buka, S. L. (2003). Socioeconomic status, family disruption and residential stability in childhood: relation to onset, recurrence and remission of major depression. *Psychological Medicine, 33*, 1341-1355.
- Gomby, D., Culross, P., & Behrman, R. (1999). Home visiting: Recent program evaluations—Analysis and recommendations. *The Future of Children, 9*, 4–26.
- Goldberg, J., Bumgarner, E., & Jacobs, F. (2016). Measuring program- and individual-level fidelity in a home visiting program for adolescent parents. *Evaluation and Program Planning, 55*, 163-173.
- Gordon, R., Chase-Lansdale, P. L., & Brooks-Gunn, J. (2004). Extended households and the life course of young mothers: Understanding the associations using a sample of mothers with premature, low birth weight babies. *Child Development, 75*(4): 1013–38.
- Goux, D., & Maurin, E. (2005). The effect of overcrowded housing on children's performance at school. *Journal of Public Economics, 89*, 797-819.

- Gove, W. R., Hughes, M., & Galle, O. R. (1979). Overcrowding in the home: An empirical investigation of its possible pathological consequences. *American Sociological Review*, 44(1), 59-80.
- Grant, R., Shapiro, A., Joseph, S., Goldsmith, S., Rigual-Lynch, L., & Redlener, I. (2007). The health of homeless children revisited. *Advances in Pediatrics*, 54, 173-187.
- Guarino, K., & Bassuk, E. (2010). Working with families experiencing homelessness. *Journal of Zero To Three: National Center for Infants, Toddlers, and Families*, 30(3), 11–20.
- Hamilton, B. E., Martin, J. A., & Ventura, S. J. (2011). Births: *Preliminary data for 2010* (Report no. 60(2)). Hyattsville, MD: National Center for Health Statistics. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_02.pdf.
- Hamilton, B. E., Martin, J. A., Osterman, M. J. K., & Curtin, S. C. (2015). Births: *Final Data for 2014*. Hyattsville, MD: National Center for Health Statistics. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_12.pdf.
- Harkness, J., & Newman, S. J. (2005). Housing affordability and children's well-being: Evidence from the national survey of America's families. *Housing Policy Debate*, 16(2), 223-255.
- Harkness, J., Newman, S. J., & Holupka, C. (2009). Geographic differences in housing prices and the well-being of children and parents. *Journal of Urban Affairs*, 31(2), 123-146.

- Hart, B. & Risley, T.R (2003). The early catastrophe: The 30 million word gap by age 3. *American Educator*, 27(1), 4-9.
- Haynie, D. L., South, S.J., & Bose, S. (2006). Residential mobility and attempted suicide among adolescents: An individual-level analysis. *The Sociological Quarterly*, 47, 693-721.
- Hoffman, S. D. & Maynard, R. (Eds). (2008). *Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy*. Washington, D.C.: Urban Institute Press.
- Holland, M. L., Xia, Y., Kitzman, H. J., Dozier, A. M., & Olds, D. L. (2014). Patterns of visit attendance in the Nurse–Family Partnership program. *American Journal of Public Health*, 104(10), e58–e65.
- Holupka, C. S., & Newman, S. J. (2011). The housing and neighborhood conditions of America's children: Patterns and trends over four decades. *Housing Policy Debate*, 21(2), 215-245.
- Howard, K.S., & Brooks-Gunn, J. (2009). The role of home-visiting programs in preventing child abuse and neglect. *Future of Children*, 19(2), 119-146.
- Hulsey, L. (2004). *Maternity group homes: Classification and literature review: Final report*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services. Retrieved from <http://aspe.hhs.gov/hsp/grouphomes04/litreview04/report.pdf>.
- Hummel, L., & Levin-Epstein, J. (2005). *A needed transition: Lessons for Illinois about teen parent TANF rules*. Washington, DC: Center for Law and

Social Policy. Retrieved from <http://www.clasp.org/resources-and-publications/files/0230.pdf>.

Ingoldsby, E. M., Baca, P., McClatchey, M. W., Luckey, D. W., Ramsey, M. O., Loch, J. M., & Smith, B. J. (2013). Quasi-experimental pilot study of intervention to increase participant retention and completed home visits in the nurse–family partnership. *Prevention Science, 14*(6), 525–534.

Jacobs, F., Easterbrooks, M.A., Brady, A.E., & Mistry, J. (2005). *Healthy Families Massachusetts Final Evaluation Report*. Medford, MA: Tufts University.

Jacobs, F., Easterbrooks, M. A., Goldberg, J., Mistry, J., Bumgarner, E., Raskin, M.,... Fauth, R. (2016). Helping young families: Randomized controlled trial of a home visiting program to improve adolescent parenting. *American Journal of Public Health, 106*(2), 342-349.

Jacobs, F., Fauth, R. C., Greenstone, J., Coskun, L., Mistry, J., Goldberg, J., & Scott, J. C. (2015). *Understanding the living arrangements of young mothers*. Unpublished manuscript.

Jelleyman, T., & Spencer, N. (2008). Residential mobility in childhood: A systematic review. *Journal of Epidemiological Community Health, 62*(7), 584-592.

Johnson, A., & Meckstroth, A. (1998). Housing insecurity. In *Ancillary services to support welfare to work*. Washington, DC: Mathematica Policy Research. Retrieved from <http://aspe.hhs.gov/hsp/isp/ancillary/housing.htm>.

- Joint Center for Housing Studies of Harvard University. (2015). *The State of the Nation's Housing 2015*. Cambridge, MA: Author.
- Joyce, K.M., Breen, A., Ettinger de Cuba, S., Cook, J.T., Barrett, K.W., Paik, G., Rishi, N., Pullen, B., Schiffmiller, A., and Frank, D.A. (2012). Household hardships, public programs, and their associations with the health and development of very young children: Insights from Children's HealthWatch. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, 3(1), Article 4.
- Juon, H. S., Ensminger, M. E., & Feehan, M. (2003). Childhood adversity and later mortality in an urban African-American cohort. *American Journal of Public Health*, 93, 2044–2046.
- Jutte, D. P., Roos, N. P., Brownell, M., Briggs, G., MacWilliam, L., Roos, L. (2010). The ripples of adolescent motherhood: Social, educational, and medical outcomes for children of teen and prior teen moms. *Academic Pediatrics*, 10(5), 293-301.
- Kahn, J., & Moore, K. A. (2010). What works for home visiting programs: Lessons from experimental evaluations of programs and interventions. Retrieved from <http://www.childtrends.org/wp-content/uploads/2005/07/2010-17WWHomeVisit.pdf>.
- Kennedy, A. C. (2005). Resilience among urban adolescent mothers living with violence. *Journal of Interpersonal Violence*, 21(6), 750-773.

- Kennedy, A. C. (2007). Homelessness, violence exposure, and school participation among urban adolescent mothers. *Journal of Community Psychology, 35*(5), 639-654.
- Kennedy, A. C., Agbényiga, D. B. L. F., Kasiborski, N., Gladden, J. (2010). Risk chains over the life course among homeless urban adolescent mothers: Altering their trajectories through formal support. *Children and Youth Services Review, 32* (12), 1740-1749.
- Kerbow, D. (1996). Patterns of urban student mobility and local school reform. *Journal of Education for Students Placed at Risk, 1*(2), 147-169.
- Kirby, D., & Lepore, G. (2007). *Sexual risk and protective factors: Factors affecting teen sexual behavior, pregnancy, childbearing and sexually transmitted disease*. Washington, DC: ETR Associates and The National Campaign to Prevent Teen and Unplanned Pregnancy. Retrieved from https://thenationalcampaign.org/sites/default/files/resource-primary-download/protective_factors_full.pdf.
- Kirkpatrick, S., & Tarasuk, V. (2011). Housing circumstances are associated with household food access among low-income urban families. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 88*(2), 284-296.
- Klerman, L., V. (2004). *Another chance: Preventing additional births to teen mothers*. Washington, DC: National Campaign to Prevent Teen Pregnancy.

- Kolbe, L. J., Kann, L., & Collins, J. L. (1993). Overview of the Youth Risk Behavior Surveillance System. *Public Health Reports, 108*(1), 2–10.
- Korfmacher, J., Green, B., Staerkel, F., Peterson, C., Cook, G., Roggman, L., . . . Schiffman, R. (2008). Parent involvement in early childhood home visiting. *Child Youth Care Forum, 37*, 171-196.
- Krieger, J., & Higgins, D. L. (2002). Housing and health: Time again for public health action. *American Journal of Public Health, 92*(5), 758–768.
- Krugman, R. D. (1993). Universal home visiting: A recommendation from the US Advisory Board on Child Abuse and Neglect. *Future of Children, 3*(3), 184–191.
- Kushel, M. B., Gupta, R., Gee, L., & Haas, J. S. (2006). Housing instability and food insecurity as barriers to health care among low-income Americans. *Journal of General Internal Medicine, 21*, 71–77. doi:10.1111/j.1525-1497.2005.00278.x
- Lanza, S. T., & Cooper, B. R. (2016). Latent class analysis for developmental research. *Child Development Perspectives, 10*(1), 59-64.
- Lee, D. (2010). The early socioeconomic effects of teenage childbearing: A propensity score matching approach. *Demographic Research, 23*, 697-736.
- Lee, W., Beecroft, E., Khadduri, J., & Patterson, R. (2003). *Impacts of welfare reform on housing assistance recipients: Evidence from Indiana and Delaware*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Retrieved

from http://www.huduser.org/Publications/PDF/impacts_of_welfare_reform.pdf.

- Lepore, S. J., Evans, G. W., & Palsane, M. N. (1991). Social hassles and psychological health in the context of crowding. *Journal of Health and Social Behavior, 32*, 357-367.
- Lepore, S. J., Evans, G. W., & Palsane, M. N. (1991). Social hassles and psychological health in the context of crowding. *Journal of Health and Social Behavior, 32*, 357-367.
- Leventhal, T., & Newman, S. (2010). Housing and child development. *Children and Youth Services Review, 32*(9), 1165-1174.
- Levin-Epstein, J. & Schwartz, A. (2005). Improving TANF for teens. *Journal of Poverty Law and Policy, 39*, 183-194. Retrieved from http://www.ncdsv.org/images/Shriver_Improving-TANF-for-Teens_JulAug_2005.pdf.
- Liddell, C., & Kruger, P. (1989). Activity and social behavior in a crowded South African township nursery: A follow-up study on the effects of crowding at home. *Merrill-Palmer Quarterly, 35*, 209-226.
- Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*, 767-778.
- Loo, C., & Ong, P. (1984). Crowding perceptions, attitudes, and consequences among the Chinese. *Environment and Behavior, 16*(1), 55-87.
- Ma, C. T., Gee, L., & Kushel, M. B. (2008). Associations between housing instability and food insecurity with health care access in low-income children. *Ambulatory Pediatrics, 8*(1), 50-57.

- March, E. L., Ettinger de Cuba, S., Cook, J. T., Bailey, K., Cutt, D. B., Meyers, A. F., & Frank, D. A. (2011). *Behind closed doors: The hidden health impacts of being behind on rent*. Retrieved from http://www.childrenshealthwatch.org/upload/resource/behindcloseddoors_report_jan11.pdf.
- Martin, J. A., Hamilton, B. E., Ventura, S. J., Osterman, M. J. K., Curtin, S.C., & Mathews, T. J. (2013). *Births: Final data for 2012*. National Vital Statistics Reports, vol 62 no 9. Hyattsville, MD: National Center for Health Statistics. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_09.pdf.
- Massachusetts Executive Office of Health and Human Services (2010). *Massachusetts Evidence-Based Home Visiting Program: Needs Assessment Narrative*. Retrieved from <http://www.mass.gov/eohhs/docs/dph/com-health/homevisiting/2010-hv-na-sec-6.pdf>.
- Massachusetts Executive Office of Health and Human Services (n.d.). *Maternal, Infant and Early Childhood Community Survey: Statetwide Highlights*. Retrieved from <http://www.mass.gov/eohhs/gov/departments/dph/programs/family-health/home-visiting/home-visiting-initiative-state-and-community-data.html>.
- Maternal, Infant, and Early Childhood Home Visiting. (n.d.). Retrieved from <https://mchb.hrsa.gov/maternal-child-health-initiatives/home-visiting-overview>.

- Masyn, K. (2013). Latent class analysis and finite mixture modeling. In T. Little (Ed.), *Oxford handbook of quantitative methods* (Vol.2, pp. 551-611). New York, NY: Oxford University Press.
- Maxwell, L. (1996). Multiple effects of home and day care crowding. *Environmental Behavior*, 28, 494-511.
- McCarthy, D. P. , & Saegert, S. (1979). Residential density, social overload, and social withdrawal. In J. R. Aiello & A. Baum (Eds.), *Residential crowding and design* (pp. 55-77). New York: Plenum
- McCoy, D. C., & Raver, C. C. (2014). Household instability and self-regulation among poor children. *Journal of Children and Poverty*, 20(2), 131-152.
- McCurdy, K. & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations*, 50(2), 113-121.
- McCurdy, K., Daro, D., Anisfeld, E., Katzev, A., Keim, A., LeCroy, C., . . . Winje, C. (2006). Understanding maternal intentions to engage in home visiting programs. *Children and Youth Services*, 28, 1195-1212.
- Meade, C. S., Kershaw, T.S., & Ickovics, J.R. (2008). The intergenerational cycle of teenage motherhood: An ecological approach. *Health Psychology*, 27(4), 419-29.
- Mersky, J. P., & Reynolds, A. J. (2007). Predictors of early childbearing: Evidence from the Chicago longitudinal study. *Children and Youth Services Review*, 29, 35–52.
- Meyers, A., Cutts, D., Frank, D. A., Levenson, S., Skalicky, A., Heeren, T., . . . , Zaldivar, N. (2005). Subsidized housing and children's nutritional status:

- Data from a multisite surveillance study. *The Archives of Pediatrics and Adolescent Medicine*, 159(6), 551-556.
- Meyers, A., Frank, D. A., Roos N, Peterson, K. E., Casey, V. A., Cupples, L. A., & Levenson, S. M. (1995). Housing subsidies and pediatric undernutrition. *The Archives of Pediatrics and Adolescent Medicine*, 149(10), 1079-1084.
- Mills, G., Gubits, D., Orr, L., Long, D., Feins, J., & Kaul, B. (2006). *Effects of housing vouchers on welfare families*. Washington, DC: U.S. Department of Housing and Urban Development.
- Mistry, J., Easterbrooks, M.A., Fauth, R.C., Raskin, M., Jacobs, F., & Goldberg, J. (2016). Heterogeneity among adolescent parents and home visiting program outcomes. *Children and Youth Services Review*, 65, 86-93.
- Mollborn, S. (2007). Making the best of a bad situation: Material resources and teenage parenthood. *Journal of Marriage and Family*, 69(1), 92-104.
- Murray, M. S. (1997). Low-income renter housing: Another view of the tough choice. *Journal of Housing Research*, 8(1): 27–52.
- Muthén, B. O., & Muthén, L. K. (1998-2015). *Mplus User's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- The National Center on Family Homelessness. (2009). *America's youngest outcasts: State report card on child homelessness*. Newton, MA: National Center of Family Homelessness.
- The National Center on Family Homelessness. (2014). *America's youngest outcasts: A report card on child homelessness*. Waltham, MA: The National Center on Family Homelessness at American Institutes for

- Research. Retrieved from <http://www.homelesschildrenamerica.org/mediadocs/282.pdf>.
- National Low Income Housing Coalition. (2015). *Out of reach* 2015. Retrieved from http://nlihc.org/sites/default/files/oor/OOR_2015_FULL.pdf.
- Newman, S., & Holupka, S. (2014). Housing affordability and investment in children. *Journal of Housing Economics*, 24, 89-100 .
- Newman, S. J., & Holupka, C. S. (2015). Housing affordability and child well-being. *Housing Policy Debate*, 25(1), 116-151.
- Ng, A. S., & Kaye, K. (2012). *Why It Matters: Teen Childbearing, Education, and Economic Wellbeing*. Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy.
- Nievar, M. A., Van Egeren, L. A., & Pollard, S. E. (2010). A meta-analysis of home visiting: Moderators of improvements in maternal behavior. *Infant Mental Health Journal*, 31, 499-520.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, 14, 535–569.
- Oberlander, S. E., Shebl, F. M., Magder, L. S., & Black, M. M. (2009). Adolescent mothers leaving multigenerational households. *Journal of Clinical Child and Adolescent Psychology*, 38(1), 62–74.
- O'Brien, R. A., Moritz, P., Luckey, D. W., McClatchey, M. W., Ingoldsby, E. M., Olds, D. L. (2012). Mixed methods analysis of participant attrition in the Nurse-Family Partnership. *Prevention Science*, (13), 219–228.

- Office of the Deputy Prime Minister. (2004). *The impact of overcrowding on health and education: A review of the evidence and literature*. London. Retrieved from <http://dera.ioe.ac.uk/5073/1/138631.pdf>.
- Oishi, S., & Schimmack, U. (2010). Residential mobility, well-being, and mortality. *Journal of Personality and Social Psychology*, 98(6), 980-994.
- Olsen, E. O. (2003). Housing programs for low-income households. In Robert Moffitt (Ed.), *Means-tested transfer programs in the United States* (pp. 365–442). Chicago, IL: University of Chicago Press.
- O'Rourke, K., Goodman, K. J., Grazioplene, M., Redlinger, T., & Day, R. S. (2003). Determinants of geographic variation in helicobacter pylori infection among children on the US-Mexico border. *American Journal of Epidemiology*, 158(8), 816-824.
- Owens, C., & Tegeler, P. (2007). *Housing cost burden as a civil rights issue: Revisiting the 2005 american community survey data*. Washington, DC: Poverty & Race Research Action Council.
- Oxford, M., Gillchrist, L., Lohr, M., Gillmore, M., Morrison, D., Spieker, S. (2005). Life course heterogeneity in the transition from adolescence to adulthood among adolescent mothers. *Journal of Research on Adolescence*, 15(4), 479-504.
- Paulsell, D., Del Grosso, P., & Supplee, L. (2014). Supporting replication and scale-up of evidence-based home visiting programs: Assessing the implementation knowledge base. *American Journal of Public Health*, 104(9), 1624-1632.

- Pearson, C.L., Locke, G., Montgomery, A.E., & Buron, L. (2007). *The applicability of Housing First Models to homeless persons with serious mental illness*. Prepared for the Department of Housing & Urban Development. Retrieved from <http://www.huduser.org/publications/homeless/hsgfirst.html>.
- Perper, K., Peterson, K., Manlove, J. (2010). *Diploma attainment among teen mothers*. Retrieved from http://www.childtrends.org/Files/ChildTrends2010_01_22_FS_DiplomaAttainment.pdf.
- Pettit, B., & McLanahan, S. (2003). Residential mobility and children's social capital: Evidence from an experiment. *Social Science Quarterly*, 84, 632-649.
- Phibbs, P., & Young, P. (2004). *Housing assistance and non-shelter outcomes: Final report no 74*. Melbourne, Australia: Australian Housing and Urban Research Institute.
- Pollack, C. E., Griffin, B. A., & Lynch, J. (2009). Housing affordability and health among homeowners and renters. *American Journal of Preventive Medicine*, 39(6), 607–608.
- Pribesh, S., & Downey, D. B. (1999). Why are residential and school moves associated with poor school performance? *Demography*, 36(4), 521–534.
- The Public and Affordable Housing Research Corporation. (2016). *Housing is a foundation*. Retrieved from https://www.housingcenter.com/sites/default/files/FINAL_NB_2016%20PAHRC%20Report.pdf.

- Putnam-Hornstein, E., Cederbaum, J. A., King, B., Cleveland, J., & Needell, B. (2013). A population-based examination of maltreatment history among adolescent mothers in California. *Journal of Adolescent Health, 53*(6), 794-797.
- Raby K. L., Roisman, G.I., Fraley, R.C., & Simpson, J. A. (2015). The enduring predictive significance of early maternal sensitivity: Social and academic competence through age 32 years. *Child Development, 86*(3), 695-708.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.
- Raikes, H., Green, B. L., Atwater, J., Kisker, E., Constantine, J., & Chazan-Cohen, R. (2006). Involvement in early head start home visiting services: Demographic predictors and relations to child and parent outcomes. *Early Childhood Research Quarterly, 21*, 2-24.
- Reid, V., & Meadows-Oliver, M. (2007). Postpartum depression in adolescent mothers: An integrative review of the literature. *Journal of Pediatric Health Care, 21*(5), 289-298.
- Rog, D. J., & Buckner, J. C. (2007). Homeless families and children. Paper presented at the 2007 National Symposium on Homelessness Research, Washington, DC. Retrieved from <http://aspe.hhs.gov/hsp/homelessness/symposium07/rog/index.htm>.

- Roggman, L. A., Cook, G. A., Peterson, C., & Raikes, H. (2008). Who drops out of Early Head Start home visiting programs? *Early Education and Development, 19*(4), 574-599.
- Roost, F. D., Jones, N. M., Allan, M., & Dommers, E. (2014). *Recruiting and retaining families in HIPPY: Final report*. Retrieved from http://library.bsl.org.au/jspui/bitstream/1/6141/1/DialloRoost_et_al_Recruiting_and_retaining_families_in_HIPPY_2014.pdf.
- Roy, A. L., McCoy, D.C., & Raver, C. C. (2014). Instability vs. quality: Residential mobility, neighborhood poverty, and children's self-regulation. *Developmental Psychology, 50*(7), 1891–1896.
- Saadeh, F. B., Clark, M. A., Rogers, M. L., Linkletter, C. D., Phipps, M. G., Padbury, J. F., & Vivier, P. M. (2013). Pregnant and moving: Understanding residential mobility during pregnancy and in the first year of life using a prospective birth cohort. *Maternal and Child Health Journal, 17*, 330–343.
- Saegert, S., Mackintosh, E., & West, S. (1975). Two studies of crowding in urban public spaces. *Environment and Behavior, 7*, 159-184.
- Samuels, J., Klein, N. S., Shinn, M., & Buckner, J. C. (2010). Homeless children: Update on research, policy, programs and opportunities. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. Retrieved from <https://aspe.hhs.gov/report/homeless-children-update-research-policy-programs-and-opportunities>.

- Sandel, M., Cutts, D. B., Meyers, A. F., Ettinger de Cuba, S., Coleman, S., Black, M. M., . . . Frank, D. A. (2014). Co-enrollment for child health: How receipt and loss of food and housing subsidies relate to housing security and statutes for streamlined, multi-subsidy applications. *Journal of Applied Research on Children, 5*(2), Article 2.
- Schafer J. L. & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*(2), 147–177.
- Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics, 6*, 461–464.
- Sclove, L. (1987). Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika, 52*, 333–343.
- Sherrod, D. R. Crowding, perceived control, and behavioral aftereffects (1974). *Journal of Applied Social Psychology, 4*, 171-186.
- Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *Journal of the American Medical Association, 301*, 2252-2259.
- Shonkoff, J.P. & Phillips, D.A. (2000). From neurons to neighborhoods: The science of early childhood development. Washington, D.C.: National Academy Press.
- Simpson, G. A., & Fowler, M. G. (1994). Geographic mobility and children's emotional/behavioral adjustment and school functioning. *Pediatrics, 93*(2), 303-309.

- Solari, C., & Mare, R. (2012). Housing crowding effects on children's wellbeing. *Social Science Research, 41*(2), 464-476.
- South, S. J., & Crowder, K. (2010). Neighborhood poverty and nonmarital fertility: Spatial and temporal dimensions. *Journal of Marriage and Family, 72*, 89-104.
- South, S. J., Haynie, D. L., & Bose, S. (2005) Residential mobility and the onset of adolescent sexual activity. *Journal of Marriage and Family, 67*, 499-514.
- South, S. J., Haynie, D. L., & Bose, S. (2007). Student mobility and school dropout. *Social Science Research, 36*, 68-94.
- Stack, S. (1994). The effect of geographic mobility on premarital sex. *Journal of Marriage & the Family, 56*(1), 204-208.
- Suglia, S. F., Duarte, C. S., & Sandel, M. T. (2011). Housing quality, housing instability and maternal mental health. *Journal of Urban Health, 8*(6), 1105-1116.
- Supplee, L., Harwood, R., Margie, N., Meyer, A. (2013). New opportunities and directions in research and evaluation on home visiting. *Zero to Three, 33*(3), 45-50.
- Sweet, M., & Appelbaum, M. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development, 75*(5), 1435-1456.
- Teen parents: Your rights under welfare reform. (n.d.). Retrieved from <http://www.masslegalhelp.org/income-benefits/teen-parents>

- Tobin, K., & Murphy, J. (2013). Addressing the challenges of child and family homelessness. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, 4(1), Article 9, 1–29. doi:10.1542/peds.2011-2663.
- Tufts Interdisciplinary Evaluation Research. (2015). *The Massachusetts Healthy Families Evaluation-2 (MHFE-2): A Randomized Controlled Trial of a Statewide Home Visiting Program for Young Parents. Final report to the Children's Trust of Massachusetts*. Medford, MA: Tufts University.
- U.S. Department of Health and Human Services. Administration for Children and Families. (2015). *Characteristics and financial circumstances of TANF recipients: Fiscal year 2014*. Retrieved from http://www.acf.hhs.gov/sites/default/files/ofa/tanf_characteristics_fy2014.pdf.
- U.S. Department of Housing and Urban Development. (2007). *Measuring overcrowding in housing*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Retrieved from http://www.huduser.org/publications/pdf/Measuring_Overcrowding_in_Hsg.pdf.
- U.S. Department of Housing and Urban Development. (2015). *Worst Case Housing Needs: 2015 Report to Congress*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Retrieved from https://www.huduser.gov/portal/Publications/pdf/WorstCaseNeeds_2015.pdf.
- U.S. Environmental Protection Agency. (2011) *Highlights of the Exposure Factors Handbook* (EPA/600/R-10/030). Washington, DC: National

Center for Environmental Assessment. Retrieved from <http://www.epa.gov/ncea>.

U.S. Health Resources and Services Administration. (n.d.). *The Maternal, Infant, and Early Childhood Home Visiting Program: Partnering with parents to help children succeed*. Retrieved from <http://mchb.hrsa.gov/programs/homevisiting/programbrief.pdf>.

Vandivere, S., Hair, E. C., Theokas, C., Cleveland, K., McNamara, M., & Atienza, A. (2006). *How housing affects child well-being*. Coral Gables, FL: Funders' Network for Smart Growth and Livable Communities. Retrieved from http://www.fundersnetwork.org/files/learn/Housing_and_Child_Well_Being.pdf.

Voight A, Shinn M, and Nation M. (2012). The longitudinal effects of residential mobility on the academic achievement of urban elementary and middle school students. *Educational Researcher*, 41(9), 385-392.

Wachs, T. D., & Camli, O. (1991). Do ecological or individual characteristics mediate the influence of the physical environment upon maternal behavior? *Developmental Psychology*, 11, 249-264.

Wagner, M., Spiker, D., Hernandez, F., Song, J., & Gerlach-Downie, S. (2001). *Multisite Parents as Teachers evaluation: Experiences and outcomes for children and families*. Menlo Park, CA: SRI International.

Wagner, M., Spiker, D., Linn, M. I., Gerlach-Downie, S., & Hernandez, F. (2003). Dimensions of parental engagement in home visiting programs:

- Exploratory study. *Topics in Early Childhood Special Education*, 23(4), 171–187.
- Weinreb, L. F., Buckner, J. C., Williams, V., & Nicholson, J. (2006). A comparison of the health and mental health status of homeless mothers in Worcester, MA: 1993 and 2003. *American Journal of Public Health*, 96, 1444–1448.
- Wells, N.M. & Harris, J.D. (2007). Housing quality, psychological distress, and the mediating role of social withdrawal. *Journal of Environmental Psychology*, 27(1), 69-78.
- Whitman, T. L., Borkowski, J. G., Keogh, D. A., & Weed, K. (2001). *Interwoven lives: Adolescent mothers and their children*. Mahwah, NJ: Erlbaum
- Whitson, M. L., Martinez, A., Ayala, C., & Kaufman, J. S. (2011). Predictors of parenting and infant outcomes for impoverished teen parents. *Journal of Family Social Work*, 14, 284-297.
- Wiesenfeld, E. (1987). Residential density, locus of control, and crowding perception in popular housing projects. *Journal of Environmental Psychology*, 7(2), 143–158.
- Wood, D., Halfon, N., Scarlata, D., Newacheck, P., & Nessim, S. (1993). Impact of family relocation on children's growth, development, school function, and behavior. *The Journal of the American Medical Association*, 270(11), 1334-1338.

- Wood, M., Turnham, J., & Mills, G. (2008). Housing affordability and family well-being: Results from the housing voucher evaluation. *Housing Policy Debate, 19*(2): 367-412.
- Woodward, L. J., Fergusson, D. M., & Horwood, L. J. (2001). Risk factors and life processes associated with teenage pregnancy: Results of a prospective study from birth to 20 years. *Journal of Marriage & the Family, 63*(4), 1170–1184.
- Wright, B., Caspi, A., Moffitt, T. E., & Silva, P. A. (1998). Factors associated with doubled-up housing: A common precursor to homelessness. *Social Service Review, 72*, 92-111.
- Ziol-Guest, K. M., & McKenna, C. (2014). Early childhood housing instability and school readiness. *Child Development, 85*(1):103–13.

Table 1
Study variables

Time 1	Time 2	Time 3
Predictors	Housing Indicators	Outcomes
<ul style="list-style-type: none"> ▪ Race and ethnicity ▪ Age at childbirth ▪ Living with an adult ▪ Employment status ▪ Financial assistance ▪ Childhood history of maltreatment ▪ Maternal depression ▪ Substance use ▪ Neighborhood income 	<ul style="list-style-type: none"> ▪ Perceived overcrowding ▪ Perceived affordability ▪ Residential mobility ▪ Temporary living arrangements 	<ul style="list-style-type: none"> ▪ Duration in program ▪ Number of home visits ▪ Number of substantive secondary activities

Table 2
Descriptive Statistics for Full Sample, HVS and RIO Groups

	Full Sample (<i>N</i> = 563)	HV (<i>n</i> = 336)	RIO (<i>n</i> = 227)
<i>Baseline characteristics</i>			
Age at Enrollment [<i>M</i> , (<i>SD</i>)]	18.61 (1.28)	18.61 (1.29)	18.61 (1.27)
Ethnicity and Race (%)			
White, Non-Hispanic	37	34	42
Black, Non-Hispanic	20	22	17
Hispanic	34	37	30
Other	9	8	11
Preferred Language (%)			
English	76	76	78
Spanish	4	4	3
Other	1	1	0
English and Other	20	20	19
Place of Birth (%)			
United States	82	79	87
U.S. Territory (Puerto Rico)	6	8	4
Outside of United States	12	13	10
Born in Massachusetts (%)	69	70	68
Pregnant at Enrollment (%)	66	66	66
Age at Childbirth [<i>M</i> , (<i>SD</i>)]	18.77 (1.25)	18.77 (1.26)	18.77 (1.25)
Lived with an adult (%)	20.70 (3.95)	20.61 (3.98)	20.84 (3.90)
Employed (FT or PT) (%)	24.4	24.0	24.9
Financial assistance [<i>M</i> , (<i>SD</i>)]	1.39 (1.01)	1.43 (1.00)	1.34 (1.01)
History of maltreatment (%)	56.3	58	53.7
Depression (CES-D) [<i>M</i> , (<i>SD</i>)]	14.14 (10.69)	13.19 (9.89)	15.52 (11.64)
Used at least one type of drug (%)	19.6	16.4	23.8

Dissatisfied with housing (%)	79.5	81.0	77.4
Neighborhood Income [<i>M</i> , (<i>SD</i>)]	48,862.09 (26,786.50)	48,225.45 (27,272.07)	49,804.42 (26,082.33)
<i>Housing characteristics (T2) (%)</i>			
Perceived Crowding	22.9	22.2	23.9
Perceived Affordability	9.4	10.2	8.1
<i>Problems</i>			
Residential Mobility	17.4	17.0	18.1
Temporary Living Arrangements	13.5	15.3	10.7
<i>Program use variables [<i>M</i>, (<i>SD</i>)]</i>			
Duration (days)			494.49 (401.82)
Home visits			27.07 (27.47)
Substantive secondary activities			10.68 (17.68)

Table 3
Correlations among Background Characteristics and Housing Conditions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Crowding	1															
2. Affordability	.19**	1														
3. Mobility	.04	.12**	1													
4. Temp. living	-.03	.09*	.29**	1												
5. White	-.15**	-.10*	.06	-.13**	1											
6. Black	.05	.11*	-.11**	.22**	-.38**	1										
7. Hispanic	.10*	.03	.02	-.08	-.55**	-.36**	1									
8. Age at birth	-.04	.00	-.03	.07	.06	.14**	-.16**	1								
9. Adult/guard.	.11*	-.05	-.13**	-.25**	-.07	.01	.05	-.18**	1							
10. Employed	-.03	-.02	-.08	-.13**	.07	-.01	-.03	.14**	.03	1						
11. Finan. asst.	-.06	.04	.10*	.22**	-.01	.00	.02	.12**	-.35**	-.15**	1					
12. Maltreatment	.03	.03	.15**	.16**	-.13**	.00	.10*	-.11*	-.08	-.20**	.13**	1				
13. Depression	.14**	.10*	.09*	.03	-.05	-.02	.05	.05	-.04	-.01	-.03	.07	1			
14. Drug use	-.02	-.06	.10	-.07	.27**	-.12*	-.16**	.11*	-.08	.04	-.01	.02	.06	1		
15. Hous. dissat.	.20**	.12**	.09*	.17**	-.12**	.06	.08	.09*	-.01	-.13**	.13**	.19**	.11*	.05	1	
16. Neigh. inc.	-.09*	-.07	-.07	-.04	.25**	-.09*	-.26**	.07	-.04	.11**	-.13**	-.19**	-.02	.17**	-.08	1

Note. Temp. living = Temporary living arrangements; Adult/guard. = Living with an adult relative/guardian;
 Finan. asst. = Financial assistance; Hous. dissat. = Housing dissatisfaction; Neigh. inc. = Neighborhood income.
 * $p < .05$; ** $p < .01$.

Table 4
Correlations among Housing Challenges and Program Utilization Measures

	1	2	3	4	5	6	7
1. Perceived Overcrowding	1						
2. Perceived affordability	.19**	1					
3. Residential mobility	.04	.12**	1				
4. Temporary living arrangements	-.03	.09*	.29**	1			
5. Duration (days)	-.03	.01	-.11	-.10	1		
6. Home visits	-.03	.01	-.08	-.08	.93**	1	
7. Substantive secondary activities	-.01	-.01	.00	-.01	.47**	.49**	1

Note. * $p < .05$; ** $p < .01$.

Table 5
Model Fit Statistics for Latent Class Models with Two through Five Classes

Model Fit Statistics						
Models	Entropy	AIC	BIC	SABIC	LMR	BLRT
2 class	0.46	1856.14	1895.14	1866.57	0.11	<0.001
3 class	0.64	1843.98	1904.65	1860.20	<0.001	<0.001
4 class	0.89	1851.66	1933.99	1873.67	0.18	0.5
5 class	0.88	1860.69	1964.69	1888.50	0.04	0.67

Note. AIC: Akaike Information Criteria; BIC: Bayesian Information Criteria; SABIC: Sample-Size Adjusted BIC; LMR: Lo-Mendell-Rubin test; BLRT: Bootstrapped Likelihood Ratio Test.

Table 6
Regression Coefficients for the Four-Class Model of Housing Insecurity

	FHP						TLA				PAP	
	TLA		PAP		RM		PAP		RM		RM	
	B	OR	B	OR	B	OR	B	OR	B	OR	B	OR
Ethnic Background												
Hisp.	-0.10	0.91	0.20	1.23	-0.33	0.72	0.30	1.35	-0.24	0.79	-0.54	0.59
Non-Hisp. Black	1.29	3.64	0.69	2.00	-1.87	0.15	-0.60	0.55	-3.16	0.04	-2.56	0.08
Other non-Hisp.	0.04	1.04	0.60	1.81	0.96	2.62	-0.64	0.53	0.92	2.51	1.56	4.74
Age at childbirth	0.19	1.21	-0.02	0.98	-0.29	0.75	-0.22	0.80	-0.48	0.62	-0.27	0.77
Adult/guard. (T1)	-1.56	0.21*	-0.14	0.87	-0.97	0.38	1.42	4.14	0.59	1.81	-0.83	0.44
Emp. (PT/FT) (T1)	-2.11	0.12	-0.03	0.97	0.01	1.01	2.08	8.01	2.12	8.31	0.04	1.04
Finan. asst. (T1)	0.67	1.95*	0.05	1.05	0.43	1.54	-0.62	0.54	-0.24	0.79	0.38	1.46
Maltreatment	1.20	3.32	0.21	1.23	1.63	5.08	-0.99	0.37	0.43	1.53	1.42	4.13
Depression (T1)	0.05	1.05	0.03	1.03	0.01	1.01	-0.03	0.97	-0.05	0.95	-0.02	0.98
Drug use	-0.40	0.67	-0.77	0.46	0.08	1.08	-0.38	0.69	0.48	1.61	0.85	2.34
Hous. dissat. (T1)	16.30	>11x10 ⁶ ***	1.31	3.71*	1.14	3.13	-14.98	0.00***	-15.15	0.00***	-0.17	0.84
Neigh. Inc. (T1)	-0.01	0.99	-0.01	0.99	-0.01	0.99	0.00	1.00	0.00	1.00	0.01	1.01

Note. $N = 563$. Hisp. = Hispanic; T1 = Time 1; Emp. = Employment PT = Part Time; FT = Full Time.

* $p < .05$; *** $p < .001$.

Table 7
Summary of Count Regression Models for Program Utilization Outcomes

Model 1: Duration						
	<i>B</i>	<i>SE B</i>	<i>Z</i>			
Intercept	6.21	0.05	130.24***			
TLA	-0.44	0.22	-1.99*			
PAP	0.10	0.16	0.63			
RM	-0.23	0.23	-1.00			
Model 2: Home visits						
	Step 1			Step 2		
	Logistic portion of model			Count portion of model		
	<i>B</i>	<i>SE B</i>	<i>Z</i>	<i>B</i>	<i>SE B</i>	<i>Z</i>
Intercept	-1.91	0.18	-10.82***	3.39	0.06	53.22***
TLA	-9.37	0.38	-24.85***	-0.56	0.36	-1.57
PAP	-0.58	0.76	-0.76	0.07	0.20	0.34
RM	-9.95	0.31	-31.82***	-0.19	0.30	-0.64
Model 3: Substantive SAs						
	Step 1			Step 2		
	Logistic portion of model			Count portion of model		
	<i>B</i>	<i>SE B</i>	<i>Z</i>	<i>B</i>	<i>SE B</i>	<i>Z</i>
Intercept	2.26	0.20	-11.18***	2.02	0.14	14.40***
TLA	-7.72	0.39	-19.80***	-0.052	0.474	-0.109
PAP	0.22	0.65	0.35	-0.04	0.28	-0.15
RM	0.39	0.79	0.50	0.30	0.58	0.51

Note. $N = 336$. TLP = Teen Living Program; PAP = Perceived Affordability Problems; RM = Residential Mobility.

*** $p < .001$.

Table 8
Summary of Count Regression Models with Covariates

Model 1: Duration			
	<i>B</i>	<i>SE B</i>	<i>Z</i>
Intercept	6.16	0.14	44.75***
Black	0.29	0.12	2.40*
Hispanic	0.27	0.11	2.47*
Other race	0.10	0.19	0.52
Lived with an adult (T1)	0.00	0.11	0.00
Enrolled after childbirth	-0.24	0.10	-2.38*
Received food stamps (T1)	-0.23	0.12	-1.96
Depression	0.00	0.01	0.24
TLA	-0.38	0.24	-1.60
PAP	0.07	0.16	0.43
RM	-0.10	0.24	-0.41

Model 2: Home visits						
	Step 1			Step 2		
	Logistic portion of model			Count portion of model		
	<i>B</i>	<i>SE B</i>	<i>Z</i>	<i>B</i>	<i>SE B</i>	<i>Z</i>
Intercept	-1.55	0.51	-3.05**	3.42	0.17	20.14***
Black	-0.77	0.55	-1.40	0.20	0.15	1.30
Hispanic	-0.16	0.40	-0.40	0.31	0.14	2.21*
Other race	-1.30	1.08	-1.21	-0.05	0.23	-0.20
Lived with an adult (T1)	-0.28	0.42	-0.67	-0.06	0.14	-0.40
Enrolled after childbirth	0.17	0.39	0.44	-0.30	0.13	-2.35*
Received food stamps (T1)	0.19	0.40	0.49	-0.25	0.15	-1.69
Depression	-0.01	0.02	-0.34	0.01	0.01	1.02
TLA	-10.82	0.48	-22.43***	-0.42	0.37	-1.14
PAP	-0.59	0.76	-0.77	0.01	0.19	0.05
RM	-12.14	0.38	-32.00***	-0.07	0.30	-0.22

Model 3: Substantive SAs						
	Step 1			Step 2		
	Logistic portion of model			Count portion of model		
	B	SE B	Z	B	SE B	Z
Intercept	-2.05	0.55	-3.73***	1.67	0.29	5.80***
Black	-0.46	0.58	-0.80	0.51	0.24	2.13*
Hispanic	-0.24	0.47	-0.51	1.00	0.24	4.23**
Other race	-0.38	0.79	-0.49	-0.07	0.27	-0.27
Lived with an adult (T1)	-0.06	0.50	-0.13	0.08	0.23	0.32
Enrolled after childbirth	-0.13	0.41	-0.32	-0.36	0.20	-1.78
Received food stamps (T1)	0.11	0.49	0.23	-0.14	0.21	-0.65
Depression	-0.02	0.02	-1.17	0.00	0.01	-0.38
TLA	-9.58	0.47	-20.34***	0.15	0.48	0.31
PAP	0.34	0.67	0.51	-0.32	0.27	-1.20
RM	0.38	0.80	0.47	0.32	0.52	0.61

Table 9
Effect Sizes of the Standardize Mean Differences

	M_1	SD_1	M_2	SD_2	S_{pooled}	d
Program Duration						
TLA vs. PAP	321.89	220.60	553.31	446.27	403.33	-0.56
TLA vs. RM	321.89	220.60	398.93	353.28	311.64	-0.24
TLA vs FHP	321.82	220.60	499.58	403.81	399.92	-0.44
PAP vs. RM	553.31	446.27	398.93	353.28	415.29	0.36
PAP vs. FHP	553.31	446.27	499.58	403.81	407.39	0.13
RM vs. FHP	398.93	353.28	499.58	403.81	401.58	-0.25
Home Visits						
TLA vs. PAP	18.33	19.12	30.65	30.51	28.17	-0.43
TLA vs. RM	18.33	19.12	25.93	29.01	25.86	-0.28
TLA vs FHP	18.33	19.12	27.08	27.39	27.20	-0.32
PAP vs. RM	30.65	30.51	25.93	29.01	29.98	0.15
PAP vs. FHP	30.65	30.51	27.08	27.39	27.66	0.13
RM vs. FHP	25.93	29.01	27.08	27.39	27.47	-0.04
Secondary Activities						
TLA vs. PAP	11.22	13.52	10.00	11.34	11.91	0.10
TLA vs. RM	11.22	13.52	13.00	25.48	21.90	-0.08
TLA vs FHP	11.22	13.52	10.60	17.86	17.75	0.03
PAP vs. RM	10.00	11.34	13.00	25.48	17.76	-0.17
PAP vs. FHP	10.00	11.34	10.60	17.86	17.42	-0.03
RM vs. FHP	13.00	25.48	10.60	17.86	18.29	0.13

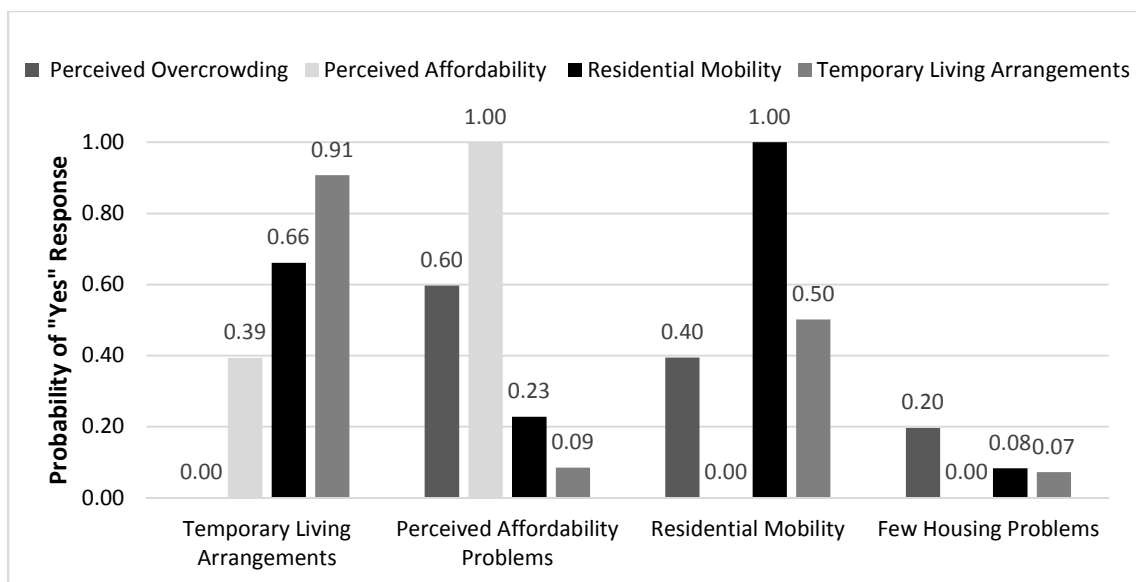


Figure 1. Four-class solution for latent class model of housing insecurity

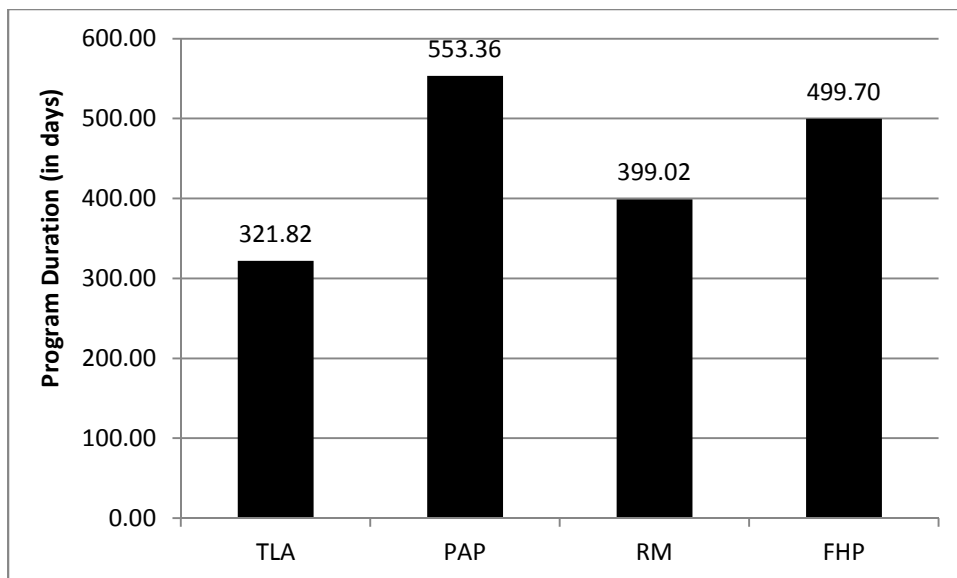


Figure 2. Expected program duration across latent classes

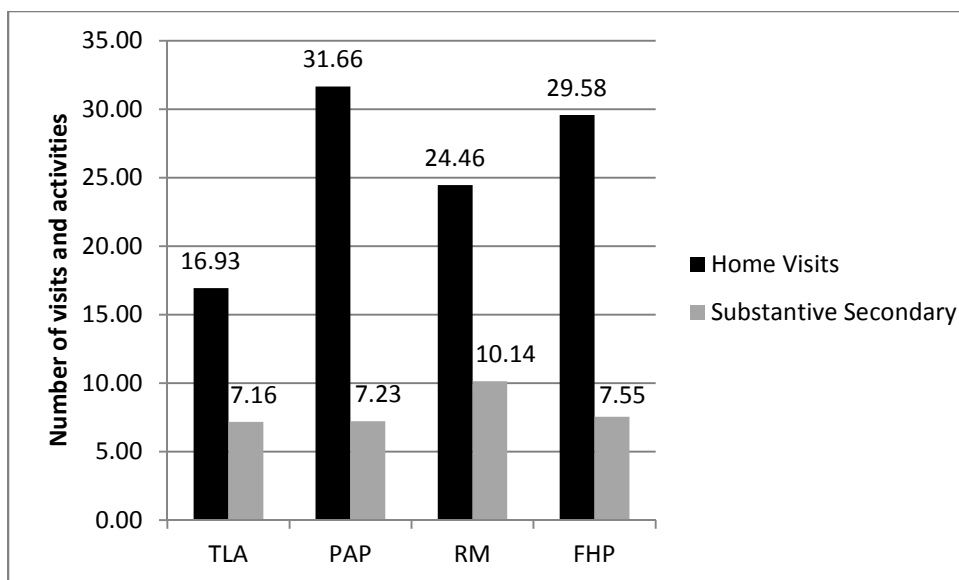


Figure 3. Expected number of home visits and substantive secondary activities

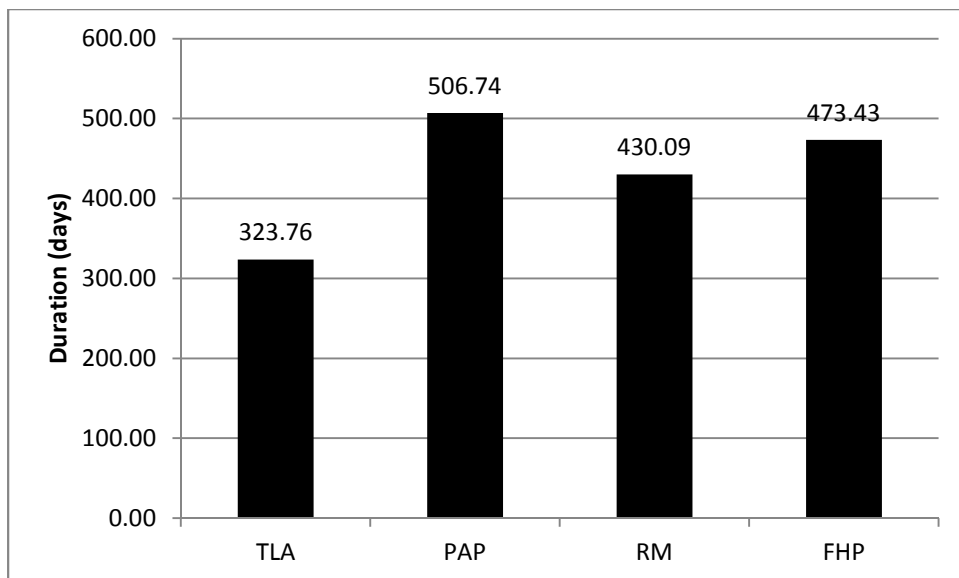


Figure 4. Expected program duration controlling for selected background characteristics

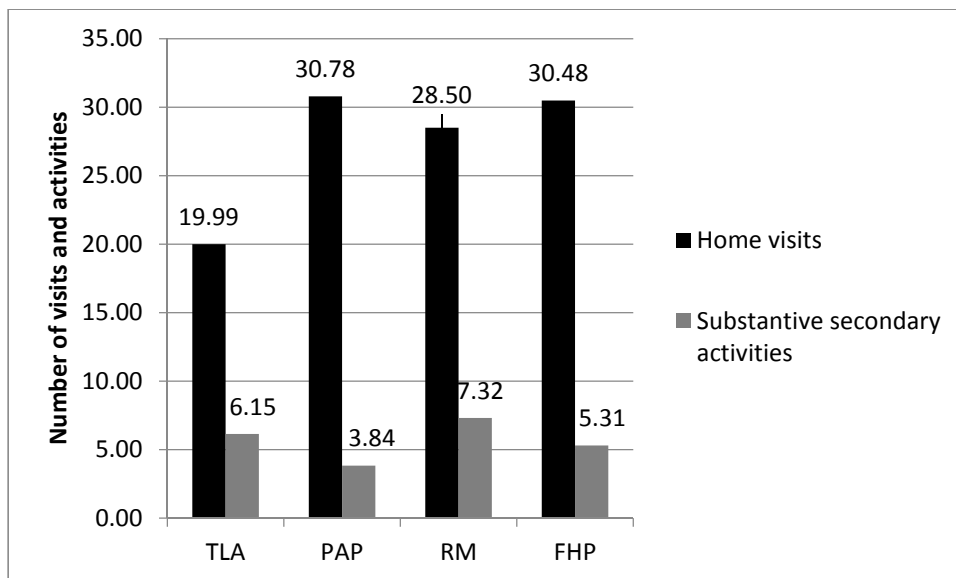


Figure 5. Adjusted means for home visits and substantive secondary activities