2020

Impacts of Housing Insecurity on Health Care Utilization and Parental Awareness of the Early Intervention Program

Sarah M. Farash
Bryn Mawr College, sarahfarashconsulting@gmail.com

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by

Sarah M. Farash

May 2019

Submitted to the Faculty of Bryn Mawr College
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy
in the Graduate School of Social Work and Social Research

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Dedication

In memory of Matthew Farash.

Acknowledgements

I am forever grateful for the mentorship and steadiness of my chairperson, Dr. Thomas Vartanian, throughout each of the intellectual and personal peaks and valleys that characterized my matriculation through the doctoral program. I am also indebted to each of my departmental committee members, Drs. Janet Shapiro, Leslie Alexander, and James Martin, for their refined contributions and continuous support. I also thank Dr. Michael Allen, Professor of Political Science, for contributing his time as the external reviewer and for his contributions during my proposal and manuscript defense meetings. I am especially appreciative of my entire committee's generosity and adaptability in extending their support via phone calls, videoconferences, and email exchanges while I completed the final stages of research and writing over 300 miles away from Bryn Mawr.

I also thank Dr. Betsy Bringewatt, a Rochester friend, whose words of wisdom and support were invaluable in helping me minimize the impact that feelings of impostor syndrome had on my progress. Additionally, I am eternally grateful for the mentorship of Drs. Pamela Viggiani and Elizabeth Herbert during my participation in the Leadership Education in Neurodevelopmental and Behavioral Disabilities program at the University of Rochester. Through their support, I gained access to a cascading network of connections that informed the development of my dissertation research project and led to conversations with decision-makers at early childhood care centers, school districts, and pediatric departments where I eventually piloted my survey and recruited study participants.

Speaking of recruitment, I am deeply grateful for the encouragement and contributions of my dear friend Sarah Ozimek. Sarah created the most eye-catching research recruitment flyers that I have ever utilized in the ten-plus years that I worked on clinical trials research projects. I

am equally grateful for the expertise and generosity of Susan Fox and Martín Alonso. Susan and Martín spent numerous hours editing the Spanish translations of the study documents so that I could reach out to Spanish-speaking families and offer them an opportunity to participate.

Additionally, I owe a tremendous amount of gratitude to my father, Michael Farash. Not only has he always believed in me and at times served as babysitter, grocery delivery driver, and snow-clearing angel, he made it possible for me to work with an incredible writing and accountability consultant, Dr. Kat Malinksy. Through working with Dr. Kat, I developed an unshakable confidence and enthusiasm for scholarly writing. I am also so grateful for my brother Cameron who introduced me to the profession of social work and continues to inspire me as he collaboratively transforms systems of care within the peer recovery movement in our state.

Most importantly, I thank my husband, Justin, for his cool equanimity, diverse playlist recommendations, and balanced contributions of intellect, practicality, and playfulness at exactly the right moments! I am also grateful for of our son, Phoenix, who was born in the middle of this journey and encouragingly titled me "professor mommy" as soon as he was capable of stringing multisyllable words together. This work springs forth from a wide network of support and inspiration from those directly acknowledged and from an incalculable amount of additional family, friends, and colleagues. May the completion of this work signal the beginning of my scholarly journey working collaboratively with others to promote health equity and racial justice among families with the youngest of children who have special health care needs.

Abstract

Among children under three experiencing housing insecurity associated with poor developmental outcomes and decreased medical visit adherence, parental lack of awareness of the Early Intervention program (EI) may foreshadow racial and economic disparities in EI utilization rates. Informed by a social determinants of health and health equity model, I explore whether housing insecurity impacts children's access to routine well-child pediatric visits where parents have opportunities to become aware of EI. Utilizing logistic regression analyses of cross-sectional telephone interview data collected from parents of three-year-old children in Rochester, NY, I find that parents of multiracial and African American children are less likely than parents of white and Latinx children to be aware of the EI program despite achieving continuity of care. Findings persisted when controlling for parental concern about children's development and children's health at birth. Implications for social work practice and policy with children and families experiencing housing insecurity are discussed.

Chapter One – Introduction

Social adversities impacting child development are best addressed as early as possible in children's lives (National Scientific Council on the Developing Child, 2007; Pascoe, Wood, Duffee, & Kuo, 2016; Shonkoff & Phillips, 2004). The first three years of neurobiological growth and development is known to be fundamental, but not deterministic, in shaping foundational neurobiological processes related to more complex developmental gains later in life (Shonkoff & Phillips, 2004). To ensure that therapeutic support is universally available to the youngest of developing children showing signs of developmental delays or disabilities, the Early Intervention program (EI) mandated by Part C of the Individuals with Disabilities Education Act (IDEA) was most recently reauthorized in 2004 (IDEA, 2004).

The EI program offers family-centered, developmentally supportive services for children younger than 36 months of age who meet specific developmental delay criteria, regardless of family income level. Services are designed to be delivered in children's natural environment including in the home or at daycare centers (New York State Department of Health, 2004). Program coordinators are charged with identifying any additional needs the family may have that when remedied would positively influence the family's pattern of interactions with the child (Guralnick, 2011).

In Monroe County, NY, the setting for this study, Early Intervention services are administered by the county and paid for by a combination of federal block grants and state budget allocations (New York State Department of Health, 2004). Due to the widely acknowledged priority of addressing developmental delays as early as possible in a child's development, children's eligibility for the program is solely determined through developmental evaluations. The eligibility determination and enrollment processes are the same for families at

all ranges of the income spectrum. No one is turned away due to lack of financial resources and services are provided at no cost to families (New York State Department of Health, 2004). Although the foundation of EI includes the intention to make the program universally accessible to all children experiencing delays in their development, program specific and state-level explorations of enrollment rates across the U.S. indicate that program is not reaching children who may be most in need of additional developmental support.

Researchers have estimated that approximately 10-12% of children under three have a developmental delay (Rosenberg, Ellison, Fast, Robinson, & Lazar, 2013) yet the average percent of the total population of children born in the U.S. who were served by Early Intervention between 2015 and 2017 was only 3.2% (IDEA Section 618 Data Products: Static Files, 2015, 2016). Additionally, in a single-site study of low-birth-weight (LBW) babies who spent time in a Neonatal Intensive Care Units (NICU) and attended follow-up appointments, approximately 70% of LBW children who would have been eligible based on their weight at birth were not enrolled in EI by the time they reached their first follow-up appointment (Atkins, Duvall, Dolata, Blasco, & Saxton, 2017).

Furthermore, a study examining racial differences in receipt of EI services among children birth to three found that at 24 months of age, African American children with an established developmental delay and the absence of a medical condition underlying the delay were five times less likely to receive services than white children with established delays and no medical conditions (Feinberg, Silverstein, Donahue, & Bliss, 2011). Where data is available, Early Intervention has been found to be both underutilized in general (Atkins et al., 2017) and some EI programs have found racial disparities in program utilization rates such that African

American are less likely than white children to be enrolled in EI although they have similar developmental profiles (Feinberg et al., 2011).

Early identification and intervention for children born prematurely and those born with other neurodevelopmental challenges has been shown to improve child functioning and developmental outcomes (Hardoff et al., 2005; Sutton & Darmstadt, 2013). For all newborns, infants, or toddlers under 3-years-old experiencing developmental delays, the Early Intervention program is the only universally available program specifically targeting the improvement of children's development that is free-of-charge to families regardless of family income level (New York State Department of Health, 2004). There are few studies that have examined why racial disparities in EI utilization have persisted.

Researchers and service providers who have examined patterns of underutilization in voluntary intervention programs have used the terms "hard-to-reach" or "underserved" to describe populations of people of specific demographic characteristics who are repeatedly found to have low rates of participation in available services compared to people who represent other identities within those demographic categories. For example, populations of people living in low-income households and people who identify as racial minorities are described as "hard-to-reach" or "underserved" when they were found to underutilize voluntary programs designed to alleviate social or health-related adversities compared to participation rates of higher income, non-minority populations (Boag-Munroe & Evangelou, 2012). A systematic review of literature on how to reach hard-to-reach families and individuals describes two main categories of issues that can be identified both as barriers and pathways to enrollment in voluntary support programs: communication-related factors and service setting-related factors (Boag-Munroe & Evangelou, 2012).

Though racial disparities in parental engagement with voluntary programs that support children's development were not specifically targeted by the review, Boag-Munroe and Evangelou (2012) emphasize that it might not be a lack of perception of a need for the service or related attitudinal characteristics of the individual or family that are the source of the barrier in participation, rather, it may be culturally incongruent marketing and communication strategies that lack specific strategy and messaging aimed at quelling any feelings of stigma around program participation.

Specifically related to differences in rates of early identification and treatment of developmental delays in children, racial disparities in parental knowledge about children's developmental milestones and lack of knowledge about signs their children might show indicating a possible delays or disabilities (Zuckerman, Chavez, Regalado Murillo, Lindly, & Reeder, 2018) have been found to be precursors to racial disparities in children's ages at the time of receipt of diagnoses and lower rates of service utilization among minority children compared to white children (Magaña, Parish, Rose, Timberlake, & Swaine, 2012; Parish, Magaña, Rose, Timberlake, & Swaine, 2012).

Similarly, Boag-Munroe and Evangelou (2012) emphasize that a lack of knowledge about the condition for which help is offered, or, a lack of knowledge of the existence of programs to alleviate or help with specific issues may serve as a barrier to service utilization. In Rochester, NY and the surrounding suburbs in Monroe County, there is a lack of data to assess whether parents of children in the first three years of life who may be at higher risk for the development of delays or disabilities are receiving and understanding information about developmental milestones. There is also a lack of data to assess if parents of children between the ages of birth

and three are receiving information about the existence of the Early Intervention program in a timely manner.

Regarding utilization of the Early Intervention program among "hard-to-reach" children and families, there is also a lack of administrative data available in Rochester, NY and the surrounding suburbs to assess whether there are racial disparities in parental awareness of Early Intervention. There is also a lack of administrative data in health settings to determine if children born with low birth weight or prematurely who may be at higher risk of developmental delays or disabilities and may have automatically eligible for EI (IDEA, 2004; New York State Department of Health, 2004) are utilizing Early Intervention services in a timely manner.

Following from the complex discussion in Boag-Munroe and Evangelou (2012) emphasizing the need to explore possible barriers to awareness about programs designed to support "hard-to-reach" populations, it is necessary to identify the processes and timepoints during the first three years of children's lives through which parents may have opportunities to learn information about the Early Intervention program. Although there are many pathways through which parents may learn about Early Intervention services, the primary pathway that is universally available to all children is through conversations with pediatricians during well-child visits where developmental screenings are routinely administered and information about Early Intervention and related programs is offered to parents (American Academy of Pediatrics, 2002).

For the purposes of exploring children's patterns in well-child visit attendance and parental awareness of Early Intervention among children at higher risk for experiencing developmental delays due to birth health characteristics, I place primacy on exploring the relationship between housing insecurity, pediatric health care utilization, and parental awareness of EI during the first three years of life. In Rochester, NY and the surrounding suburbs, as in

other similarly sized greater metropolitan areas, African American children and children of other racial minority identities are more likely to live in isolated areas of concentrated poverty where experiences housing insecurity, in the form of a lack of affordability of housing and high rates of homelessness, are also more common (Doherty, 2013).

Housing insecurity experienced in early childhood is associated with poor behavioral, developmental, and physical health outcomes (Cutts et al., 2011). Tandem experiences of various forms of housing insecurity and economic insecurity in early childhood are associated with the presence of parental experiences of psychological stress and disorganization (Mayberry, Shinn, Benton, & Wise, 2014; Vásquez-Vera et al., 2017) and disruptions in family functioning (Cutts et al., 2011; McManus, Magnusson, & Rosenberg, 2014). These features may also interfere with children's attendance at medical visits or parental understanding at visits where information about children's development and about EI services may be given. Therefore, exploring birth health histories, housing histories, medical visit histories, and parental awareness of EI among children who may be at risk for delays in their development could provide a model for exploring dynamics that foreshadow known racial disparities in EI enrollment among low-income and African American children in other geographic areas.

There is a lack of administrative information available in Rochester, NY to explore whether children are experiencing higher than expected rates of housing insecurity and parallel disruptions in access to resources used to support family routines. However, we do know that minority children in Rochester, NY are experiencing disproportionally high poverty and extreme poverty rates as well as high rates of low birth weight and prematurity compared to non-minority peers (Doherty, 2017). We also know that on average in the last four years, only 55% of children graduating from Universal Pre-K classrooms in the city of Rochester, NY who were

assessed at kindergarten entry were reported to have skills ready to start kindergarten (ROC the Future, 2018).

Childhood development from birth to three lays the foundation for future academic skills and development along multiple domains (Shonkoff & Phillips, 2004). In geographic areas with high rates of poverty, racial disparities in low birth weight and prematurity, and unknown rates of housing insecurity occurring during the first three years of children's lives, it is important to explore whether or not housing insecurity is occurring and if this specific social adversity is interfering with children's access to medical visits where parental awareness of the Early Intervention program may be offered.

Therefore, I explore whether children are experiencing housing insecurity and whether housing insecurity impacts children's utilization of health care services where developmental screenings and the receipt of information about Early Intervention occur. I also explore if there are any racial disparities in parental awareness of Early Intervention. Additionally, I examine whether racial disparities exist in attendance at well-child pediatric visits or in access to continuity of medical care, processes meant to support families in receiving information about the Early Intervention program. This project utilizes a cross-sectional telephone survey interview with parents of three-year old children to gather information about children's histories

of housing insecurity, health care utilization, and health status during the first three years of their lives.

However, examining processes underlying parental awareness of Early Intervention requires a framework that acknowledges the non-linearity and multidimensionality of the detrimental health impacts of social adversities on children and the tandem, complex processes

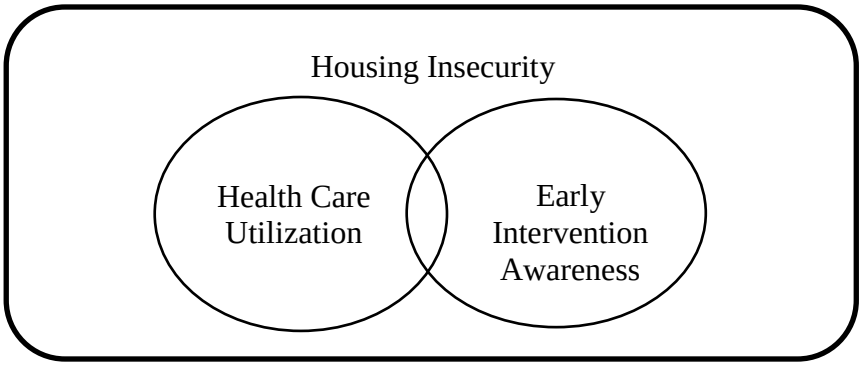

Figure 1. The intersection of health care utilization and parental awareness of EI among insecurely housed children.

associated with engaging with pediatric preventative and developmentally promotive care systems. I use the social determinants of health (SDH) framework to explain the link between social adversities, health care utilization and parental awareness of the Early Intervention program in this project (Braveman, Egerter, & Williams, 2011).

Figure 1 illustrates the general relationship between the three primary constructs investigated in this study. A specific social adversity, housing insecurity, is examined for its relationship to patterns of health care utilization and parental awareness of the Early Intervention program during the first three years of children's lives. In subsequent chapters, I offer an adaptation of the upstream and downstream metaphor traditionally used to illustrate the social determinants of health framework to explore the relationship between social adversities and health outcomes. I also use this framework to explore specific pathways where the existence of

racial disparities may play a unique role in understanding patterns in parental awareness of the Early Intervention program among children of different racial identities in the sample.

Additionally, I propose a multidimensional exploration of indicators of housing insecurity for their impact on components of health care utilization and parental awareness of the Early Intervention program. The specific intersection of health care utilization and Early Intervention awareness investigated in this study are well-child visits where parental awareness of Early Intervention may be influenced by interactions with providers during routinely scheduled pediatric developmental screening assessments. Lastly, the impact of various indicators of housing insecurity on urgent care use and emergency department use are also explored despite the lack of a conceptual connection between these health care services and parental awareness of Early Intervention.

Study Purpose

This exploratory study is designed to shed light on dynamics of parental awareness of the Early Intervention program during the first three years of children's lives in Rochester, NY and the adjacent suburban areas. I created and conducted a semi-structured telephone interview with a sample of forty caregivers of three-year-old children recruited from hospital waiting rooms, daycare and educational centers, and local social media parent groups. I asked caregivers questions about the first three years of their children's lives including information about housing histories, medical visit histories, and other child and household characteristics. Utilizing their responses, I investigated whether housing insecurity may impact children's health care utilization patterns and if housing insecurity impacts the likelihood of parental awareness of the EI program.

Specifically, this exploratory study had three primary objectives. First, I explored various indicators of housing insecurity for their impact on a sample of three-year-old children's health care utilization patterns represented by well-child visit attendance frequency, outpatient pediatric medical visit continuity of care, and use of urgent care and emergency departments for sick visits. I identified if missed outpatient medical visits of any kind occurred because of gaps in access to transportation or child care. I also identified if parents reported that the gap in access to the named resources were connected at all to housing status changes.

Second, I explored factors associated with parental awareness of the Early Intervention program. I specifically explored if children's housing histories, mediated by parental concern about their child's development, were associated with parental awareness of the Early Intervention program. I also explore for these relationships while controlling for child health status at birth. Among parents who reported knowing that the Early Intervention program exists, I also identified whether parents reported that their children's medical providers had ever given them information about the Early Intervention program.

Third, I explored racial disparities in birth outcomes, patterns of health care utilization, and parental awareness of the Early Intervention program in the study sample. The next section, on the significance of this project to the field of social work, highlights the ethical necessity of adding a health equity lens to the social determinants of health framework to explore the sample for racially disparate patterns.

Exploring for Racial Disparities in Social Work Research

Known racial disparities in birth outcomes have persisted despite improved access to prenatal care (Blumenshine, Egerter, Barclay, Cubbin, & Braveman, 2010; Lu & Halfon, 2003; Zhao et al., 2015). Additionally, a study of birth certificate data gathered from a 4-year period of

births between 2008 and 2012 paired with 2010 census tract data in Western NY found that neighborhoods with higher concentrations of African American children and children of other minority identities are more likely than neighborhoods with low concentrations to have high rates of children born with low birth weight births (LBW) (Insaf &Talbot, 2016). These disparities remained significant even after for controlling for behavioral and socioeconomic factors at the individual level (Insaf & Talbot, 2016). Having an awareness of these trends as a social work researcher necessitates that health equity be the primary impetus for exploring the intersections among housing insecurity, health care utilization, and parental awareness of Early Intervention in this project. It also necessitates exploring the study sample for the presence of racial disparities as they have been shown to exist and in ways that may highlight different but related dimensions of these disparities.

There is a natural harmony in examining racial disparities in patterns of health care utilization and parental awareness of the Early Intervention program through the lens of health equity within the field of social work research. Social work practitioners and researchers are bound by the code of ethics to "help people in need address social problems" and to "challenge social injustice" (National Association of Social Workers, 2017). Low-income children in other geographic areas have been found to be underrepresented in participating and having received a referral to the Early Intervention program (Clements, Barfield, Kotelchuck, & Wilber, 2008; Tang, Feldman, Huffman, Kagawa, & Gould, 2012; Wang et al., 2009). However, data on the participation rates of low-income children compared to other children in the location of this study is not publicly available.

The recruitment setting for this study, Rochester, New York, continues to have the highest rates of poverty among children compared similarly sized cities and it is the fifth poorest

city overall in the U.S. (Doherty, 2015). In Rochester, approximately 50 % of all children under the age of 18 live in poverty and 16.3% of the population of children in poverty live in extreme poverty, defined as living at 50% or below of the federal poverty level (Doherty, 2017).

Social determinants of health interact with a person's racial identity when social adversities are disproportionately experienced by people of specific racial groups compared to others with measurable causal components of heath conditions held constant, such as age, weight, or health history (Cook, McGuire, & Zaslavsky, 2012). Housing insecurity and poverty are social determinants of health that interact with children's racial identity because housing is predominantly racially segregated such that African American children are more likely to live in isolated areas of concentrated poverty compared to white children in Rochester, NY, as well as in the U.S. at large (Doherty, 2013; D. R. Williams & Collins, 2001).

Specific to the setting of this study, a report published using 2010 U.S. Census data found that 66.7% of the total population of people living at or below the poverty line in the nine-county region in Western NY live within Monroe County. More alarming, 40.8% of the nine-county region's population living in poverty are in Rochester, NY, the metropolitan area inside of Monroe County (Doherty, 2013). Additionally, 34% of the population of African American people in the nine-county region live at or below the poverty line compared to only 10% of the population of white people (Doherty, 2013).

The concentration of poverty and racial isolation associated with tandem experiences of housing insecurity and health outcome disparities across the lifespan has been widely documented (Hughes, Matsui, Tschudy, Pollack, & Keet, 2017; Mendenhall, 2018; Sampson & Sharkey, 2008; D. R. Williams & Collins, 2001). However, rarely do studies examine these patterns in children as young as the ages of birth to three-years-old. Particular to the setting of

this study, Rochester, NY, the proportion of children by racial identity who are three-years-old or younger and are living in poverty is not known. Additionally, there is a dearth of information on how the interaction between a child's racial identity, poverty status, or housing status may impact access to preventative care or developmentally promotive care within the first three years of a child's life. Therefore, the examination of racial disparities in this exploratory study is undertaken with two goals in mind: 1.) the examination of racial disparities replicates what is already known about racial disparities in birth health outcomes, and 2.) the examination of racial disparities is designed to discover if there are also disparities in utilization of pediatric health care services and in parental awareness of the Early Intervention program.

Additionally, in 2016 in New York state, approximately only 2% of children under the age of 6 who were eligible for Medicaid or State Children's Health Insurance Program (S-CHIP) were uninsured (Children's Defense Fund, 2017). Therefore, among children experiencing tandem housing and economic insecurities in New York state, it is likely that insurance status is not a barrier to accessing pediatric health care visits. Exploring factors associated with health care utilization and Early Intervention awareness for a sample of children with relatively stable access to health insurance will extend conversations on social determinants of health without questioning if barriers in care may be related to a lack of heath care insurance access.

Known demographics and racial disparities in birth health. There are semi recent birth health statistics in Monroe County, NY and New York state that have been explored for the presence of racial disparities. According to the most recently available data from the year 2014 in Monroe County, NY, African-American children were 2.5 times as likely to be born with low birth weight than non-Hispanic white children (Doherty, 2017). African American children in Monroe County, NY were 1.73 times as likely on average during the period of 2014-2016 to be

born prematurely at or before 37 weeks gestation compared to non-Hispanic white children (New York State Prevention Agenda Dashboard - County Level, 2018).

Some information is also available regarding well-child visit attendance rates for children in Monroe County, NY. Children ages birth through 15 months and ages 3, 4, 5, and 6 years old in Monroe County, NY who were enrolled in state-administered Medicaid managed health care plan in 2018 were between 83% and 84% adherent to the recommended pediatric well-child visit schedule (New York State Prevention Agenda Dashboard - County Level: Monroe County, 2018). Information on the rates of enrollment for children of different racial identities was not available.

Although this study will not address specific dynamics of the encounter between parents and providers nor the pathways through which culture and race may operate and impact the outcomes of the clinical encounter, the interpersonal and communication dynamics of parents and providers are one of the pathways through which these dynamics may play out. Janet Shim's (2010) presentation of cultural health capital and its role in unequal treatment in health care settings as well as Michelle van Ryn and Steven Fu's (2003) discussion of dynamics of bias operating in health care and public health settings offer excellent starting points for examining this important feature of parent and provider dynamics and its role in health equity.

Pertinent to this project, known racial disparities in birth outcomes and known racial disparities in EI utilization rates make the need to explore young, African American children's access to well-child visits and caregiver awareness of Early Intervention even more pressing than for non-African American children. However, it is beyond the scope of this study to dive deeply into the dynamics of structural inequalities, institutional racism, or interpersonal microaggressions that may be uniquely influencing caregivers of African American children's

engagement with health care and developmental service systems. Instead, this study offers an exploratory effort of examining the study sample for the presence of disparities in birth health outcome and parental awareness of the Early Intervention program.

Research Questions

The following are specific questions related to the objective to explore whether various indicators of housing insecurity are associated with health care utilization patterns among children during the first three years of life:

1) Does housing insecurity impact the likelihood of missing well-child visits or the likelihood of receiving continuity of care for outpatient visits?
2) Does housing insecurity impact the likelihood of attending sick visits at a location other than an outpatient doctor's office?
3) Does the presence of housing insecurity impact the likelihood that children ever missed and rescheduled an outpatient medical visit due to a lack of access to transportation or childcare?

The following are specific research questions related to the objective to understand the relationship between housing insecurity, pediatric health care utilization patterns, and parental awareness of the Early Intervention program during the first three years of children's lives:

1) Is there a relationship between the presence of housing insecurity and parental awareness of the Early Intervention program when controlling for child health status at birth?
2) Do continuity of care in outpatient pediatric medical settings or parental concern about children's development mediate the relationship between housing insecurity and parental awareness of the Early Intervention program?

The following questions are related to the objective to explore the sample for racial disparities in birth health outcomes and parental awareness of the Early Intervention program:

1) Are African American children more likely to be born with low-birth weight or prematurity compared to children of other racial identities?
2) Are there racial disparities in parental awareness of the Early Intervention program?
    a. Do racial disparities in parental awareness of Early Intervention change in magnitude or direction when controlling for parental concern about children's development?
    b. Do racial disparities in parental awareness of Early Intervention change in magnitude or direction when controlling for children's health status at birth?

Addressing the Gaps

A secondary contribution of this study was to address gaps in the literature on conceptualizing housing insecurity. Specifically, I explore the relationship among multiple operationalizations of housing insecurity rather than setting out a single operational definition, a priori. I also separately identify housing insecurity definitions that include homelessness from those that do not. In doing so, I further separate and explore indicators of housing insecurity related to housing mobility. Additionally, I explore both a continuous and discrete variable representations of housing insecurity indicated by specific patterns of residential mobility found to be associated with poor health outcomes in young children.

General Organization

In this introductory chapter, the significance of the problem of underutilization of the Early Intervention program and its relationship to housing insecurity, health care utilization, and parental awareness of the Early Intervention program has been described. The study purpose,

methodology, and primary research questions addressed in this project have also been presented. In the next chapter, I present background literature on housing insecurity. I draw attention to the lack of a unified conceptual definition of housing insecurity and provide justification for multiple indicators of housing insecurity utilized in this study. Also presented is a summary of the literature on the impacts of housing insecurity on families and children.

In Chapter Three, I further contextualize housing insecurity using a traditional social determinants of health framework approach in understanding children's health outcomes. First, I present a traditional application of the social determinants of health model in understanding the impact of homelessness on children's health outcomes. Next, I present the rationale for shifting from a traditional social determinants approach that examines health outcomes to an approach that examines the connection between health care utilization and parental awareness of the Early Intervention program. The argument will be made that this shift requires that the adapted social determinants of health framework be contextualized within a health equity lens focusing on reducing racial disparities in health outcomes and health care utilization patterns. Additionally, I offer a rationale for the application of the SDH framework in this project by summarizing the limitations of past research efforts to understand barriers to participation in pediatric preventative care and barriers to referral and enrollment in the Early Intervention program.

In Chapter Four, I present how the social determinants of health model is utilized in this study to develop a conceptual framework for investigating the specific constructs and pathways intersecting housing insecurity, health care utilization, and parental awareness of the Early Intervention program. I hypothesize that examining the intersection between housing insecurity, health care utilization patterns, and parental awareness of the Early Intervention program extends

the conversation on health equity promotion to explore a set of factors that precede parent enrollment of their child into the Early Intervention program, among potentially eligible children.

By doing so, this project extends the dialogue on issues related to health equity specifically to the period of early childhood. I also simultaneously examine the intersections between housing insecurity with health care utilization for racial disparities that may be easily overlooked. Since young children are unable to act on their own behalf, identifying potentially racially disparate experiences in parental access to knowledge, resources, and services regarding their children's development is of central importance to unpacking complex dynamics impacting equity in health care access among the youngest children.

Chapter Five describes the study methodology utilized in creating the semi-structured interview and presents the research design including information about sample recruitment strategies and the data collection process. Chapter Six presents the sample characteristics and the results of the study. Chapter Seven details the implications and limitations of the study and makes recommendations for practice, policy, and research in multiple, intersecting fields.

Chapter Two -- Background Literature on the Conceptualization of Housing Insecurity

In this chapter, I contextualize the theoretical assumptions and scope of the conceptualization of housing insecurity. The following is a discussion of what has been identified in prior literature as the primary features of housing insecurity. The discussion includes an exploration of housing insecurity for its impact on child and family outcomes. In this chapter, I lay the foundation for the developmentally-contextual, multidimensional approach that I used in exploring the association between housing insecurity, pediatric health care utilization, and parental awareness of Early Intervention program.

General Definition

Housing insecurity is a nebulous term used in policy and research to mean an array of different situations. It often appears interchangeably with terms like "housing instability", "residential insecurity", "residential instability", and even "homelessness" (Clark, 2010; Cotton & Schwartz-Barcott, 2016; Cox, Henwood, Rice, & Wenzel, 2017; Cutts et al., 2011; Jelleyman & Spencer, 2008; Mayberry et al., 2014) The term "housing insecurity" will be primarily utilized throughout this paper and can be considered synonymous with residential insecurity, residential instability, and housing instability. However, the terms "homelessness" and "housing insecurity" will not be used interchangeably. Instead, homelessness will be considered as a set of conditions that are indicators of housing insecurity. A discussion on the definition of homelessness and its presence in this study as one type of indicator of housing insecurity will be explored in the next section.

Regarding the formulation of a definition of housing insecurity, a recent study put forth a definition of residential instability after using Wilson's (1963) method concept analysis technique with a sample of low-income families (Cotton & Schwartz-Barcott, 2016). After

conducting a literature review and analyzing real-life examples of model, contrary, borderline, and related cases, the authors suggest the following definition of residential instability: "a patterning of abrupt, unforeseen, changes in short-tenure occupancies that are driven by imperative need," (Cotton & Schwartz-Barcott, 2016, p. 260). Embedded in this definition is the assumption that "changes in short-tenure occupancies", or the act of moving housing locations over short time periods, is a required dimension of residential instability. While the specific meaning of "short-tenure" is appropriately left undecided, the inclusion of "changes" in housing as a necessary requisite is debatable.

Other systematic literature reviews and qualitative research on housing instability have illustrated that moving residences is not a necessary condition of instability (Clark, 2010; Cox et al., 2017). Requiring moves in the definition of residential instability excludes experiences that would otherwise qualify as a lack of adequate housing. Regardless of the desire to move, families and may experience housing insecurity characterized by over-crowdedness, lack of affordability, or poor structural integrity, for example.

The U.S. Department of Health and Human Services (DHHS) put forth five indicators of housing insecurity in 1969 that include but do not require residential moves. These indicators of housing insecurity have remained relatively unchanged: 1.) housing costs greater than 30% of income (affordability); 2.) poor plumbing, heat, electricity, leaks, holes, etc. (poor quality housing); 3.) high rates of crime, high rates of poverty, high rates of unemployment, poor utility services, etc. (neighborhood instability); 4.) more than two adults to a bedroom (overcrowding); 5.) and conditions of homelessness (Department of Health & Human Services [DHHS], 1969). While Cotton and Schwartz-Barcott (2016) require in their definition that moving residences be a

fundamental characteristic of housing insecurity, the DHHS (1969) indicators omit characterizing any specific incidences of residential moving as housing insecurity.

Since 1969, numerous studies have found negative associations between individual's health and wellbeing and patterns of housing insecurity that are defined by varying thresholds of moving homes over varying lengths of time. Higher frequency residential mobility over shorter durations of time has been routinely associated with poor psychological, developmental, and health outcomes in young children and adolescents (Clark, 2010; Coley, Kull, Leventhal, & Lynch, 2014; Cutts et al., 2011; Jelleyman & Spencer, 2008; Murphey, Bandy, & Moore, 2012). Therefore, some form of residential mobility is included in the conceptual definition of housing insecurity used in this study.

Since an exemplary definition of housing insecurity encompassing a broad enough range of experience has yet to be conceptualized, this study utilizes a broad definition that includes four primary indicators of housing insecurity and one additional indicator encompassing characteristics of reasons for moving. The indicators included in this study are adapted from the DHHS (1969) list of five indicators of housing insecurity. The four included indicators are as follows: 1.) various conditions of homelessness, 2.) residential mobility, 3.) affordability, and 4.) crowdedness. Structural quality and neighborhood safety, two indicators omitted from the DHHS set of indicators in this study, are included only when they are a component of reasons for moving, a characteristic of residential mobility. The fifth indicator of residential mobility is based on Clark's (2010) categorization of push and pull factors relating to reasons for moves among families living in urban poverty in combination with Kleit, Kang, and Payton Scally's (2016) three dimensions through which residential mobility is conceptualized as housing insecurity.

Specifically relating to children, a broad definition of housing insecurity includes any type of housing situation that is "precarious, unsafe, or unsustainable" that threatens a child's health or development (Marcal & Fowler, 2015). Additionally, unsafe qualities of social and familial relationships within the home, such as those caused by domestic violence or illicit substance use, negatively impact children's health or development and have been identified as form of housing insecurity. This study limits its exploration of housing insecurity by excluding forms housing insecurity that relate to familial relationships or dynamics within the home where children remain in the home and do not move residences. Unsafe qualities of social or familial relationships are included in this study when they are also related to reasons for moving. This connection is further explored in a later sub-section on specific indicators of housing insecurity related to reasons for moving.

Next, a deeper review is presented of each of the five primary housing insecurity indicators and their direct and indirect impacts on pediatric health care or related service utilization. A summary of all five of the indicators of housing insecurity and the limitations, scope, and specific features of the exploration of housing insecurity in this study will be presented.

Indicators of Housing Insecurity

Homelessness. Homelessness is the first indicator of housing insecurity explored in the study. It is the most extreme form of housing insecurity commonly defined as not having a place to sleep at night, living in a temporary shelter, or being imminently at risk of losing shelter because of an eviction (National Health Care for the Homeless Council, Inc., 2019). Additionally, the U.S. Department of Housing and Urban Development (HUD), located in the Department of Health and Human Services (DHHS), broadened the definition of homelessness in

2012 specifically to include any qualification of homelessness that has been put forth in other federal statues[1] (HEARTH Act, 2011). This expansion now includes in the definition of homelessness families with children under 18 who frequently move (HEARTH Act, 2011). Under the new definition, families who have not held a lease or ownership of a residence within the past 60 days or families who have moved residences two or more times within a 60-day period are considered homeless (National Alliance to End Homelessness, 2012).

The exact components of policy definitions of homelessness are important because they are often the gatekeeper of eligibility into housing assistance programs and services. Policy definitions also determine who is counted as homeless, a statistic which is often used to evaluate general changes in homelessness trends and to justify related program funding allocations. The inclusion of short-term, high-frequency residential mobility of families as an indicator of homelessness acknowledges the negative impact that moving to multiple homes over a short time period, even if a family remains out of the sheltered homeless system, can have on a family's functioning and on children's development.

This study adds to the literature on the intersection of homelessness and housing insecurity by examining the number of places that a child lived during each of the first three years of life as well as by asking specific questions about experiences of sheltered and unsheltered homelessness. The specific 60-day time-period where two or more moves occurring qualifies a family as having experienced homelessness is not specifically measured in this study because distinguishing between federal definitions of homelessness and general housing

[1] The list of all federal statutes that include definitions of homelessness can be found in the Federal Register (2011). This specific reference to residential mobility can be found in amendments made in 2009 to two programs initiated under the McKinny-Vento Homelessness Act that under the Homeless Emergency Assistance and Rapid Transition to Housing Act (HEARTH).

insecurity is not the focus of this project. Rather, the overlapping timelines of children's experiences of different categories of homelessness, an extreme form of housing insecurity, with children's experiences of pediatric health care utilization is one of the primary aims of this study. The results of this study may highlight the need to define a different threshold of homelessness measured by family residential mobility patterns specifically for families with children under 3-years-old. What is known about patterns of homelessness in families and children is presented in the next section.

Homelessness and access to health care and early childhood services. Past research has shown that homeless children have higher rates of acute illnesses, higher rate of emergency department use, and more frequent acute-need outpatient pediatric visits than do case-controlled, low-income non-homeless peers (Weinreb, Goldberg, Bassuk, & Perloff, 1998). A more recent systematic review of what is known about families and children who experience homelessness confirms that patterns have remained the same over the past two decades of research – children experiencing homelessness have higher rates of emergency department use, higher rates of acute illnesses and behavioral problems, and lower rates of immunizations than do low-income children in housed settings (Grant, Gracy, Goldsmith, Shapiro, & Redlener, 2013).

Additionally, there is very little information on patterns of housing insecurity in the first three years of children's lives, that might or might not include periods of sheltered or unsheltered homelessness. There is also a dearth of literature on whether or not children who experience homelessness, or any form of housing insecurity, are being screened or referred to developmentally supportive programming such as Early Intervention in between periods of housing insecurity. The primary research questions in this study will help to fill the gaps in the

literature by discovering patterns of housing insecurity, health care utilization, and parental awareness of the Early Intervention program during the first three years of children's lives.

Residential mobility. Although the updated HEARTH Act (2011) definition of homelessness includes an extreme pattern of frequent residential mobility, there are other patterns of residential mobility that would not qualify as homelessness but are considered to be conceptualizations of housing insecurity in this study. There is common agreement that not all experiences of residential mobility are indicators of housing insecurity. To define experiences of residential mobility that are associated with housing insecurity, the following features of residential mobility must be explored: frequency, duration, timing, reasons for moving, degree of voluntariness, and the accessibility of desired housing.

Timing, frequency, and duration. There are multiple recent systematic reviews and recommendations for development of a unified conceptual definition of housing insecurity (Anderson, Leventhal, & Dupéré, 2014a; Clark, 2010; Cotton & Schwartz-Barcott, 2016; Cox et al., 2017; Kleit et al., 2016). There are various frameworks, dimensions, and patterns of housing insecurity explored among families with children and explored among adults living in neighborhoods marked by urban poverty. The most common feature in the conceptualization of housing insecurity across these reports is the acknowledgement that chronic residential moves over short periods of time is an indicator of housing instability. Researchers concur that some level in the frequency of moves over a short duration of time (indicated as anywhere between one and five years) is an indicator of housing insecurity (Anderson et al., 2014a; Clark, 2010; Cotton & Schwartz-Barcott, 2016; Cox et al., 2017; Kleit et al., 2016).

Reports differ in the strategies that they implore to predict what threshold of moves over which timeframe might indicate the presence of housing instability. Only one of the papers

discusses the timing of the move as it relates to children's specific developmental stages (Anderson et al., 2014a). Anderson and colleagues (2014a) acknowledge that the timing, duration, and frequency of residential mobility as a form of housing insecurity is complex. Determining the impacts of housing insecurity of multiple forms on children's wellbeing and development also requires the acknowledgement that children and families have varying combinations of strengths, resources, and challenges that interact over time and may serve as buffers to or amplifiers of the potential negative impacts of housing insecurity on children.

Rather than establish an a priori set of conditions whereby residential mobility becomes identifiable as a form of housing insecurity, this study simply hypothesizes that all forms of moving homes need to be explored for their potential impact on health care utilization and parental awareness of EI during the first three years of children's lives. The timing, duration, and frequency of residential moves during the youngest periods of children's lives may have different impacts on children's health care utilization which in turn may impact children's access to needed referrals for extra developmental support. This study serves as a beginning point for investigating patterns of moving as a form of housing insecurity and its potential impact on children's health care utilization and parental awareness of the Early Intervention program.

Patterns of Moving and the Push-Pull Framework. Although the timing, duration, and frequency of residential mobility as indicators of housing insecurity lack conclusive thresholds, the reasons for moves and outcomes of moves are more concretely identifiable characteristics of residential mobility that indicate the possible presence of housing insecurity. Clark's (2010) qualitative exploration of patterns of moving among families with children living in poverty in urban areas provides a helpful framework for categorizing the reasons and outcomes of each move along a spectrum of housing insecurity. Although her study takes each

move as an independent experience to be analyzed as a combination of push and pull factors, this study expands her categorization to explore the process of characterizing a three-year-period of children's lives as being marked by varying degrees of housing insecurity.

The push-pull framework referenced in Clark's (2010) study is a positivistic, neoclassical economics approach to categorizing the reasons that people move. The framework centers around looking at each move as a rational choice based on utility maximization at any given moment in time. The origin of the push-pull theory of migration can be found as early as the late 1880s in Ravenstein's "laws of migration" (Ravenstein, 1885, 1889), a list of rational-choice oriented generalizations about patterns of movement of people mostly within the boundaries of Great Britain (R. King, 2012). While the push-pull theory of migration and mobility was popular in the 1960s, it has been heavily criticized for its anti-contextual, single-move analysis orientation (R. King, 2012). Other theories evolved since that time that consider the social, political, historical, and psychological contexts surrounding decision or action of moving. These include migration theories centering on the role of social networks in shaping decision-making, the role of political and economic contexts that provide the boundaries of opportunity to move, and the role of interconnected systems with moves and how multiple moves and tandem experiences over time shapes future experiences and movement patterns (R. King, 2012).

While national and international migration studies have been coopted by a diversity of social science fields such as population geography, demography, and sociology, there is no resulting single theory of moving or migration that encompasses the complexity of the phenomena of moving nor have any provided complete frameworks for defining or quantifying housing insecurity. This project borrows from the positivistic approach to defining push-pull

factors surrounding moving as illustrated in Clark's (2010) qualitative analysis of mobility patterns of families with children living in poor urban neighborhoods.

Clark's (2010) categorization of push-pull factors was neutral in its approach. Clark did not identify push or pull factors reported by respondents as positive or negative, meaning that the push or pull factor reasons were not further evaluated as situations that had positive or negative impacts on family functioning or wellbeing. However, Clark does indicate that some of the reasons for moves have positive or negative effects on the future level of stability of families housing trajectories.

As presented in Clark's (2010) work, push factors simply have to do with reasons for moving away from the location of origin, such as those relating to experiences of domestic violence, evictions, or foreclosures, the birth of a child or marriage and moving in of a spouse that changes family size and may result in the need for more space. Pull factors include reasons for moving to the destination location. Pull factors include reasons such as moving closer to family or friends, moving closer to a job to reduce commute time or moving to a new job, or, moving to a place to be closer to another desired resource or service such as education or child care. I utilize the push-pull framework to inform the creation of the data collection interview questions exploring patterns of moving among study respondents.

Push-pull framework and experiences of social and economic adversity. There are multiple research studies that have highlighted how different reasons for moving impact children or families. The decision to look globally at the three-year period is based on developmentally contextualizing the exploration of the topics investigated in this project. Little is known about the relationship between reasons for moving and the number of moves over this developmentally sensitive period of years in children's lives.

One avenue for exploring whether patterns of moving indicate that housing is insecure is to examine if other social adversities are occurring in tandem with moving and, if they are, to consider their combined impact on children and families during a specific developmental period in children's lives. Since housing insecurity is the primary social adversity explored for its impact on access to health care visits and relationship to parental awareness of Early Intervention (EI), it is important to highlight these transactional relationships within the context what has been studied about their impacts on child and family wellbeing as well as for their impacts on family routines and access to resources.

The next sections detail what is known about the transactional nature of reasons for moving with other commonly experienced adversities in early childhood, such as economic insecurity and interpersonal violence. It is important to detail what has been studied about the transactional dynamics of these experiences in order to acknowledge the complexity of interrelated dynamics that characterize the disruption in family routines that often accompanies experiences of moving. Doing so will also shed light on reason for moving not characterized as features of housing insecurity because, although they may disrupt family routines, these reasons for moving are not associated with other forms of adversities nor have they been found to have negative impacts on child and family wellbeing. Table 1 summarizes the characteristics of the reasons for moving utilized in this study based on Clark (2010) push and pull framework and based on the subsequent discussion highlighting what is known about the timing and impact of reasons for moves on child and family wellbeing.

Table 1. Push-pull framework categorization of reasons for moving

	Category	Net Negative Impact	Immediacy
Push Reasons			
Being forced to move out due to the threat or due to an actual eviction or foreclosure	Economic	Yes	Yes
Not being able to afford the rent or the mortgage where you were living	Economic	Yes	Yes
Moving away from domestic abuse	Imminent Harm	Yes	Yes
Moving away from a household that had a lot of arguments or tension between household members	Relationship	Yes	Yes
Being forced to move due to a fire	Imminent Harm	Yes	Yes
Moving away from things that made the neighborhood unsafe (crime, drugs, bad neighbors, etc.)	Neighborhood	Yes	Yes
Moving away from a relationship breakup, a divorce, or a separation	Relationship	No	No
Moving to an apartment with more space due to the birth of a new child	Relationship	No	No
Moving away from an apartment or house that had physical problems (bed bugs, water damage/mold, broken windows, or walls)	Structural	Yes	Yes
Moving away from a crowded living situation where there was more than 2 adults in a bedroom	Structural	Yes	Yes
Moving because where you were living was being sold	Economic	Yes	Yes
Pull Reasons			
Moving because of purchasing a home	Economic	No	No
Moving to be closer to family or friends	Relationship	No	No
Moving to live with a partner, boyfriend, or spouse	Relationship	No	No
Moving to a neighborhood that is closer to a job, public transportation, child care, a school, or college	Neighborhood	No	No
Moving to have your own independent space	Relationship	No	No

Evictions and foreclosures. Evictions and foreclosures are reasons for moving that occur among families with a lack of financial resources. Commonly, push factors, such as foreclosures or evictions, experienced by low-income families are involuntary, urgent situations (Skobba, 2016; Vásquez-Vera et al., 2017). Having been forced to move due to foreclosures and evictions has been found to increase the likelihood of future moves due to the immediacy of the move and necessity to accept available housing options even if they are sub-standard (Desmond, Gershenson, & Kiviat, 2015). A systematic review of the threat of home eviction found negative impacts across the board and commented that most studies examined mental health effects (55%), some examined physical health effects (38%), and still others explored impacts on other health related behaviors (19%) in a variety of populations (Vásquez-Vera et al., 2017).

Evictions experienced by renters also have been found to put individuals and families at risk for future homelessness and long-term poor health, and, the consequences of evictions are interconnected with prior histories of housing insecurity, chronic joblessness, and lack of affordability of available housing (McDonald, 2011). Foreclosures have negative impacts not only on family functioning and psychological wellbeing. They also decrease nearby property values which over time can destabilize the economic wellbeing of entire neighborhoods (Kingsley, Smith, & Price, 2009). These reasons for moving are evaluated as having a net negative impact on children and family wellbeing during the first three years of life and beyond.

Experiences of domestic violence and abuse. Experiences of imminent danger, such as due to domestic violence or abuse in the home, are reasons for moving that negatively impact children's wellbeing. In this case, the negative impacts on children are due to the tandem known impacts of trauma related to witnessing or experiencing domestic abuse (Middlebrooks & Audage, 2008) and the negative impacts caused by the disruption and upending of the physical

housing environment (Anderson et al., 2014a; Mayberry et al., 2014). Although moving away from situations of domestic violence and abuse is a positive action, ultimately providing children with safer environments even if that means children experience temporary sheltered homelessness, the harmful consequences of domestic violence and unpredictable timeframe in which a parent needs to leave one house and find other suitable housing has short-term, negative impacts on children and their caregivers.

Changes in family structure. Residential mobility due to changes in family structure, such as the birth of a child and desire for more space, marriage, or co-habitation of partners that are generally purposeful and planned have net positive impacts on families and children (Clark, 2010). The assignment of changes in family structure as push or pull are irrelevant. What matters is the assignment of these changes in family structure as reasons for moving that have net positive impacts on family and children's wellbeing. For example, the birth of a child would be considered a push-factor as it involves a change or upcoming change in the ability of the location of origin to meet the needs of the family living in it. However, changes such as marriage or co-habitation, could be push or pull factors depending on the timing of the change in relationship status with the residential move. Often, literature considers these moves as "pull-factors" if one or both partners are pulled from their housing of origin into a new or merged housing situation (Clark, 2010).

Other changes in family structure related to moving have a less clear delineation as having net positive or negative effects on children and families. For example, partnership dissolution due to formal or informal divorce, break-up, or separation between two romantically engaged people who live together is a push-factor reason for residential mobility (Clark, 2010). However, while most studies consider the act of one or both partners moving to new, different

residences because of a breakup, separation, or divorce as a negative experience, the move may or may not have a negative impact on a person's wellbeing. Factors related to relationship changes that are not associated with incidences of domestic violence are considered to have an ambiguous impact on child and family wellbeing.

Moving closer to family ties, resources, or other desired opportunities. Additionally, the desire to move closer to social ties, such as friends or family that might provide relational or material support (Skobba & Goetz, 2013), along with the desire to move closer to a job, school program, child care center or service, or other desired resource are all considered pull-factors. Generally, moves surrounding these factors are regarded as having net positive influences on children and family wellbeing (Clark, 2010).

Changes in employment or health status. A qualitative study of mobility patterns of low-income families with children found that moving was also deeply interconnected with economic losses or gains (Clark, 2010). Some of the aforementioned reasons for moving, for example job loss, health problems resulting in loss of pay, or unexpected expenditures due to health crises may result in a family's inability to pay housing costs. This, in turn, if not remedied, could result in the initiation of foreclosure or eviction processes. Additionally, ending a relationship and moving away from a partner who may have been the primary income earner could throw the secondary-income earning partner into financial instability with a lack of means to pay for sufficient housing. Many reasons for moving interconnected with economic insecurity are push factors often occurring alongside an urgent need to move to find more affordable housing options (Clark, 2010).

The interconnectedness of reasons for moving and health or employment status are also exemplified by situations that illustrate a family's access to resources and thus wider housing

choice possibilities. Families who have accumulated sufficient economic means and have access to relatively stable economic stability through the primary earners job status may decide to move in order to own their own home, or, to own a larger home. Families with enough economic means also can move on their own volition in the acquisition of higher paying jobs, better neighborhoods, or to be closer to an amenity of their choosing (Clark, 2010). Families with economic security intact are often motivated to move based on reasons related to the destination of choice—pull reasons for moving (Clark, 2010).

Accessibility of desired housing. In addition to homelessness and some experiences of residential mobility, there are other features of housing insecurity that deserve mention. Past studies on residential mobility in low-income, urban families examine housing instability as the lack of access to adequate housing (Coley et al., 2014). Accessibility can be thought of along two dimensions, affordability and availability of financial support and housing stock in desirable locations. Accessibility of housing and reasons for moves are interlinked. However, rather than acting as a decision-making factor to be prioritized, the accessibility of desired housing sets the limits of opportunity available to a family desiring to move, regardless of specific reasons (Coley et al., 2014; Sampson & Sharkey, 2008).

Availability of housing and housing choices are also interconnected with patterns of racially homogenous neighborhoods that are a common characteristic of most urban cities in the U.S. Sampson and Sharkey (2008) compiled seven years of residential mobility data among approximately 4,000 Chicago families showing that poverty, residential mobility, churning, and opportunity vary significantly not only because of a person's income levels but rather are intimately connected to racial segregation and the limited social networks available to help poor minority families expand their opportunities.

Notably, poor families are often caught in a pattern of moving frequently from one poor neighborhood to another in a pattern called "churning" (Coulton, Theodos, & Turner, 2009). Coulton and colleagues found that while poor families may desire moving to improve their circumstances, they often are limited by a lack of economic resources that prevents them from moving to better circumstances. Additionally, children who experience residential mobility due to the threat of evictions or foreclosures are often on an inescapable path of insufficient economic and social network resources leading to periods of homelessness and recurrent, involuntary residential moves (Clark, 2010; Cutts et al., 2011; Kingsley et al., 2009; McDonald, 2011). The overall impact of a move on a child's life and the loss in physical and social resources is directly related to the tandem experience of patterns of economic insecurity and housing changes.

While important, churning and lack of availability of affordable housing are components of housing insecurity not addressed in this study due to restrictions in access to census tract characteristics of geographic location data. However, an exploration of housing accessibility and patterns of moving among families with young children for its connection with neighborhood racial composition, neighborhood economic characteristics, and density of available health care centers serving children is an additional pathway of exploration foreshadowing well-child attendance rates and likelihood of parental awareness of EI.

Other Forms of Housing Insecurity – Lack of Affordability and Crowdedness. Other forms of housing insecurity studied in the literature include lack of affordability of current housing, or, paying more than 30% of one's income for housing, lack of structural quality, or living in a home with mold, broken windows, or related structural damage, and crowdedness, measured by having more than two adults sleeping in the same bedroom. These characteristics reflect the

interconnectedness of experiencing a lack of financial resources along with these specific indicators of housing insecurity whereby a family still has a home but is on the verge of homelessness or losing a home. A recent study of the health of caregivers and children in families who rent their dwellings found that financial strain noted by an inability to pay rent is associated with poor health outcomes independently from histories of multiple residential moves or periods of homelessness (Sandel et al., 2018).

However, lack of affordability may also occur in tandem with histories of multiple moves and overcrowded conditions which together are associated with negative health outcomes in children. Overcrowded conditions and multiple moves experienced by very young, poor children are associated with higher developmental risk, low body weight, and fair or poor child health when compared with securely housed peers (Cutts et al., 2011).

Additionally, there are other possible impacts of tandem and independent experiences of lack of affordability and over crowdedness on children's access to health care. Access to functional resources used to engage with medical services may be lost or disrupted by the experience of housing insecurity characterized by a lack of affordability of housing. Functional resources may include things such as access to a car or nearby bus stop for transportation, or, access to child care for older or younger siblings provided by residents of the shared space in doubled-up living conditions, for example. The loss of transportation or child care specifically linked to interlinked experiences of economic insecurity, lack of affordability of housing, and over crowdedness due to doubling-up a may be one pathway through which poor children experiencing housing insecurity become less likely to utilize health care services. The next section details how loss of these functional resources may be connected with housing insecurity and may directly impact a family's ability to attend medical visits for their children.

Transactional dynamics of economic insecurity, lack of housing affordability, homelessness, residential mobility, crowdedness, and changes in access to resources. The indicators of housing insecurity that involve moving, namely homelessness and residential mobility, may also be associated with disruptions in access to functional resources that may be needed to attend pediatric medical appointments or to follow up on communications with providers. While most studies of the impacts of housing insecurity and tandem experiences of poverty involve evaluating their associations with children's health or developmental outcomes, this study offers an exploration of these social determinants of health on children's access to health care. A feature of this study is the inclusion of questions about the connection between housing insecurity, gaps in access to functional resources, and medical visit attendance in children during the first three years of life. Chapter Four, on the study conceptual framework, describes the details of the connection between the specific indicators of housing insecurity explored in this project, gaps in access to functional resources, and possible impacts on medical visit attendance.

Housing Insecurity Conceptualization Summary

This project will use a definition of housing insecurity that separately explores the association of various indicators of housing insecurity on health care utilization and parental awareness of the Early Intervention Program. The specific dimensions that will be separately explored are a continuous and discrete measurement of patterns of homes lived in and patterns of moving, experiences of homelessness and crowdedness, and rent or mortgage affordability. The study methodology for capturing information about these experiences and the analytical techniques used to explore their association with health care utilization and parental awareness of Early Intervention will be presented in Chapters Five and Six respectively. The next chapter

details how the intersections among housing insecurity, utilization of health care, and parental awareness of the Early Intervention program are explored in this project using a social determinant of health and health equity framework.

Chapter Three – Background Literature on Housing Insecurity as a Social Determinant of Health

In the prior chapter, I discussed the ambiguities and complexities of the term "housing insecurity" and situated the way that I define and limit the use of the term in this project. In this chapter, I further contextualize housing insecurity as a social determinant of health and present a traditional application of the social determinants of health (SDH) framework utilizing an extreme form of housing insecurity, namely homelessness. The application of SDH to health care utilization and parental awareness of the Early Intervention program in this project will be presented in Chapter Four.

Social Determinants of Health Framework

Social adversities and their relationship to health outcomes are commonly studied as social determinants of health. "Social" in the term "social determinants of health" refer broadly to any non-medical factors that influence a person's health (Braveman et al., 2011). Social factors may include environmental contexts like socioeconomic status, educational attainment, stability of social and familial relationships, occupation, or neighborhood qualities. They also may include individual characteristics such as a person's beliefs, attitudes, knowledge, and health behaviors (Braveman et al., 2011).

Experts in child development assert that social adversities impacting development are best addressed as early as possible in children's lives (National Scientific Council on the Developing Child, 2007; Pascoe et al., 2016; Shonkoff & Phillips, 2004). The relationship of

social adversities to health outcomes has also evolved to include explorations of SDH in the context of life course theory to highlight factors that promote resiliency in the face of adversity (Braveman, 2014). However, pathways linking various social determinants and health outcomes is complex and multidimensional (Pascoe et al., 2016; Thornton et al., 2016).

Housing insecurity is viewed as a social determinant of health throughout this project. Braveman and colleagues (2011) describe the metaphor of a river with upstream and downstream factors that is widely used to illustrate the complicated and interconnected components that link social factors and experiences with health outcomes. Upstream factors can also be described as factors that have distal associations with the outcome being examined. Downstream factors can also be described as factors having a more proximal relationship to the outcome being examined. The distal factors are social forces or experiences. Proximal factors, impacted by these upstream, distal factors, are processes or characteristics more closely and causally linked to the outcome being investigated.

Central to this study is the conceptualization of housing insecurity, in its various forms, as a distal (or upstream) social factor that impacts various components of children's short-term or long-term health outcomes. A classic utilization of the upstream-downstream metaphor illustrates the general pathways and hypothesized interdependencies among upstream factors, like housing insecurity, and downstream factors, such as increases in parental or child stress levels, proximal factors which more closely influence children's health outcomes.

A traditional application of the social determinants of health theory examines these interdependencies and provides hypothesized multidimensional and often multidirectional explanatory pathways for the associations between various social factors and negative health outcomes. Although the purpose of this project is to illustrate the connection between housing

insecurity, health care utilization, and parental awareness of the Early Intervention program, it is first necessary to understand how a SDH framework would traditionally be utilized in exploring the connection between social factors and health outcomes.

In a traditional SDH approach, housing insecurity is viewed as an upstream, or distal,

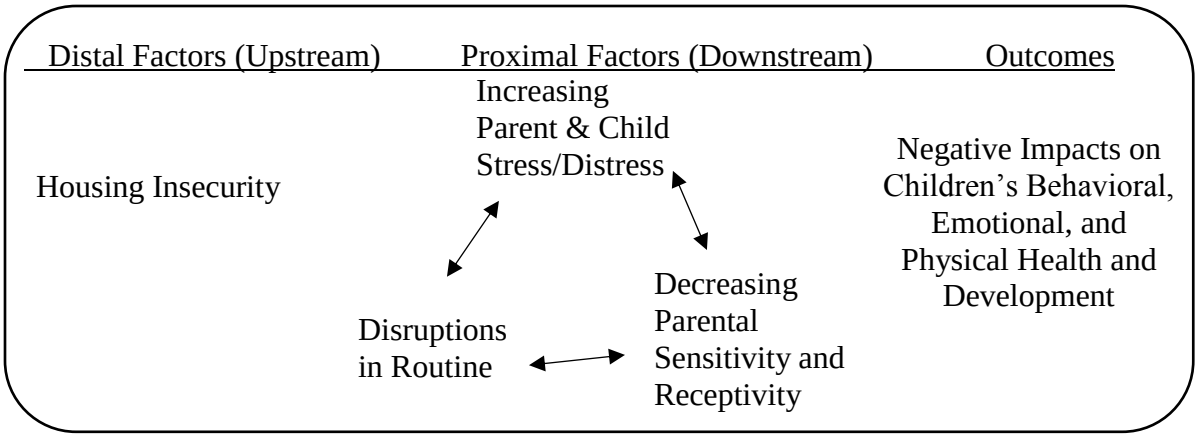

Figure 2. Examining housing insecurity using an SDH framework.

social factor that impacts children's health outcomes. Figure 2 illustrates a hypothesized pathway of distal and proximal factors that show the association between housing insecurity and various health outcomes in children. Housing insecurity is shown as a distal factor that is associated with increases in parental stress (Clark, 2010), disruption in daily routines (Mayberry et al., 2014), and increases in children's stress (Pascoe et al., 2016). All of these are interrelated downstream features of experiences of housing insecurity that are more closely linked to children's health outcomes than are the upstream experiences of housing insecurity in isolation. Proximal factors are experiences or states of being that are directly associated with changes in health status. Distal factors are things that impact or change downstream factors but not the health condition directly, per say.

However, as presented in the prior chapter, housing insecurity is a term encompassing a wide range of experiences of housing quality and housing changes over time. The pathways of hypothesized impact may look different depending on the context of the experience of housing

insecurity present in a child's life. As supported by literature examining these pathways, different forms of housing insecurity are associated with children's health outcomes through similar yet distinct upstream and downstream factor interrelationships (Sandel et al., 2018; Skobba, 2016). In order to clearly illustrate a set of pathways and interdependencies connecting a more specific form of housing insecurity and children's health outcomes, it is helpful to examine the association between an extreme form of housing insecurity, homelessness, and children's health outcomes. The next section discusses what is known about the association between experiences of homelessness and children's health outcomes using a social determinants of health framework.

Using Social Determinant of Health to Understand Homelessness and Child Health Outcomes

This section explores the pathways through which homelessness directly and indirectly impacts children's health and development. The upstream and downstream factors shown in Figure 2 adequately illustrate possible connections between homelessness and children's health outcomes. Chronic and temporary homelessness in the youngest of children has been found to be associated with developmental delays, difficulty regulating emotions, behavioral problems (Bassuk, Murphy, Thompson Coupe, Kenney, & Beach, 2011), and poor educational performance (Coker et al., 2009).

Additionally, homelessness (upstream factor) has been found to negatively impact the child-rearing environment (downstream factor) due to increased parental stress (downstream factor), increased fear of child protective services involvement (downstream factor) (Lea, 2006), and interruptions in daily routines (downstream factor) (Mayberry et al., 2014). The negative impacts of sheltered homelessness on parental mental health (downstream factor) and parental

self-efficacy (downstream factor) negatively impacts children's adjustment due to the decrease in parental sensitivity and receptivity to children's needs (downstream factors) that coincides with disruptions in family functioning (Gewirtz, DeGarmo, Plowman, August, & Realmuto, 2009).

The aforementioned downstream factors are interrelated and multidirectional. There are further downstream factors not included in Figure 2 that are even more closely tied to children's health outcomes. For example, chronic periods of homelessness and related exposure to other adverse circumstances that may often accompany periods of homelessness, such as exposure to domestic violence or food insecurity, are associated with developmental delays and mental health crises in the youngest of children (Grant et al., 2013). The hypothesized relationship between these adversities and negative health outcomes includes children's exposure to prolonged periods of toxic levels of stress incited by multiple stressors (National Scientific Council on the Developing Child, 2014). Exposure to prolonged periods of toxic stress has been shown to negatively impact children's emotional regulation, immune system functioning, and parts of the brain responsible for memory and learning (Middlebrooks & Audage, 2008; National Scientific Council on the Developing Child, 2014).

Although this study does not focus on the relationship between housing insecurity and children's health or developmental outcomes, acknowledging how the SDH framework can be utilized to illustrate a relationship between housing insecurity and children's health outcomes is foundational to the analysis of related themes in this study. This study adds to the literature on both homelessness and housing insecurity in families with young children by recognizing the complexity of factors that influence children's development and by bringing awareness to a sample of families' unique patterns of housing status changes during an important and understudied period of children's developmental growth. The next section addresses the

interconnectedness between housing insecurity and other social adversities that often occur in tandem.

Interconnectedness of Housing Insecurity and Other Social Adversities

Studies have shown that other social determinants of health, such as food insecurity or economic insecurity, often occur in tandem with housing insecurity in low-income families. Residential mobility experienced by children living in poverty is often identifiable as a feature of housing insecurity when moving is associated with the direct experience of periods of chaos and disruption in the child's schedule and the indirect experience of periods of disruption in the psychological and physical resources available to the child from adults in the child's proximal environment (Clark, 2010; David, Gelberg, & Suchman, 2012).

The relationship between economic insecurity, not having enough funds to pay for basic needs, and residential mobility as a form of housing insecurity is non-linear and multidimensional (Clark, 2010; Pascoe et al., 2016). For some families, economic insecurity arises due to job loss or due to expenses associated with an acute health crisis. Economic insecurity for these families might result in not having enough money to pay for rent or mortgage and thus initiates a period of tandem housing insecurity. For other families, substandard housing may result in the need for costly repairs or maintenance which forces families into a period of foreclosure or eviction due to the costs or inability to pay for or fight for needed services (Clark, 2010; Mayberry et al., 2014).

Economic insecurity is an additional social adversity often experienced in tandem with residential mobility. The specific conceptualization and rationale for asserting the primacy of housing insecurity in relationship to economic insecurity was presented in Chapter Two through

applying a push-pull framework to conceptualizing the transactional dynamics among multiple types of adversities that characterize different reasons for moving.

Pertinent to understanding a traditional application of the SDH framework, an additional example of the interaction between housing insecurity and economic insecurity highlights the complexity of their interrelationship. For instance, multiple moves may be caused by a lack of financial security which results in the initiation of the process of evictions or foreclosures. Multiple moves may also be associated with the lack of availability of safe and affordable housing in a desired geographic area. Additionally, financial insecurity may be the result of chronic joblessness making the acquisition of financial resources needed to pay for rent difficult to stabilize. The lack of income may force a family to face chronic moves as the family doubles up with others who are willing to house them for free for unknown durations of time. These reasons for moving and the incidents of multiple moves may indirectly impact a child's health and development through the increases in caregiver distress that may negatively impact the caregiver's receptivity to the child's health or developmental needs this increasing children's levels of distress (Cutts et al., 2011; Kingsley et al., 2009; Marcal & Fowler, 2015).

Additionally, downstream factors may have bidirectional relationships with one another and bidirectional relationships with health outcomes. For example, parental stress may increase with experiences of housing insecurity which in turn may reduce parental receptivity to their child's needs as well increase young children's stress levels. Simultaneously, children's stress levels may increase due to disruptions in daily routines caused by various forms of housing insecurity such as homelessness or residential moves. Increases in children's stress may express themselves as emotional or behavioral problems which in turn may increase parental stress

levels. If the level of children's stress is considered toxic and remains at high levels over prolonged periods of time, multiple components of children's neurobiological health may suffer.

The National Scientific Council on the Developing Child (NSCDC) updated a working paper in 2014 on how excessive stress impacts a child's developing brain. The neurobiological mechanisms reported are examples of downstream processes that are most directly associated with children's health outcomes:

> Sustained or frequent activation of the hormonal systems that respond to stress can have serious developmental consequences, some of which may last well past the time of stress exposure. When children experience toxic stress, their cortisol levels remain elevated for prolonged periods of time. Both animal and human studies show that long-term elevations in cortisol levels can alter the function of a number of neural systems, suppress the immune response, and even change the architecture of regions in the brain that are essential for learning and memory (National Scientific Council on the Developing Child, 2014, p. 3).

Additionally, the report asserts that each child's response in stress-inducing situations is complex and unique. Not all children respond in the same way to similar stressors. Children also have different combinations of experiences, relationships, and personal characteristics that may serve to buffer the severity of negative outcomes of prolonged stress exposure (National Scientific Council on the Developing Child, 2014).

Serving as the focus of this study, access to preventative medical care and referrals to developmentally enriching services, such as the Early Intervention program, may serve to buffer the severity of the negative outcomes of prolonged stress exposure (Rushton & Kraft, 2013). Given all that is known and has been hypothesized about the downstream biological mechanisms connecting upstream social adversities with children's health outcomes, it is even more important to explore what may be preventing children from engaging with preventative health care and developmentally promotive services. The next section describes the role that pediatric

preventative care and specific referrals to the Early Intervention program plays in mitigating negative health outcomes among the most vulnerable of children. What is known about barriers to participation in pediatric preventative medical care and barriers to recruitment into the Early Intervention program is presented and critiqued in the next section for its narrow reliance on cognitive and psychological decision-making theories used to understand parental attitude, belief, and behaviors related to enrollment in voluntary services for their children.

Health Care Utilization and Referrals to the Early Intervention Program

Families receive information about developmentally supportive programs and services through multiple avenues, such as daycare providers, county assistance offices, or pediatric medical provider offices. One common source of referral to the Early Intervention program for low-income families that deserves mention but is not explored in this study is through the Early Head Start program. Early Head Start is an income-based eligibility program free-of-charge for participants that is designed to mitigate some of the negative impacts of direct and indirect toxic stress on families with young children. The Early Head Start program routinely conducts developmental screening and surveillance for all enrolled children within 45 days of the start of the program. Children with developmental delays enrolled in Early Head Start are more likely to be identified and referred to the Early Intervention program than are those who are not enrolled in Early Head Start (Wall et al., 2005).

However, not all families who may be eligible for Early Head Start can be served by the program due to the limitations of program staff, building size, and funding sources. Pediatric well-child visits serve as one of the primary entry points for accessing a referral to the Early Intervention program regardless of a child's household income. The American Academy of Pediatrics (AAP) issued guidelines in 2006 on the timing and rigor of developmental screenings

to be administered during pediatric well-child visits at four specific timepoints prior to a child's third birthday. The policy statement recommends that all children receive developmental screenings using validated tools at the 9-month, 18-month, either the 24 or 30-month, and the 36-month well-child pediatric visits (American Academy of Pediatrics, 2006).

The AAP also established a well-child visits and immunizations schedule that includes six more recommended visits prior to 9-months of age. Although formal developmental screenings are not required at these timepoints, they are additional points of contact between providers and families with newborns where informal assessments of the child's wellbeing and development, termed developmental surveillance, are made (American Academy of Pediatrics, 2019). However, children who are poor and experience housing insecurity face the reduced likelihood of engagement with outpatient health care services (Briggs, 2013; Cutts et al., 2011; Jelleyman & Spencer, 2008).

Among children who do attend pediatric visits, studies have found that rates of formal developmental screening in participating pediatric practices increased while utilization rates of Early Intervention programs remained surprisingly unchanged (Bethell, Reuland, Schor, Abrahms, & Halfon, 2011; T. M. King et al., 2010; Schonwald, Huntington, Chan, Risko, & Bridgemohan, 2009). The connection between developmental screening rates in pediatric settings, follow-up procedures, and EI utilization outcomes are difficult to track due to barriers blocking the sharing of information about patients and barriers in identifying which agencies should carry the responsibility of tracking this information across multiple agency sites. Some of the lack of change in EI utilization rates may also be due to state-specific, restrictive eligibility requirements (Rosenberg, Robinson, Shaw, & Ellison, 2013) and a lack of sufficiently trained providers to serve the population in need (Grant & Isakson, 2011; McManus et al., 2014).

Others note that EI underutilization may be the result of a lack of clear communication and understanding between parents and medical providers about the developmental screening process and results (Houle, Besnard, Bérubé, & Dagenais, 2018). Additionally, the burden of understanding developmental screening results given in pediatric settings and initiating the complex follow-up process is often entirely placed on the parent to coordinate (Marshall, Adelman, Kesten, Natale, & Elbaum, 2017). These factors associated with the post-referral process and the parent-provider relationship and communication dynamics may result in parents disengaging with Early Intervention referral and eligibility process although their children may stand to benefit from EI utilization.

To address the diverse body of research evidencing negative impacts of social determinants on children's health and the importance of connecting children developmentally supportive service as early as possible, the American Academy of Pediatrics (AAP) proposed the formation of medical homes in 1992 that was reaffirmed and further defined in a policy statement in 2002 (American Academy of Pediatrics, 2002). Medical homes are outpatient primary care offices that have ascribed to meet specific a specific set of values and principles designed to recognize the importance of medical care in mitigating the negative impacts of social adversities on health outcomes (American Academy of Pediatrics, 2002).

Specific to this project, pediatric primary care offices that ascribe to the medical home principles engage in processes to enhance the continuity of care experienced by patients that they serve (American Academy of Pediatrics, 2002). Continuity of care is one component of medical homes shown to increase patient understanding and trust in their communications with providers (Palfrey et al., 2004). Although there are other components of medical homes designed to address children's health through addressing environmental needs outside of the medical office,

continuity of care is investigated in this project for its possible impacts in mitigating the relationship between housing insecurity and parental awareness of EI.

The benefits of having medical homes have been widely studied. Children with complex medical conditions who have medical home have been shown to have improved health outcomes and less use of emergency rooms for urgent care (Cooley, McAllister, Sherrieb, & Kuhlthau, 2009). Despite what is known about the benefits of continuity of care in pediatric medical homes, due to the way that information on the social determinants of health is collected in pediatric settings, we do not know the frequency, intensity, or duration of tandem housing and economic insecurities that children receiving preventative care may be experiencing. Those experiencing higher intensity, frequency, or durations of housing insecurity may be at risk for the disruption of continuity of care in pediatric settings if housing and economic insecurity includes frequent household moves or gaps in access to functional resources that help the caregiver and child attend visits at the prior pediatric medical offices.

Additionally, children growing up in low-income households are more likely to miss well-child visit pediatric appointments and associated routine developmental screenings, a primary point of referral to Early Intervention and related programs (Jones, Brown, Widener, Sucharew, & Beck, 2016; Samuels et al., 2015). However, low-income children who do experience continuity of care at a medical home setting are more likely to have improved health care outcomes and access to programs that support stable housing, access to food, and access to financial support (Cooley et al., 2009). Despite awareness that pediatric medical homes and continuity of care result in better health care outcomes for children, it is not known if continuity of care is also associated with a higher likelihood of EI awareness and engagement. It is also not

known whether continuity of care mediates the impact that housing insecurity may have on caregivers' likelihood of being aware of Early Intervention.

Prior research on parental barriers to engagement with services for children. Past research focuses heavily on the psychological constructs (stress, mental health symptoms, distrust of authority figures, decision-making processes) associated with attrition or low enrollment rates into non-mandated programs or services for young children (McCurdy & Daro, 2001; Spieker, Solchany, McKenna, DeKlyen, & Barnard, 2000). Some do not present a theoretical approach but rather examine only parental and child socioeconomic and demographic factors associated with missed visits or lack of participation (Atkins et al., 2017; Kuo et al., 2015). These approaches are important and distinct from the examination of barriers to engagement or participation in services for children undertaken in this project.

This project takes a different approach in examining the connection between social adversities and gaps in EI participation rates. This study looks at functional resource gaps as a specific downstream factor that may also be proximally associated with missed medical visits. Furthermore, this study examines if these functional resource gaps are related in any way to the primary upstream factor in question, namely patterns of housing insecurity. Additionally, this study does incorporate parental concern about their children's development as a control variable in the study in acknowledgement that parental attitudes and beliefs are crucial components of their decision-making processes regarding children's participation in services.

In the next chapter, the specific conceptual framework supporting my investigation is presented. Specifically, I explain the importance of adding a health equity lens to my proposed adaptation of the social determinants of health framework. Racial disparities must also be looked at within the adapted social determinants approach. Examining the sample for racial

disparities acknowledges that achieving health equity is the overarching value underlying my investigation of the relationship between housing insecurity, health care utilization patterns, parental awareness of the Early Intervention program in the study sample.

Chapter Four – Study Conceptual Framework

As stated in prior chapters, experts in child development assert that intervening to mitigate the negative impacts of adversity as early as possible in children's lives is important (National Scientific Council on the Developing Child, 2014; Pascoe et al., 2016; Shonkoff & Phillips, 2004). Low-income children are more likely to experience social adversities early in life that may impact their health and development (Cutts et al., 2011; Pascoe et al., 2016) as well as access to health care services (Jones et al., 2016; Samuels et al., 2015). Additionally, African American children are more likely to be born into poverty than their peers in Monroe County, NY where this investigation takes place (Doherty, 2013). African American children are also known to more likely be born prematurely or with low-birth rate, regardless of financial status at birth, that puts them at risk for developmental delays or disabilities (Lu & Halfon, 2003; Zhao et al., 2015). Lastly, low-income children of all races have been found to be underrepresented in participating and having received a referral to the Early Intervention program—a program designed to promote health development and mitigate the potentially negative impact of social adversities (Clements et al., 2008; Tang et al., 2012; Wang et al., 2009). These research findings reflect the complex issues underlying my exploration of the relationship between housing insecurity, health care utilization patterns, and parental awareness of the Early Intervention program.

In the sections that follow, I present the study conceptual framework and illustrate the link between the theoretical and conceptual dimensions of this research project. In the first section of this chapter, I discuss the social determinants of health framework (SDH) and expand upon the river metaphor to include an examination of pre-Early Intervention program engagement processes that occur in pediatric health care settings. The second section describes

the way that the social determinants of health framework is merged with a health equity lens in this project. I explore the connections between the social determinants of health and health equity by highlighting how racially disparate concentrations of poverty, housing insecurity, and racial disparities in health outcomes are inseparable features of the upstream and downstream factors interacting within the social determinants of health care utilization framework. Housing insecurity patterns and their associations with health care utilization must be explored in tandem with the examination of racial disparities in birth health status and parental awareness of the Early Intervention program in order to bring awareness to specific pathways through which to promote health equity for all children.

Early Intervention Pre-Program Engagement Processes

Ultimately, the traditional upstream-downstream metaphor of the social determinants of health lens presented in Chapter Three offers a way to contextualize how non-medical factors impact health outcomes in multidirectional, complex ways. Relatedly, Anderson and colleagues (2014a) offer a description of multiple contexts that children are directly engaged with that serve as intermediary pathways between the experience of residential moves and outcomes related to children's wellbeing. Changes in the child's family, neighborhood, peer group, and school contexts are the underlying settings through which housing insecurity in the form of residential moves may impact children's outcomes (Anderson et al., 2014a). Although Anderson and colleagues do not use the upstream and downstream metaphor in their theorization of the pathways of impact of residential mobility on children's health, their examples illustrate various intermediary settings and factors, such as between the upstream factor of housing insecurity and the more downstream factors of lost social or peer relationships, that impact children's health and wellbeing.

My project recognizes the importance of this effort and is designed to further support the cross-examination of patterns of housing insecurity on changes that might also occur in an additional context, health care settings. Furthermore, since young children are unable to act on their own behalf, understanding settings and processes impacting their parent or guardian's access to knowledge, resources, and services relating to their child's development is a central feature in theorizing how upstream and downstream factors might impact the youngest children's lives.

A related assertion of SDH proponents is that no matter how much consideration is given to alleviating downstream factors, if upstream factors remain consistent, the health outcomes may not improve (Braveman, 2014; Braveman et al., 2011). The intention of this study is to use the upstream-downstream metaphor of the social determinants of health model to explore whether there are parallel complexities in pre-enrollment processes to the Early Intervention program influenced by upstream social factors occurring during the first three years of life.

The research questions in this study are designed to explore processes that occur between parents and medical providers in health care settings that precede actual engagement with the Early Intervention program. Specifically, Figure 3 adapts a traditional SDH framework to illustrate how housing insecurity is an upstream factor that may disrupt access to functional

resources and routines that may then impact further downstream health care utilization patterns, namely, well-child visit attendance and outpatient continuity of care.

It is these pre-program engagement processes, specifically taking place at outpatient well-child visits, which this study claims are downstream factors for a parallel process that also

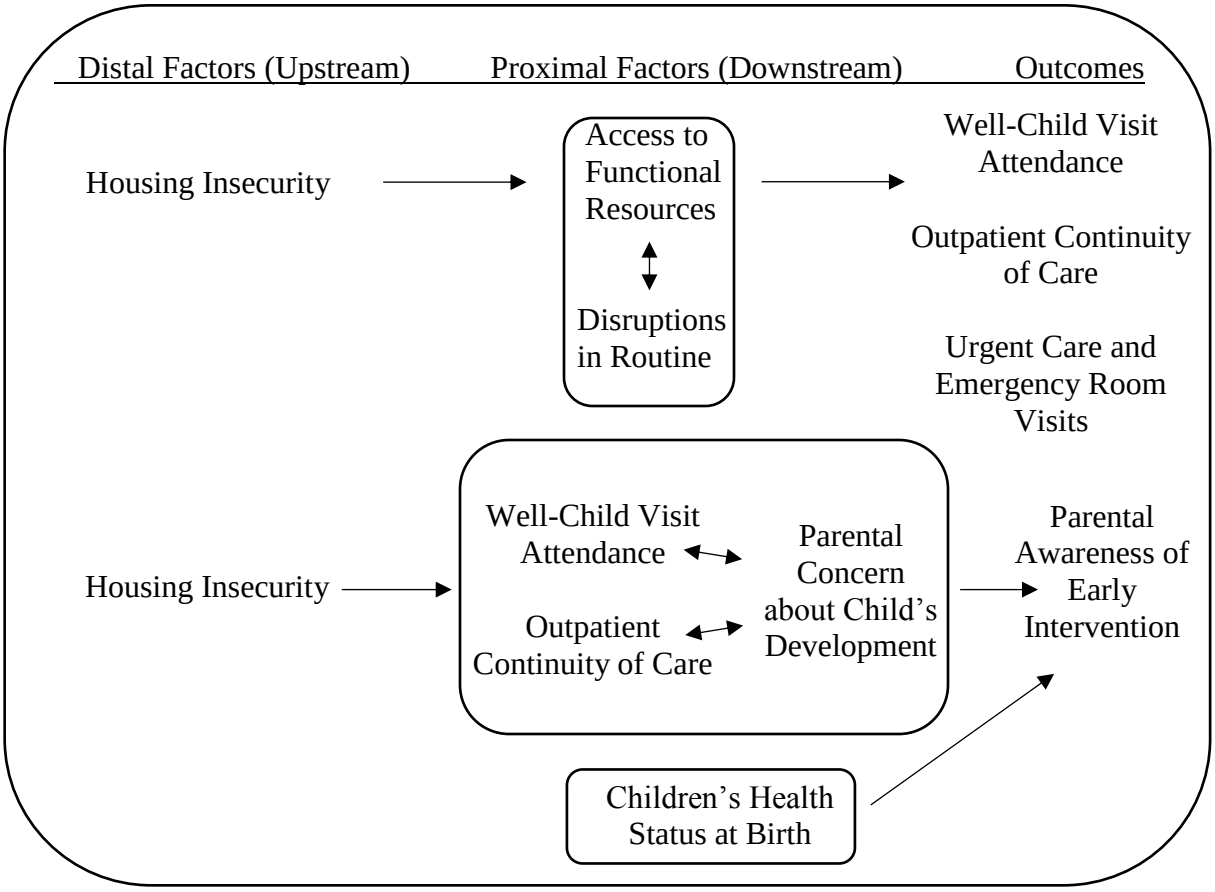

Figure 3. Using SDH to connect housing insecurity, health care utilization, and parental awareness of Early Intervention

connects housing insecurity and parental awareness of the Early Intervention program. Simply utilizing one set of upstream and downstream factors to understand disparities in who is being served by the Early Intervention program may leave out important processes occurring distinctly in each SDH pathway. I propose that there are two separate and interrelated sets of downstream factors that are both directly influenced by housing insecurity. Each set of downstream factors have specific, proximal impacts on the outcomes they are linked with.

For example, in traditional causal studies of factors that are associated with understanding how social adversities may impact family participation in routine health care or related developmental services, housing insecurity may be hypothesized to be linked to program utilization rates based on proximal factors such as psychological stress and related disorganization that can accompany the process of prioritizing basic needs (McCurdy & Daro, 2001).

However, this understanding of the relationship of social adversities like housing insecurity to family functioning and health care service engagement centralizes the association on parental psychological constructs without acknowledging the complexity of the transactional interactions at play in hypothesizing about the pathways of relationships among parental stress, parental concern for their child's wellbeing, and parental prioritization of needs and actions. For example, the same social adversities causing parental stress levels to rise may also create gaps in access to basic functional resources needed to attend pediatric well-child health care services, regardless of the level of parental concern and prioritization of their child's health care needs. In other words, a parent may be experiencing increased psychological stress due to housing insecurity along with concern about their child's development resulting in a desire to bring their child to the medical visit. However, the limiting factor is not parental stress or psychological distress but rather a lack of access to transportation or child care that may accompany a recent change in housing or loss of economic resources.

Pediatric well-child visits are a key setting where children's development and health are assessed. The assessment process is a key timepoint where information about developmental milestones and supportive services like the Early Information program are given to parents. Psychological stress may not be the primary causal or downstream factor dictating a parent's

ability to access health care for their children when facing social adversities like housing insecurity and poverty. As illustrated in Figure 3, I hypothesize that there are two interrelated upstream-downstream processes showing the relationship between housing insecurity, health care utilization, and parental awareness of the Early Intervention program.

Gaps in Access to Functional Resources as Downstream Factors

Functional resources that are tied to the location of residence, such as land-line telephone service, postal mail service, child care in the home or nearby, transportation or a cell phone provided by other residents of the housing location, or shared transportation via a bus service or neighborhood carpool, may be impacted by act of moving residencies either to a temporary or permanent location. To date, no prior studies have investigated the relationship between changes in housing with changes in access to functional resources as a downstream factor that may impact access to pediatric health care services.

For example, it is possible that families experiencing periods of temporary housing or frequent moves characterized by a net positive or negative change in their overall housing situation may still experience gaps in access to functional resources. However, among families experiencing net positive changes, the gaps might be short lived or quickly replaced by new resources. For these families, the impact of gaps in functional resources on medical visit attendance might be mediated by the overall impact that the net positive change in housing status has on the child's access to stable resources.

One of the pathways of impact involves the hypothesized change access to these resources caused by experiences of housing insecurity, as identified by changes in the physical location of a child's residence. This study adds to the literature on how housing insecurity impacts access to health care services by exploring whether there is a relationship between

missed or rescheduled health care visits, gaps in access to functional resources used to attend any outpatient medical visits, and experiences of housing insecurity.

In order to more fully grasp potential points along the river metaphor pathway that may be contributing to magnifying disparities in rates of utilization of the Early Intervention program among low-income and African American children, this study specifically examines the impact of well-child visit attendance on parental awareness of the Early Intervention program. Additionally, knowing that parental concern may also play a role in a parent's health information seeking behaviors during medical visits, I hypothesize that parental concern is also a mediator of the relationship between housing insecurity and parental awareness of the Early Intervention Program.

The next section applies the adapted SDH framework to explore the second pathway of influence between housing insecurity, health care utilization, and parental awareness of Early Intervention. In this pathway, the pediatric health care utilization and continuity of care serve as protective factors specifically among children who experience early adverse experiences or birth health conditions putting them at higher risk for future developmental delays. This argument sets the framework for understanding the method that I use in exploring the relationship between housing insecurity and health care utilization and for exploring continuity of care and parental concern separately as mediators between housing insecurity and parental awareness of the Early Intervention program. Additionally, a health equity lens will be applied to the social determinants of health model in order to posit the importance of looking at possible racial disparities in both pathways occurring within these pre-Early Intervention program engagement processes specifically among African American children.

Exploring Housing Insecurity and Racial Disparities Through Health Equity

Even before birth, children do not all start out on equal footing towards achieving a healthy life. Children born into families experiencing poverty are more likely than their more financially supported peers to experience low birth weight or prematurity, both of which are associated with having a higher risk for developmental delays (B. L. Williams, Pennock-Román, Suen, Magsumbol, & Ozdenerol, 2006). African American children, regardless of income status, are also more likely than children of other races to be born prematurely or with low-birth weight making it even more important for children to be screened and connected with Early Intervention support services (Insaf & Talbot, 2016; Lu & Halfon, 2003).

Pediatricians and child development researchers know that children born into in low-income households are at higher risk for both developmental delays, a known health outcome disparity (Pascoe et al., 2016). Researchers studying child poverty as a social determinant of health have routinely found that children living in low-income households are also likely to experience housing insecurity, another known social determinant of health (Cutts et al., 2011; Skobba, 2016; Weitzman et al., 2013).

As stated in Chapter Three, social determinants of health interact with a person's racial identity when those upstream and downstream social factors are disproportionately experienced by one race compared to another. In Rochester, NY as in other areas of the country, African American children are more likely to live in isolated areas of concentrated poverty and housing insecurity (Doherty, 2013). Children facing multiple social adversities in early childhood are at greater risk for experiencing the negative health outcome associations with those adversities (Braveman, 2014; Braveman et al., 2011).

Tandem with the knowledge that poverty along with other commonly studied adverse early experiences, such as parental domestic violence, parental substance abuse, and parental depression, in early childhood are associated with negative behavioral and health outcomes for children later in life (Hunt, Slack, & Berger, 2017), pediatricians and medical providers are acutely aware that developmental gains during the earliest years of life are crucial for laying the foundation for later growth (National Scientific Council on the Developing Child, 2014). For all of these reasons, the American Academy of Pediatrics has asserted that medical providers should play a central role in helping to improve health outcomes by directly addressing social determinants of health and of other adversities in pediatric settings (Bethell et al., 2011; Strickland, Jones, Ghandour, Kogan, & Newacheck, 2011).

However, to address the social determinants of health in pediatric settings, families experiencing hardships need to attend medical visits. Although this seems like a basic foundational assumption, there is little information available in administrative databases that documents whether the families with young children who attend well-child pediatric medical visits are experiencing forms of housing insecurity outlined in the second chapter on the conceptualization of housing insecurity.

However, for the families who are attending outpatient medical visits, practices that establish a continuity of care with their pediatric patients have higher rates of on-schedule immunizations and reduced emergency department visit rates (Strickland et al., 2011). Therefore, those who do attend pediatric appointments, children who experience continuity of care may have a better likelihood of completing preventative care services on-schedule and may also be less in need of attending emergency department visits. While information on pediatric continuity of care among children ages one through three has been shown to be effective in

reducing emergency room visits (Enlow, Passarella, & Lorch, 2017), there is little information specifically on whether or not continuity of care impacts parental receipt of information about developmentally supportive services at developmental screenings that take place within the context of outpatient visits during the first three years of life.

In the adapted social determinants of health model for this study shown in Figure 3, continuity of care is a feature of health care utilization examined not only as an end unto itself, but also as a feature of another SDH pathway. First, continuity of care serves as a possible mediator curbing the potentially negative impacts of housing insecurity on child health and developmental outcomes. Secondly, it serves to highlight the influence that pediatric well-child visits theoretically have in linking families experiencing housing insecurity with developmentally supportive services for their children, such as the Early Intervention program.

However, attendance at a visit is not the only factor that influences whether a parent ultimately receives information about the Early Intervention program. As shown in Figure 3, there are other upstream and downstream factors unrelated to processes occurring in health care settings that may influence parental awareness of the EI program. For example, the level of restrictiveness of eligibility rules for EI enrollment set at the state level is inversely associated with enrollment patterns (McManus et al., 2014). Parental feelings of stigma (Lea, 2006), parental level of familiarity with developmental milestones and disabilities (Zuckerman et al., 2018), program characteristics and specific program enrollment processes (McCurdy & Daro, 2001) also influence parental behavior and decision making as it relates to their children's enrollment in voluntary support programs.

Additionally, there are further components of the medical encounter with providers that influence parental understanding, awareness, and communication processes about their own

concerns and of developmental screening results. Figure 4 summarizes the basic pathways within the medical encounter at pediatric outpatient visit settings hypothesized to impact parental awareness of the Early Intervention program. The solid arrows indicate the relationship between housing insecurity and specific downstream pathways explored in this study: 1.) Does housing insecurity impact well-child visit attendance? 2.) Does continuity of care mediate the relationship between housing insecurity and parental awareness of the Early Intervention program? 3.) Does parent concern about their child's development mediate the relationship between housing insecurity and parental awareness of the early intervention program?

Additionally, the dotted lines in Figure 4 represent non-measured processes that could also influence parental awareness of EI. Namely, the conversation dynamics between parents and providers may be influenced by any degree of confluence or discordance in providers' and

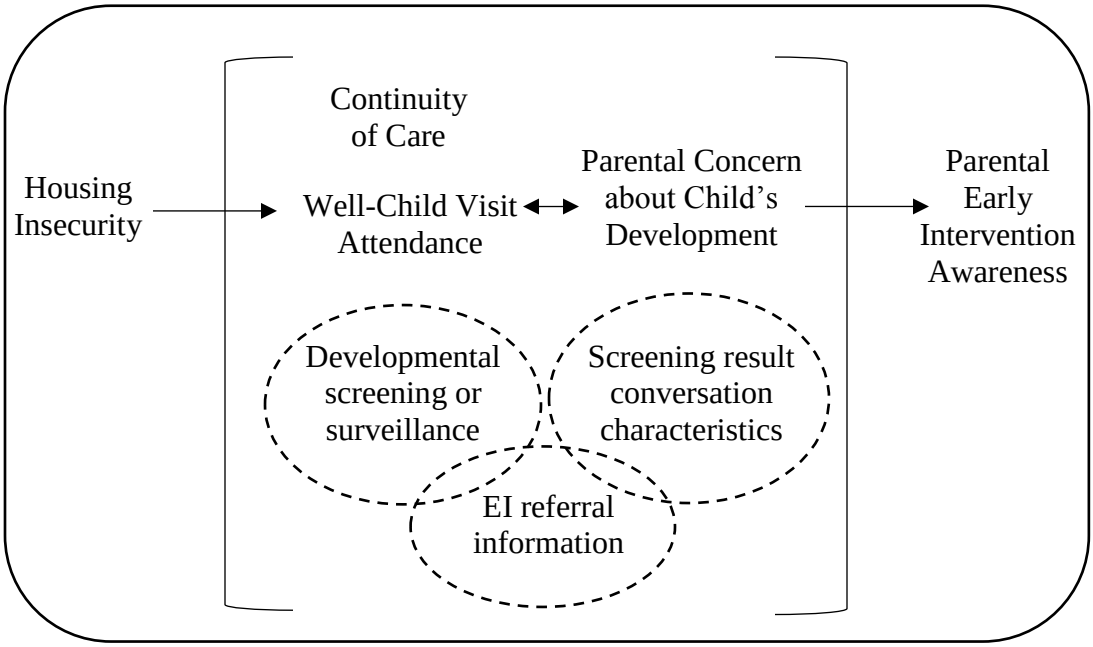

Figure 4. Complex pathways within the parent-provider pediatric encounter

parents' cultural beliefs about children's abilities or developmental trajectories (Shim, 2010). Additionally, parents may feel overwhelmed by the complicated terms and high-register medical information that commonly accompanies developmental screening result conversations (Guevara

et al., 2016). These factors may impact parents' memories of conversations and ability to recall information about their past conversations with providers about the Early Intervention program.

Although these important factors are not measured in this study due to feasibility and methodology limitations, it is important to acknowledge a priori that these factors likely affect what, how, and when communication occurs during encounters between pediatric patients' parents and their medical providers[2]. This project focuses on exploring two interrelated pediatric visit processes hypothesized to be impacted by upstream factors of housing insecurity and downstream factors of disruption in routines and access to functional resources. These interrelated pediatric processes are, 1.) attendance at visits and establishing continuity of care, as well as 2.) the relationship between continuity of care, parental concern about their child's development, and parental awareness of the Early Intervention program.

However, as shown in Figure 4, there is an additional bidirectional factor to acknowledge. Parental concern about their child's development is hypothesized to impact attendance at well-child pediatric visits as well as the likelihood that parents might receive information about the Early Intervention program at the visit. Inclusion of this variable in a bidirectional relationship with well-child visit attendance acknowledges that there is yet another system, namely the parental decision-making process, which contributes to the dynamics in question in this study. A systematic review of interventions to increase parental engagement in a related service, children's mental health programs, revealed that parental beliefs about children's development and health strongly influences parental decision-making about participation in children's support programs (Ingoldsby, 2010).

[2] For a related example of how interpersonal dynamics in health care service settings serve as mechanisms that can reproduce and enhance racial disparities in health care treatment, see van Ryn and Fu (2003) and Shim (2010).

Therefore, to roughly characterize parental level of concern about children's development as a proxy for acknowledging variance in the sample related to parental decision-making processes, this study surveys parents for general concerns about their child's development at any point during the first three years of life. It also asks about various health related statuses both at the child's birth and currently at the time of the study. These sample characteristics of parents and children will be reported in Chapter Six in the description of the study sample. Children's health at birth will also be used as control factors in each of the separate explorations of housing insecurity's impact on well-child visit attendance, continuity of care, and parental awareness of the Early Intervention program.

In this project, I also test for the presence of commonly found patterns of racial disparities in birth outcomes, namely, low-birth weight and prematurity, experienced by African American children compared to children of other racial identities. These disparities have been found among African American children living in racially and socioeconomically segregated neighborhoods (Mehra, Boyd, & Ickovics, 2017). Furthermore, I test for the presence of racial disparities in access to preventative and promotive health care beginning as early as after birth and through the early years of life.

Testing for racial disparities in access to care beginning as early in life as at birth follows from Lu and Halfon's (2003) conclusion that social determinants of health impact African American mothers' reproductive health and African American children's birth health outcomes through disparities in trajectories in access to preventative and promotive health care over the life course. Although I am not hypothesizing that there is a relationship between health care access from birth to three years old and children's later reproductive health, examining the earliest point in a person's post-birth life course where disparities in access to care during crucial

developmental growth periods may begin illustrates the point that health trajectories may diverge along racially disparate lines very early in life.

This study explores a specific set of processes and relationships between upstream factors and downstream factors for possible evidence of racial disparities in access to preventative care and receipt of information about the universally available Early Intervention program. As I discussed in Chapter Three, housing insecurity and related neighborhood-based social disadvantage are experiences that are largely concentrated along racial lines and are directly associated with racial disparities in health outcomes (Mendenhall, 2018; D. R. Williams & Collins, 2001). Therefore, this study acknowledges that housing insecurity and racial disparities must be explored and discussed in tandem for their associations with patterns in pediatric health care utilization and parental awareness of the Early Intervention program.

The adapted upstream and downstream metaphor in the SDH framework shown in Figure 3 and Figure 4 are useful in highlighting some of the complex, interdependent pathways through which racial disparities in access to preventative health care and the receipt of information about EI may continue to perpetuate decade after decade, generation after generation. This exploratory study provides information on health care utilization patterns among children who experience housing insecurity in a variety of forms and explores upstream and downstream connections between housing insecurity, health care utilization, and parental awareness of the Early Intervention program during the first three years of children's lives.

The next chapter presents the methodology utilized in exploring the primary research questions addressed in this project. The chapter begins by presenting the processes leading to the formation of the data collection interview survey. Then, I describe the recruitment and sampling strategies along with statistics representing a successful recruitment rate despite the low final

sample size. In the final sections of the next chapter, I present the research hypotheses, variables, and analytic strategies.

Chapter Five – Study Methodology

In this chapter, I present the methodology that I utilized in exploring the relationship between housing insecurity, utilization of health care services, and parental awareness of the Early Intervention program in a sample of caregivers with three-year-old children living in Rochester, NY and the surrounding suburbs in Monroe County. As described in prior chapters, my project examines three interrelated sets of questions using a social determinants of health and health equity framework. The research questions and related hypotheses presented in this chapter address the intersections of the following three topics: 1.) housing insecurity and health care utilization; 2.) housing insecurity, health care utilization, and parental awareness of the Early Intervention program; and 3.) racial disparities in birth health, health care utilization, and parental awareness of the Early Intervention program. The following sections describe the study design, recruitment strategy, data collection procedures, hypotheses, and data analysis plan undertaken in this project.

Methods

Design. I utilized an exploratory approach to investigating the primary research questions presented in Chapter One. Due to the depth of investigation into experiences of housing insecurity and the specific nature of questions about children's development and of processes occurring at well-child visits, I discovered that validated instruments gathering the specific array of information needed for this study could not be found. Therefore, I utilized the literature review and conceptual framework presented in the prior chapters to create a semi-structured interview designed to collect data to test the set of hypotheses using exploratory data analysis techniques. The semi-structured interview script was reviewed informally by experts in early childhood development and by parents and providers with Early Intervention program

experience. The interview data collection instrument also underwent a pilot test with a focus group of low-income parents of young children. The focus group pilot test process and results are described below.

Pilot Test Focus Group. A pilot test of the data collection instrument was conducted in order to test the question stems and answers for clarity and accuracy in understanding the intended meaning. A local agency in Rochester, NY that serves low-income families and children through parent education programs and through programs for families and children with special needs agreed to allow me to recruit parents to participate in a one time, pilot test of the survey instrument during a focus group. We agreed that no program from within the agency was to be used as a recruitment site for the official data.

I connected with the facilitator of a weekly parent education program within this agency. The facilitator received verbal permission from all of the parents in the educational group willing to participate in a focus group designed to provide me with feedback on the survey. During a two-hour meeting, I read aloud sections of the data collection instrument to a group of eight parents of children ranging from two-years-old to twelve years old. The questions were read aloud to simulate the experience of listening to the survey questions being administered by telephone. All children of the parents in the focus group qualified for the receipt of Medicaid and thus were from a similar low-income economic status as the intended study population.

Focus group feedback. The pilot group participants unanimously agreed that question responses that required short-answers should be avoided. They suggested instead to give answer choices including the choice of "other", where applicable. Specifically, the respondents suggested removing open-ended questions about the number of well-child and sick-child visits that were attended during each of the first three years of their children's lives. Focus group

participants stated that they could not reliably remember the specific number and type of visits attended each of the first three years of life. Instead, they suggested asking in general if they ever recalled taking their children to specific appointments where certain features of the appointments, like immunizations, would have occurred.

They also suggested presenting participants with the number of routinely scheduled visits for each year of life and asking follow-up questions about caregivers' memories of missed visits rather than completed visits. The rationale for that change was that they felt parents would be more likely to pause before responding to carefully reflect on their memories of missing a scheduled visit. The final version of the study survey was edited to reflect the focus group respondents' suggestions and feedback.

Additionally, most respondents suggested rewriting all questions in the survey so that answers could be simply "yes" or "no" throughout the survey. This also required eliminating certain questions where "yes" or "no" responses were not appropriate. These suggestions were prompted by the section of the survey on housing status history. Originally, the questions and responses were open-ended, short-answer style with a list of prompts the interviewer planned to use to jog the respondents' memories of housing experiences. However, respondents described that the original housing status history questions were too wordy and confusing to listen to, understand, and respond to over the telephone. The section on housing history in the final version of the survey instrument was changed to be in alignment with the focus group respondents' feedback.

The respondents also gave feedback on specific terms used in the survey. The respondents generally agreed that the term "outpatient clinic" was not regularly used when describing pediatric appointments taking place with a child's routine doctor. The focus group

respondents suggested that the term "outpatient clinic" be replaced with "primary care doctor" or "primary care medical office" throughout the survey. Additionally, the group felt that terms like "well-child" and "routine care" were familiar and used regularly in conversation about their children's health care visits. The final data collection instrument was updated to reflect the group's feedback on common language usage and familiarity with these terms.

Institutional Review Board. All study documents including the recruitment materials, screening and informed consent scripts, and data collection instrument were reviewed and approved by the Institutional Review Board (IRB) at Bryn Mawr College (BMC) prior to the initiation of study activities. (See Appendices A through C to review a copy of the study documents and recruitment flyer.) The study received initial approval from Bryn Mawr College's Institutional Review Board on March 23rd, 2017. Additional amendments to the study were made after I conducted a pilot test of the data collection instrument with a focus group of volunteers. The finalized study documents were also translated into Spanish by a native Spanish speaker. All amendments and translated documents were reviewed and approved by the IRB at BMC prior to the initiation of any data collection procedures. The study underwent a continuing review process after remaining active for one year. I received continuation approval on March 7th, 2018.

In order to recruit from certain daycare centers, I also was required to secure IRB approval from public school system(s) where classroom students reside. In order to protect the privacy of the school district(s) involved, the school system(s) will remain nameless in this project. However, as required, public school legal and IRB approval(s) was obtained prior to beginning any recruitment procedures at the sub-contracted daycare centers.

Sampling and Recruitment Strategy. All recruitment sites and participants were chosen using non-probability convenience sampling methods. To target families likely to also have experienced some housing changes during the first three years of children's lives, agencies whose majority of participating families qualify for free or low-cost Medicaid health-insurance due to low-income status were invited to participate as recruitment sites for the study. This recruitment site sampling method was chosen due to knowledge that economic insecurity and housing insecurity are often experienced in tandem (Clark, 2010; Kingsley et al., 2009). This recruitment site sampling method supports the goal of capturing as wide of a variety of housing status experiences as possible in the recruitment sample, including children who may have some form of housing insecurity not related to residential mobility.

Eligibility. Parents or guardians of three-year-old children were eligible to participate in the study. Parents or guardians were required to be fluent in English or Spanish. No questions about housing status or income status were included as eligibility criteria.

Recruitment sites and target sample population. The recruitment sites consisted of a mixture of daycare and early childhood educational centers, hospital pediatric outpatient waiting rooms, and online local parent groups on social media platforms serving parents of young children. All physical recruitment sites were located within the city limits of Rochester, NY. All local parent groups on social media sites served parents living within Monroe County, NY.

The recruitment period lasted about 15 months from April of 2017 through mid-July of 2018. During that time the target study ample size began at 250 participants, reduced mid-way to 100 participants, and ended with 40 research subjects. The reduction in the target sample size was caused by delays in the acquisition of recruitment site participation permission and scheduling delays due to the onset of summer schedules when participating daycare and

educational center recruitment sites were routinely closed to families. I estimated approximately a 30% participation rate and therefore projected a need to engage with approximately 134 caregivers of three-year-old children in order to acquire a final sample size of 40 participants.

Online local social media groups. Local social media group administrators of private groups of parents of children of all ages living in Monroe County, NY were approached individually via Facebook messages to ask for permission to post information about the research opportunity for parents of three-year-old children to see. Each group had approximately 1,300 members at the time of study recruitment. It is not known how many of the members had three-year-old children or how many of the members lived in low-income households. I posted one time in each group and received private email messages directly from caregivers interested in hearing more about the opportunity to participate.

Daycare centers. I received permission to attend multiple meetings of early childhood daycare and educational center directors where information about the study was presented. Approximately 15 – 20 center directors or administrators were present at these meetings. Many of these centers were also designated sites serving students eligible for the full-day or half-day Universal Pre-K program through the public school system. Center directors agreed to a range of levels of participation as recruitment sites after I received permission from the school district to allow the students at these sites to be recruited for the study.

Four child care and educational centers serving a cumulative total of approximately 375 children per year agreed to take copies of the recruitment flyer to distribute directly to parents and caregivers of the three-year-old children in their classrooms and programs. Of these three centers, one served primarily 40 Spanish-speaking families with three-year-old children and one served approximately 25 three-year-old children with a wide range of special health care needs

or developmental disabilities. The two other centers that agreed to distribute flyers served approximately 310 children.

One additional center serving approximately 90 three-year-old children permitted me to stand outside of age-specific classrooms on multiple days when caregivers pick up their children at the end of the day to hand out recruitment flyers in-person and collect caregiver's names and phone numbers directly. Caregivers interested in the study who provided contact information received a call on a different day to continue to discuss the possibility of participating.

Hospital outpatient pediatric department waiting rooms. At the time of the study, there were three major hospitals within the metropolitan area of Rochester, NY. Two of the three permitted the recruitment of parents or guardians of three-year-old children from their pediatric outpatient department waiting rooms. Both of the pediatric outpatient departments functioned as medical homes for their patients. Neither of the two hospitals required that the project be reviewed by their internal institutional review boards because no hospital staff or sites were being used to conduct participant eligibility screening or data collection activities. Both hospital pediatric departments serving as study recruitment sites reported conducting formalized developmental screening assessments at 9-months, 12-months, 18-months, and 24-months or 30-months of age, as per the AAP recommended periodicity noted in Chapter One. Neither pediatric department routinely tracked the number of referrals specifically to the Early Intervention program given during well-child developmental screening sessions.

On average, the hospital waiting rooms conducted approximately 25 to 40 three-year-old well-child visits per month and had an average of 75-120 scheduled visits per day for children of all ages. The hospital administrators reported that there was approximately a 30% no-show or cancelation rate for all pediatric visits.

One administrator at a hospital pediatric outpatient site worked with me to identify 3 to 4-hour segments of the day when a higher frequency of three-year-old children would be present and allowed me to sit in the waiting room during those days and times. No patient-specific identifiable information was given to me. The other hospital outpatient site did not provide any form of targeted recruitment support. Both hospital pediatric outpatient sites allowed me to conduct recruitment in-person in the waiting area. At a later time, I called caregivers recruited from waiting rooms to continue to discuss the possibility of participating.

Recruitment statistics. A total of sixty-nine caregivers of three-year-old children gave contact information me or independently reached out via email to me to express interest in receiving a call to discuss the possibility of participating in the study. A total of forty caregivers of three-year-old children, or 58% out of the sixty-nine people who initially engaged with me in-person or electronically, participated in the study. Of the sixty-nine contacts, forty-five (65%) were collected in-person at pediatric waiting room or child care center recruitment sites and twenty-four (35%) were collected electronically via email. Fifty-eight (84%) of the sixty-nine total caregivers who initially expressed interest in being contacted were subsequently reached by phone, email reply, or text message. Of these fifty-eight caregivers, forty people (69%) participated and completed all study procedures. Sixteen caregivers (28%) were never reached for a live call despite my repeated attempts. Two caregivers (3%) who were reached decided not to participate for independent reasons including the lack of guaranteed compensation and a desire to maintain privacy.

Data collection and storage process. I collected all of the study data through telephone interviews that took place in a private office. All forty of the data collection interviews initiated by phone were completed in one telephone call session. The average duration of the calls was 30

minutes and included the eligibility screening, informed consent process, and data collection interview procedures. All interview questions were voluntarily answered and there was no missing data in any of the collected responses. A copy of the eligibility screening questionnaire is located in Appendix A. A copy of the informed consent script and the data collection script are located in Appendix B.

Data collected during the interview was directly entered into an online data collection system hosted on a password protected and encrypted server called Qualtrics. Data collected was kept confidential and participants were informed that there was no way that individual caregivers or their children could be identified based on their responses. The final, deidentified dataset was downloaded to a local computer for analysis using a remotely hosted free version of SAS University, a statistical software package.

Hypotheses

Housing insecurity and health care utilization. The first set of hypotheses explores the relationship between several different conceptualizations of housing insecurity and pediatric health care utilization. The components of health care utilization examined are number of well-child visits missed, missed or rescheduled outpatient pediatric visits due to lack of transportation or child care access, achievement of continuity of care, and use of emergency room or urgent care centers for pediatric visits. The following are specific research questions and related hypotheses predicting the association between experiences of housing insecurity and health care utilization patterns among children during the first three years of life:

Question 1: Does housing insecurity impact the number of well-child visits missed?

Hypothesis 1: There is a positive relationship between the number of locations where children were reported to have lived and the number of well-child visits missed during

the first three years of a child's life. As the number of housing locations lived in increases, the number of well-child visits missed is expected to increase. The presence of lack of housing affordability, two or more moves in 12-months, or homelessness are each expected to have a positive association with the number of well-child visits missed.

Question 2: Does housing insecurity impact the likelihood of attending sick visits at a location other than an outpatient doctor's office?

Hypothesis 2: There is a positive relationship between each of the indicators of housing insecurity during the first three years of life and the likelihood that a child has attended sick visits at a location other than the pediatric outpatient office during the first three years of life.

Question 3: Does continuity of care moderate the relationship between housing insecurity and the frequency of missed well-child visits?

Hypothesis 3: Continuity of care mediates the impact of housing insecurity on the frequency missed well-child visits. Insecurely housed children who experience continuity of care are less likely to miss well-child visits compared to insecurely housed children who do not experience continuity of care.

Question 4: Does the presence of housing insecurity increase the likelihood that children ever missed and rescheduled an outpatient medical visit due to a lack of access to transportation or childcare?

Hypothesis 4: There is a positive relationship between the indicators of housing insecurity and the likelihood of missed outpatient medical visits due to gaps in access to transportation or childcare.

Housing insecurity and parental awareness of Early Intervention. The second set of research questions and related hypotheses center around the relationship between experiences of housing insecurity, child health status at birth, parental concern about their child's development, and parental awareness of the Early Intervention program. The following is a list of primary and secondary research questions and related hypotheses exploring of the association between these constructs:

Question 5: Is there a relationship between the presence of housing insecurity and parental awareness of the Early Intervention program controlling for child's health status at birth?

Hypothesis 5: There is a negative association between experiences of housing insecurity during the first three years of life and parental awareness of the Early Intervention program controlling for children's health status at birth.

Question 6: Does parental concern mediate the relationship between housing insecurity and parental awareness of the Early Intervention program?

Hypothesis 6: Parental concern about children's development mediates the relationship between housing insecurity and parental awareness of the Early Intervention program such that the presence of parental concern increases the likelihood of parental awareness of the Early Intervention program when controlling for housing insecurity.

Question 7: Does continuity of care mediate the relationship between housing insecurity and parental awareness of Early Intervention?

Hypothesis 7: Continuity of care mediates the relationship between housing insecurity and parental awareness of Early Intervention such that the presence of continuity of care increases the likelihood of parental awareness of Early Intervention when controlling for housing insecurity.

Racial disparities in birth health and parental awareness of the Early Intervention Program. The following are a list of research questions and related hypotheses focusing on the exploration of racial disparities in health care utilization, parental awareness of EI, and children's birth health status:

Question 8: Are there racial disparities in parental awareness of the Early Intervention program when controlling for parental concern about children's development or children's health at birth?

Hypothesis 8: African American children are more likely to have parents who lack awareness of the EI program compared to children of all other races when controlling for parental concern about children's development or children's health at birth. White children are more likely to have parents who are aware of the Early Intervention program compared to children of all other racial identities, controlling for parental concern about children's development or children's health at birth.

Question 9: Are there racial disparities in birth health status among children in the sample?

Hypothesis 9: African American children are more likely to experience low-birth weight, premature birth, or a health condition or diagnosis at birth that doctors are concerned could negatively impact their future development compared to children of other races.

Question 10: Are there racial disparities in the likelihood of missed well-child visits or the likelihood of urgent care or emergency room visit attendance controlling for parental concern about children's development or children's health at birth?

Hypothesis 10: African American children are more likely to miss well-child visits and are more likely to attend urgent care or emergency room visits than are children of all other racial identities when controlling for parental concern or children's health at birth.

Independent Variable

Housing insecurity. The primary independent variable, housing insecurity, was operationalized five different ways in order to reflect the diversity of conceptualizations of housing insecurity in the literature. Some of the operationalizations reflect patterns of measurement frequently encountered in related literature. Other operationalizations are specific to this study and its exploratory aims. Each iteration of the housing insecurity variable has been run in separate analyses in order to determine which conceptualizations have a significant association with the dependent variable being tested.

First, housing insecurity was represented as a continuous variable indicating the number of places that children lived during the first three years of their lives. This variable represents

housing insecurity over the first three years of a child's life as a measure of the frequency of moves occurring during this period. There are a limited number of studies of the frequency of moves occurring during this specific three-year period of years in early childhood. Therefore, a variable that represents the entire range of the number of moves occurring during this period is designed to explore whether each additional move has an impact on the likelihood of attending all well-child visits, the likelihood of experiencing continuity of care, the likelihood of attending visits at an urgent care or emergency department, or the likelihood of parental awareness of the Early Intervention program.

However, there are studies that utilized number of moves over varying periods of time to indicate the presence or absence of housing insecurity in families or children's lives (Cox et al., 2017; Cutts et al., 2011; Murphey et al., 2012). The second operationalization of housing insecurity in this study was represented by a dichotomous variable indicating whether or not two or more moves occurred within any 12-month period. This threshold was chosen to align with the findings of Cutts and colleagues (2011) that two or more moves during a one-year period was associated with poor health outcomes in early childhood.

Third, lack of affordability of residential rent or mortgage payments and doubling up living with others are indicators of housing insecurity. Respondents were asked whether they worried about being able to afford their living situation or ever doubled up with another family or friends at any point during the first three years of their child's life. The dummy variable was coded "yes" if either or both of these housing insecurity indicators were present. The rationale for merging these two indicators into one variable is that both doubling up with another family and worrying about being able to afford rent are commonly reported experiences by families

struggling with housing affordability (Clark, 2010). Since these two experiences are so closely related to affordability, the two independent survey questions were coded into one variable.

Fourth, housing insecurity was operationalized as a dummy variable that represents any experience of homelessness as defined by living in a shelter or not having beds to sleep in at night. This question was only asked of people who reported that the child lived in more than one location. For those whose children only lived in one location, the housing insecurity variable representing having experienced homelessness was coded "no". For all other cases of children who did live in more than one location, the dummy variable was also coded "no" if the child never experienced living in a shelter or an absence of a bed. The dummy variable was coded "yes" if either of those two conditions were met at any point during the first three years of the child's life.

Lastly, a set of principle component variables exploring the relationship among collections of reasons for moving reported by the respondents was created using data on reasons for moving during the entire three-year period. There is a dearth of quantitative research that explores patterns of housing insecurity indicated by the combination of different characteristics of reasons for moving over a specific period of years in a person's life. I create a set of principle component variables specifically representing housing mobility insecurity that is characterized by reasons for moving reported by the study sample.

To create a set of principle component variables representing housing mobility insecurity, I used the classifications of reasons for moving along push and pull factors in order to look at the group of reasons for moving together and as push and pull categories separately. Refer to Table 1 in Chapter Two on the conceptualization of housing insecurity to review the specific reasons for moving and their push or pull classifications. Principle component variables were created

using the subset of cases that reported at least one experience of moving. The housing mobility insecurity principle component variables were subsequently correlated with each reason for moving separately to explore their meanings.

Dependent Variables

Well-child visits. Well-child visits are routinely conducted according to the AAP periodicity recommendations. Although developmental screenings begin at 9 months old, there are other visits that are recommended prior to children reaching 9-months of age (American Academy of Pediatrics, 2006). During the data collection interview, participants were reminded of the recommended schedule for each of the first three years of life. Participants were then asked for each year separately if they recall that their three-year-old children missed any of the recommended visits. If a participant recalled that no visits were missed during the three-year period, the maximum number of visits that a child attended could be eleven visits. Number of well-child visits missed is the datapoint used for analysis in this study.

Functional resource gaps and missed or rescheduled outpatient visits. At the end of the survey, after asking respondents both about the medical visit history and housing history of their children, all respondents were asked about memories of having to miss or reschedule an outpatient pediatric visit at any point in the first three years of their children's lives due to specific experiences of lacking either transportation or child care for siblings of the three-year-old child. Respondents were specifically asked if they ever had to miss or reschedule outpatient pediatric outpatient visits due to not having access any to child care or transportation. Gaps in child care or transportation causing missed or rescheduled visits are another pattern of health care utilization utilized as a dependent variable in this project. Responses to questions about lack

of access to child care or transportation causing a missed or rescheduled outpatient pediatric visit were recoded into a single dummy variable.

A follow-up question was also asked of participants who had previously replied that they moved at least one time during the first three years of their child's life. Separately asked for each resource, child care and transportation, respondents were asked if the gap in access to child care or to transportation was caused by or related to housing status changes occurring around the time of the missed visit. These two questions were recoded into a single dummy variable representing whether the gap in either child care or transportation were caused by or related to experiences of housing status changes occurring near to the time of the missed or rescheduled visit. This variable was collected to provide an exploratory report of participants' subjective responses regarding the relatedness of the gap in resources and experiences of residential mobility.

Urgent care and emergency department use. Urgent care and emergency department use are represented as separate dichotomous variables indicating that children had or had not visited these locations during the first three years of life.

Continuity of care. Continuity of care is represented two ways. First, it is operationalized as a dichotomous variable indicating the presence or absence of continuity of care for outpatient pediatric visits. Respondents were asked if their child attended the same pediatrician or primary care doctor's office during the entire three years of life. If they responded "yes", then the continuity of care variable was coded as "yes". Subjects who responded "no" were asked how many different pediatrician or primary care doctor's office the child was seen at during the first three years of life.

The frequency of outpatient pediatric offices seen at during this period is the second operationalization of continuity of care in this study. Arguably, continuity of care may still be established at more than one doctor's office during the first three years of life. Families may choose to change primary care doctor's offices voluntarily due to a dissatisfaction with the care provided, due to moving and wanting an office closer to their new residence, or for a host of other reasons. Since this is an exploratory study, both the dichotomous variable representing the most conservative definition of continuity of care and the continuous variable representing the actual number of offices attended by children during the first three years of life are utilized as dependent variables in this study.

Parental awareness of the Early Intervention Program. Parental awareness of the Early Intervention program is represented by a dichotomous variable indicating its presence or absence. Respondents were asked whether or not they were familiar with the Early Intervention program. Those who responded that they were not sure were then offered more information about the program in order to jog subjects' memories of familiarity of the program and were given an opportunity to answer after receiving this additional information.

Other Variables

The following are a description of variables collected in the study survey that are utilized in various ways in the exploratory analysis. Due to the small size of the sample collected in the study, only a few of these variables are explored for their relationship as possible mediators or moderators of relationships between housing insecurity and various dependent variables.

Demographic variables. Respondents were asked questions about themselves that included describing their educational attainment, occupational status, and relationship to the three-year-old child. They were also asked to report on the number of siblings that the child had

at the time of the study and they were asked to provide the child's racial identity. Respondents were also asked to report on the child's health status at birth (See Q3.1, Q3.2, and Q3.3 in Appendix B for specifics on birth health characteristics.) They were also asked questions about the economic status of the household at the time of the study including total annual household income and status of receipt of a list of public welfare programs and services during the same most recent year.

Parental and medical provider concerns about child's development. Respondents were asked if they ever had concerns about their child's development and they were asked to name specific concerns that they had. The dummy variable representing parental concerns about children's development is hypothesized to be a mediator in the relationship between housing insecurity and parental awareness of the Early Intervention program. Respondents were also asked if they recall if their child's medical doctors or nurses ever told them that their child might benefit from extra services or help with the child's development in any specific area. If the respondent answered "yes", the respondents were also asked to name specific domains of development that the doctors or nurses may have mentioned.

Parental memory of receiving information about the Early Intervention program from the child's primary care medical providers. All respondents who replied that they were familiar with the Early Intervention program were asked a follow-up question. They were asked whether or not they recall receiving information about the Early Intervention program from their child's primary care doctors or nurses. Due to the small sample size achieved in the study and to acknowledge the myriad of ways that families may receive similar information about the Early Intervention program, this information was used to describe the sample, only.

Gaps in access to telephone service or reliable mail service. All respondents were asked if they had ever changed their telephone number or lost access to a primary telephone number at any point during the first three years of their child's life. Respondents were also asked if they ever had trouble receiving mail by postal service at any point in the first three years of their child's life. Participants who also reported having moved residences at least once during the same period were also asked if they believed that the change in telephone number or access to reliable mail service was related at all to housing status changes.

Analytic Strategies

Power and sample size limitations. As mentioned throughout the chapter, the explanatory power of the analyses conducted are limited by the small sample size acquired. I utilized G*Power, a software program, to calculate the statistical power that will be achievable using one single or two predictors in the regression models. Given a desired detectible effect size of .15, a sample size of 40, and using 1 predictor, the resulting Critical F is 2.07 and statistical power is 0.84. With a sample of 40, an effect size of .15, and two predictors, the resulting Critical F is 1.69 and the statistical power is .80. Therefore, in both situations statistical power to detect an effect size of .15 or greater is limited by the small number of respondents collected in the study sample. Similar limitations are present for all statistical tests conducted using this dataset.

Regression analyses. To assess the question of whether or not housing insecurity impacts the likelihood of attendance at well-child visits, I conducted a series of linear regression analysis. In order to assess the question of whether or not continuity of care is a moderator of the likelihood of attendance at well-child visits, I had intended to conduct a Baron and Kenny regression analysis to assess if the presence of continuity of care moderates the relationship

between housing insecurity and well-child visit attendance. However, due to the small size of the sample and the lack of variance found in the well-child visit attendance and continuity of care variables, well-child visit attendance was not able to be used as a dependent variable and continuity of care was not able to be tested for moderation. The results of the descriptive analyses done to assess the patterns in variance in the independent and dependent variables collected in the study is presented in the next chapter.

Logistic regressions were computed to determine whether there is a relationship between housing insecurity and the likelihood of having missed a medical visit due to a gap in child care or transportation. Logistic regressions were also computed to determine the relationship between housing insecurity and the likelihood of attending visits at an urgent care office or at an emergency department at any point during the first three years of the child's life. Logistic regressions were also used to test for relationships between housing insecurity and parental awareness of the Early Intervention program.

Each of these three different dependent variables were utilized in a series of three regression analyses. First, each of the four indicators of housing insecurity were run in separate bivariate regressions to test their relationships with each dependent variable. Second, each of the four indicators of housing insecurity were run in separate logistic regression analyses controlling for parental concern about their child's development. Third, each indicator of housing insecurity was run in a logistic regression analysis controlling for children's health at birth.

Testing for racial disparities. Chi square tests for independence analyses were used to explore the sample for racial disparities in birth health status, health care utilization patterns, and parental awareness of the Early Intervention program. When results were statistically significant, logistic regression analyses were conducted to determine the level of statistical

significance and the magnitude of the differences between children of different racial identities in the likelihood of experiencing specific birth health characteristics, the likelihood of having specific patterns of health care utilization, and the likelihood of having parents who were aware of the EI program.

Descriptive Statistics. Descriptive statistics that characterize patterns of housing insecurity, the presence or absence of continuity of care, and patterns of gaps in access to functional resources that occurred during the first three years of children's lives were explored. Additionally, reports on medical provider concern and parental recall of having received information about the Early Intervention program from medical providers are summarized as part of descriptive statistics for the sample.

Study Summary

Chapter Five presented the study design and methods that I used in exploring the relationship between housing insecurity, health care utilization, and parental awareness of the Early Intervention program. Acknowledging the limitations posed by the lower than desired sample size, the following chapter presents the results of the analyses that I performed. In the final chapter of the dissertation, I present the limitations posed by the small sample size and by sampling bias. I also interpret and present the implications of the findings for social work practitioners, policy makers, and researchers working with families with young children who may be experiencing multiple social adversities during the earliest years of life.

Chapter Six – Study Results

In this chapter, I present the sample demographics, descriptive statistics, and results of the statistical analyses. The results from the analyses are organized into four primary topics: 1.) Housing insecurity and parental awareness of the Early Intervention program (EI), 2.) Racial disparities in parental awareness of EI, 3.) Racial disparities in birth health status, and 4.) Housing insecurity and health care utilization.

Sample Demographics

Respondent characteristics. A total of forty caregivers of three-year-old children, representing 58% out of the 69 people who initially inquired about the study, participated in the study. Of the forty participants, 12 (30.0%) were recruited from hospital settings, 16 (40.0%) were recruited from daycare centers, and 12 (30.0%) were recruited from online social media groups. Thirty-seven (92.5%) of the forty total participants were female and the remaining three (7.5%) participants were male. All respondents reported that they were the legal guardian of the three-year-old child. Thirty-five respondents (87.5%) identified themselves as the child's biological mother and three (7.5%) identified themselves as the child's biological father. Two (5%) of the respondents identified themselves as an extended relative of the three-year-old child who also has guardianship over the child.

The participants' ages ranged from 20 to 75. The mean age was 33 years old and the median age was 31.5 years old. The respondents' highest level of education completed ranged from some high school to having completed a graduate or terminal degree. Five respondents (12.5%) reported having some high-school education, seven respondents (17.5%) reported having graduated high school or having completed a GED, 13 respondents (32.5%) reported having attended some college or professional training, five respondents (12.5%) reported having

a 2-year or 4-year college degree, and 10 respondents (25%) reported having completed a graduate or professional degree beyond college. Seventeen (43%) of the respondents were unemployed while 23 (27%) were employed either full or part-time. Nine (23%) of the respondents also identified themselves as students.

Household Characteristics. Reported household income ranged from $5,000 to $120,000 with the mean income being $43,000 and median being $26,500. Twenty (50%) households in the sample reported to be living at or below the federal poverty line ($25,000), seven (17.5%) of the households in the sample lived between 100% ($25,000) and 200% ($50,000) of the federal poverty line, and 13 (32.5%) of households reported incomes above 200% ($50,000) of the federal poverty line for a family of four. At the time of the interview, ten (25%) households received Temporary Aid for Needy Families, 21 (52.5%) households received support from the Supplemental Nutrition Assistance Program, ten (25%) households included at least one member who was enrolled in either Medicaid or the State Child Health Insurance Program, eight (20%) households received public assistance housing support such as Section 8 or a related program, 11 (27.5%) households received money for child support from someone living outside of the household, and four (10%) households received money not related to child support from others outside the home to help pay for general expenses.

Child Characteristics. The respondents reported the racial identity of their three-year-old children to be as follows: 11 (27.5%) were African American, 13 (32.5%) were white/Caucasian, seven (17.5%) were Spanish-descent/Latino alone, and nine (22.5%) were identified as multiracial. Fourteen (35.0%) of the children had low-birth weight, were born prematurely at or before 34 weeks, or had a diagnosis at birth that doctors were concerned would

impact their future development. Twenty-six (65.0%) of the children in the sample were not born with any of these three conditions at birth.

Descriptive Statistics

Dependent Variables. Table 2 shows the descriptive statistics for the two continuous dependent variables, number of missed well-child visits and continuity of care (number of primary care office visits attended). From Table 2 we see that very few children missed well-child visits ($\bar{X}$=0.02, median=0, mode=0), with 90% (N=36) of respondents reporting that their children did not miss any of the required well-child visits during the first three years of life. Similarly, few children had more than a single primary care office that they attended ($\overline{X} = 1.23$)

Table 2. Descriptive Statistics for Well-Child Visits Missed and Number of Primary Care Offices Attended During the First Three Years of Life

	N	Min	Max	Mean	Median	Mode	Std Dev
Number of Missed Well-Child Visits	40	0	4	0.02	0	0	0.72
Continuity of Care (Number of Primary Care Offices Attended)	40	1	3	1.23	1	1	0.48

Because of the low degree of variance in the responses for well-child visit attendance and number of primary care offices attended, it was not possible to run the proposed statistical tests to look for patterns in relationship between housing insecurity and these dependent variables. Additionally, only four (10%) of forty subjects reported missing any well-child visits at all. Of those four children, two missed only one appointment, one child was reported to miss two appointments, and one child was reported to miss four appointments out of the total possible 11 appointments attended during the first three years of life.

Table 3. Total Missed Well-Child Visits by Number of Primary Care Offices Attended

N Row % Column %	Number of Primary Care Offices Attended			
Total Missed Well-Child Visits	**1**	**2**	**3**	**Total**
0	29 80.6 90.6	6 16.7 85.7	1 2.8 100	36
1	1 50.0 3.1	1 50.0 14.3	0 0.0 0.0	2
2	1 100.0 3.1	0 0.0 0.0	0 0.0 0.0	1
4	1 100.0 3.1	0 0.0 0.0	0 0.0 0.0	1
Total	32	7	1	40

A crosstabulation showing the total number missed will-child visits with the total number of primary care offices attended during the first three years of life is shown in Table 3. Regarding continuity of care defined as attending visits at the same outpatient pediatric office, 32 respondents (80%) of the forty subjects reported that their child attended the same primary care office for outpatient visits from birth through three-years of age. Of those 32 children who attended the same primary care outpatient office, only 3 children (10%) missed any well-child visits during the first three years of life.

Of the eight children who were reported to attend more than one location for visits, only 1 child was reported to have completely missed any well-child visits. The number of visits the child was reported to have missed was also 1. Therefore, regardless of how continuity of care is defined, as either constancy in the location of outpatient office visits, or as having attended the

full recommended schedule of visits, 39 of the 40 subjects (97.5%) reported to experience continuity in the pediatric outpatient care that they received during the first three years of life.

Table 4. Descriptive Statistics for Health Care Utilization Variables and Parental Awareness of Early Intervention

	Yes	No	N Total
Missed/Rescheduled Any Outpatient Visit	9 (22.5%)	31(77.5%)	40
Urgent Care	17 (42.5%)	23 (57.5%)	40
Emergency Room (ER)	22 (55.0%)	14 (45.0%)	40
Urgent Care & ER	12 (30.0%)	28 (70.0%)	40
EI Awareness	29 (72.5%)	11 (27.5%)	40

Table 4 shows the descriptive statistics for other patterns in health care utilization experienced by the three-year-old children in the sample. Respondents reported whether children ever missed or rescheduled an outpatient visit at the pediatrician's office due to a lack of transportation or a lack of child care. Respondents also reported if they ever attended urgent care centers, emergency rooms, or both places at any point during the first three years of life. Additionally, patterns in parental awareness of Early Intervention are also presented in this table.

There is variability present in the data representing whether children ever attended visits at an urgent care center, emergency room, or in both places during the first three years of life. As shown in Table 4, 17 (42.5%) children visited an urgent care center, 22 (55.0%) children visited an emergency room, and 12 (30.0%) children visited both an urgent care center and emergency room for medical attention during the first three years of life. Additionally, 29 of the 40 respondents (72.5%) were aware of the Early Intervention program.

Independent Variables. Four of the five ways that housing insecurity was operationalized were the primary independent variables utilized in each logistic regression analysis. Table 5 shows the descriptive statistics used to investigate the distribution of the data

Table 5. Descriptive Statistics for Number of Homes Lived In

	N	Min	Max	Mean	Median	Mode	Std Dev
Number of Homes Lived In	40	1	10	2.25	2	1	1.71

representing the number of places that children lived during the first three years of life[3]. The children in the sample lived in between one and ten homes during the first three years of life with the average number of homes being 2.25 (SD 1.71). Therefore, the average moves during the first three years of life was 1.25 moves. Eighteen of the 40 subjects (45%) lived in only one house since birth and therefore did not move residences at any time during the first three years of life.

Table 6 shows the descriptive statistics for the three additional measurements of housing insecurity, namely, the lack of housing affordability, two or more moves in 12 months, and homelessness. Each of these three indicators of housing insecurity are dichotomous variables. Sixteen respondents (40%) worried about being able to pay the rent or mortgage and 15 respondents (37.5%) reported having doubled-up to live with another family or relative for a period.

[3] It should be noted that when omitting one case who reported living in 10 homes during the first three years of their child's life, the maximum number of homes lived in for the remaining 39 cases is 5 homes and the mean, standard deviation, median, and mode change as follows: $\bar{X}$ = 2.05, SD = 1.67, median = 2.00, mode = 1.00. The case was not omitted because the case is not an outlier on any of the other independent or dependent variables.

Table 6. Descriptive Statistics for Nominal Housing Insecurity Variables

	Yes	No	N Total
Affordability Worry	16 (40.0%)	24 (60%)	40
Doubled-up	15 (37.5%)	25 (62.5%)	40
Total Experiencing a Lack of Housing Affordability	24 (60%)	16 (40%)	40
Ever Moved Homes	22 (55%)	18 (45%)	40
Ever Moved 2 or More Times in 12 Months	9 (41.0%)	13 (59.1%)	22
Homelessness	5 (22.7%)	17 (77.3%)	22

Approximately 60% of the sample (N=24) experienced some form of a lack of housing affordability identified as doubling up or being worried about being able to pay rent or a mortgage bill. About 40% of the sample (N=9) who reported ever moving homes also reported having moved two or more times in any 12-month period. Of the same subgroup of subjects reporting having ever moved homes, 22.7% of the sample (N=5) reported that at some point during the first three years of their child's life, they experienced homelessness.

Reasons for moving. The fifth indicator of moving planned to be utilized in this study was principal component variables created from the reasons for moving data reported by the sample. Due to the relatively large number of reasons for moving (14 choices) compared to the small subset of N=22 families who reported moving, the resulting principal components did not yield an intelligible pattern of reduced eigenvectors.

There were fifteen reasons for moving in the original survey questionnaire (See Table 1 in Chapter Two for the push and pull classifications of the reasons for moving. See Q10.13 in

Appendix B for the full list of reasons for moving utilized in the data collection interview.) Each subject's list of reasons for moving were recoded into a single datapoint indicating that the subject responded with push-only reasons, push and pull reasons for moving, or pull-only reasons for moving.

Twenty-two of the 40 subjects moved homes at least one time during the first three years of their child's life. Of the 22 subjects who moved, five reported only one reason for moving. Reasons for moving listed by these five subjects included the following: one subject moved to be closer to family and friends, two subjects moved due to the birth of a child, and two subjects moved because of either wanting their own space or wanting to own a home. The remaining 17 subjects noted between two and ten reasons for moving.

Of the total number of subjects who reported moving (N=22), seven respondents reported pull-only reasons for moving, ten respondents reported both push and pull reasons for moving, and five respondents reported push-only reasons for moving. Out of 22 total respondents who moved, eleven (50%) respondents reported that one of the reasons that they moved was due to a highly urgent situation, namely, due to a foreclosure or eviction or due to domestic violence. The recoded reasons for moving data was not utilized in any of the logistic regression analyses since only 55% of the total study sample (N=22) reported any reasons for moving.

Control Variables. Parent concern about their child's development and children's health status at birth were utilized as control variables in separate regression equations. Twenty-six (65.0%) of respondents reported having a concern about their child's development at some point during the first three years of their child's life. A total of fourteen (35%) of the respondents' children met criteria to be included as having had a health status at birth that may have qualified them to receive Early Intervention services. These fourteen children met some or all of the

following criteria: having been born at or below 5.5 pounds (low-birth weight), having been born at or before 34 weeks gestation (prematurity), or having been born with a diagnosis or condition that doctors were concerned would negatively impact their later health or development.

Other Variables. Additionally, seventeen respondents (42.5%) reported that a medical clinician at their child's primary care office had concerns about their child's development at some point during the first three years of life. Ten of the twenty-nine respondents (34.8%) with awareness of Early Intervention also reported receiving information about the Early Intervention program from a provider in their child's primary care office. Eight of the ten children (80.0%) whose primary caregivers received information about Early Intervention from a pediatric medical provider reported making a call to the Early Intervention office to find out more about the program. Six of the eight respondents (75.0%) who called the Early Intervention program also reported that their child eventually enrolled in Early Intervention services.

Housing Insecurity and Parental Awareness of the Early Intervention Program

Logistic regression analyses were used to test the relationship between housing insecurity variables and parental awareness of the Early Intervention Program. A series of three logistic regression analyses were conducted with each housing insecurity variable. The results of these analyses are shown in Table 7. In the first column, each housing insecurity indicator variable was regressed onto parental awareness of Early Intervention on its own. In the second column, each housing insecurity indicator was regressed onto parental awareness of EI controlling for parent concern about their child's development. In the third column, each housing insecurity indicator was regressed onto parental awareness of EI controlling only for children's health at birth.

Table 7. Logistic Regression Results of Housing Insecurity on Parental Awareness of Early Intervention

	1		2		3	
	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio
Number of Homes Lived In [a.]	-0.09 (0.20)	0.91	-0.13 (0.21)	0.77	-0.07 (0.20)	0.93
Parent Concern	--	--	1.20 (0.75)+	3.33	--	--
Child Health at Birth	--	--	--	--	0.44 (.79)	1.56
2+ Moves in 12 Mo. (Y/N) [a.]	-.036 (082)	0.70	-0.62 (0.87)	0.54	-0.29 (0.83)	0.75
Parent Concern	--	--	1.25 (0.76)+	3.48	--	--
Child Health at Birth	--	--	--	--	0.45 (0.79)	1.57
Lack of Affordability (Y/N) [a.]	-2.37 (1.11)*	0.09	-2.43 (1.14)*	0.09	-2.34 (1.12)*	0.10
Parent Concern	--	--	1.23 (0.81)	3.42	--	--
Child Health at Birth	--	--	--	--	0.25 (0.85)	1.28
Homelessness (Y/N) [b]	11.71 (231.0)	>999.99	--	--	--	--
Parent Concern	--	--	--	--	--	--
Child Health at Birth	--	--	--	--	--	--

+ p<.1; * p<.05; ** p< .01.

Note: Parent Concern represents respondents who ever had concerns about their child's development at any point during the first three years of life. Child Health at Birth represents children who were born with any of the following conditions: low-birth weight, prematurity, or having a medical condition or diagnosis that providers were concerned could impact the child's development.

[a.] When the outlier case is omitted, the data remains the same for all columns.

[b] For both the full data set and when the outlier case is omitted, all respondents who reported experiences of homelessness also reported awareness of the EI program. Therefore, the regression analyses are invalid due to a lack of variability in the relationship among the predictor variables and the dependent variable resulting in large standard errors and invalid odds ratios.

Neither parent concern (p=0.12) nor child health at birth (p=0.53) showed a statistically significant relationship when regressed independently onto parental awareness of EI in their own independent bivariate logistic regression analyses. Neither the frequency of moves nor moving

two or more times in a 12-month period were statistically significant when included in independent, bivariate logistic regression analyses exploring each housing insecurity indicator's impact on the likelihood of parental awareness of EI.

However, parental concern about their child's development was statistically significant when it was included as a control variable in the regression analyses examining the impact of two or more moves in one year and the number of houses lived in on parental awareness of the Early Intervention program. Respectively, parents who had a concern about their child's development were 3.33 and 3.48 times as likely as parents without concerns to be aware of the Early Intervention program when controlling for the frequency of moves or having moved two or more times in any 12-month period.

Lack of affordability of housing was the only indicator of housing insecurity that remained statistically significant at a $p<0.05$ level in each of the models. Children who experienced a lack of affordability of housing had increased likelihoods that parents were not aware of the Early Intervention program in all three logistic regression analyses. Specifically, children who experienced a lack of affordability during the first three years of life were 9.0% as likely ($p=0.033$) to have parents who were aware of the Early Intervention program compared to parents of children who did not experience a lack of affordability during the first three years of their child's life. The relationship did not change when controlling for parental concern about their child's development. When controlling for children's health at birth, children experiencing a lack of affordability of housing had parents who were 10% as likely ($p=0.036$) to be aware of EI compared to those who did not report housing affordability issues.

Racial Disparities in Parental Awareness of Early Intervention

Chi-square tests for independence were also run to test for differences among children of differing racial identities in health care utilization patterns and in parental awareness of the Early Intervention program. Children who identified as multiracial (N=9, 22.5% of the sample) were disproportionately more likely to have parents who were not aware of the Early Intervention program when compared with children of all other racial identities (X^2 (DF=1, N=40) = 4.58, p=.030.) Additionally, children who identified as white were more likely to have parents who were aware of the Early Intervention program when compared with children of all other racial identities (X^2 (DF=1, N=40) = 7.31, p=.007). All of the parents of children who were identified as white also reported awareness of the EI program. Due to the lack of variability of the data, the logistic regression examination of the association children who identify as white and parental awareness of EI could not be computed.

Table 8 shows the b-coefficients and odds ratios for three sets of logistic regression analyses done to examine the magnitude of racial disparities in parental awareness of EI for multiracial children alone and for multiracial and African American children included as variables in the same model. The rational for including African American children and multiracial children in the same regression analyses is that eight of the nine children who were identified as multiracial had parents who identified that their children were both African American and an additional racial category. One of the nine children identified by the respondent as multiracial was reported to identify as white and Latinx.

The first column shows the b-coefficients, standard deviations, and odds ratios of parental awareness of EI for each racial group. The second column shows same results for each racial

group on parental awareness of EI controlling for parental concern about their child's development. The third column shows the results for each racial group of the likelihood of parental awareness of EI controlling for children's health at birth.

Table 8. Logistic Regression Results of Racial Disparities in Parental Awareness of Early Intervention

	1		2		3	
	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio
Multiracial	-1.65 (0.81)*	0.19	-1.47 (0.83)+	0.23	-1.61 (0.82)*	0.20
Parent Concern	--	--	0.91 (0.77)	2.49	--	--
Child Health at Birth	--	--	--	--	0.29 (0.82)	1.33
Multiracial [a.]	-2.42 (1.11)*	0.09	-2.26 (1.03)*	0.10	-2.45 (1.02)*	0.09
African American [a.]	-1.64 (0.97)+	0.19	-1.74 (1.00)+	0.18	-2.03 (1.07)+	0.13
Parent Concern	--	--	1.04 (0.82)	2.81	--	--
Child Health at Birth					0.93 (0.92)	2.53

+ p<.1; * p<.05; ** p< .01.

Note: Parent Concern represents respondents who ever had concerns about their child's development at any point during the first three years of life. Child Health at Birth represents children who were born with any of the following conditions: low-birth weight, prematurity, or having a medical condition or diagnosis that providers were concerned could impact the child's development.

[a.] The reference group racial categories include children identifying as white and children identifying as Latinx-only.

Multiracial children were 19% as likely to have parents who were aware of the Early Intervention program (p=0.040) compared to children of all other racial groups. When controlling for parental concern about children's development (b=0.91, p=0.241), multiracial children were 23% as likely to have parents who were aware of the EI program (p=0.078) compared to children of all other races. When controlling for children's health at birth (p=0.727), multiracial children remained 20% as likely (p=0.049) to have parents who were aware of the EI program compared to children of all other races.

When examining for racial disparities in parental awareness of EI by including children identified as multiracial and children identified as African American in the logistic regression analysis, multiracial children became 8.90% as likely to have parents who were aware of EI (p=0.016) compared to children who were identified as white or Latinx-only. Additionally, the likelihood of awareness among parents of African American children became statistically significant (p=0.093) with African American children being 19.4% as likely to have parents who were aware of EI compared to children who were identified as white or Latinx-only.

In the bottom row of column 2, with multiracial children and African American children both included in the analysis, parental concern about children's development was not statistically significant (p=0.209). However, parents of multiracial children became 10.4% as likely to be aware of EI (p=0.027) and parents of African American children became 17.6% as likely to be aware of EI (p=0.083) compared to parents of children who were identified as white or Latinx.

In column 3, children's health at birth was not a statistically significant predictor of parental awareness of EI in either of the two regression models. However, when controlling for children's health at birth in the top row of column 3, multiracial children remained approximately 20% as likely to have parents who were aware of EI and this likelihood became significant at a more robust level (p=0.049). In the bottom row of column 3, compared to parents of white children and Latinx children, parents of multiracial children became even less likely to be aware of EI (p=0.016, OR=0.086) compared to the model in the top row of the same column. Additionally, compared to parents of white and Latinx children, parents of African American children became 13.1% as likely to be aware of EI (p=0.057).

Racial Disparities in Birth Health Status

Two-by-two cell chi-square test for independence were run to discover if there were significant differences among children of different racial identities in the presence of a health status at birth, namely, low-birth weight, prematurity, or a severe developmental delay or health condition, which doctors were concerned could impact their future development. Of the total sample of 40 subjects, 14 (35%) reported that their children had one or more of the three health conditions at birth. Of the 14 subjects, seven children identified as African American and three identified as white, two identified as Hispanic, and two identified as multiracial. Comparing children who identified as African American with children of all other racial identities, a disproportionately higher frequency of African American children were born with one of the three health conditions at birth that doctors were concerned could impact their development, (X^2 (DF=1, N=40) = 5.47, p=.02).

Table 9. Logistic Regression Results of Racial Disparities in Child Health at Birth

	Child Health Status at Birth		Low Birth Weight		Prematurity		Concerning Diagnosis	
	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio
African American [a.]	1.70 (0.76)*	5.50	1.60 (0.87)+	4.95	2.77 (1.20)*	16.00	1.39 (0.78)+	4.00

+ p<.1; * p<.05; ** p< .01.

Note: Child Health Status at Birth represents subjects who were born with the presence of any of the three conditions at birth that would have likely resulted in automatic eligibility for the Early Intervention Program. Low Birth Weight represents subjects who were born at or less than 2.2lbs. Prematurity represents subjects born at or before 34 weeks gestation. Concerning Diagnosis represents children who were born with a diagnosis or condition that doctors were concerned would negatively impact the children's later development.

[a.] The reference group racial categories include children identifying as multiracial, Latinx, and white.

Logistic regression analyses were used to determine the magnitude of the difference in the likelihood of African American children compared to children of all other races of being born with low birth weight, prematurity, or a concerning diagnosis or condition. Table 9 shows the b-coefficients and odds ratios of a series of logistic regression analyses for different birth health outcomes for African American children compared to children of all other racial identities.

African American children in the sample were 5.5 times as likely as children of all other racial identities to be born with one of these three health conditions at birth (p=0.025). Specifically, African American children in the sample were 16.00 times as likely (p=0.020) to be born prematurely at or before 34 weeks gestation and were 4.95 times as likely (p=0.067) to be born with low birth weight compared to children of all other racial identities. African American children were also 4.00 times as likely (p=0.076) to be born with a diagnosis that doctors were concerned would negatively impact their future development. None of the other subgroups of children of other racial identities, when compared to children of all other racial identities, had significantly different instances of low birth weight, premature birth, or a concerning health condition or diagnosis at birth that doctors were concerned about would negatively impact their future development.

Housing Insecurity and Health Care Utilization Patterns

In this section, I report the results of logistic regression analyses used to test the hypotheses that various forms of housing insecurity significantly influence health care utilization patterns during first three years of life. Because so few children missed well-child visits (see Table 3), the relationship between housing insecurity indicators and well-child visits could not be tested. The results of logistic regression analyses showing the impact of housing insecurity indicators on the likelihood of urgent care and emergency room visit use and on the likelihood of

missed or rescheduled outpatient pediatric visits due to gaps in access to transportation or childcare are presented in the next sections.

Housing insecurity on urgent care or emergency room visit use. Table 10 shows the b-coefficients, standard errors, and odds ratios for three separate logistic regression analyses. Column 1 shows the results for each of the bivariate variations of the housing insecurity variables on the likelihood of having ever attended a visit at an urgent care center (UC) or emergency room (ER) during the first three years of life. Column 2 shows the results for the regression of each housing insecurity indicator controlling for parental concern about their child's development on likelihood of attending a visit at a UC center or ER. Column 3 shows the results of the bivariate regression of each housing insecurity indicator controlling for child health at birth on the likelihood of attending a visit at a UC center or ER. Independently, neither parental concern ($p=0.91$) nor child health at birth ($p=0.18$) were significant predictors of whether children ever attended an urgent care or emergency room visit during the first three years of life.

The only housing insecurity indicator with a statistically significant relationship as a predictor of children ever having attended urgent care or emergency room visits was the lack of affordability of housing. As shown in Table 9, respondents who reported experiencing a lack of affordability of housing were 3.89 times as likely than those who did not experience a lack of affordability to have children who attended urgent care or emergency room visits ($b=1.36$, $SE = 0.74$, $p<0.10$). When controlling for parent concern about their child's development, the lack of affordability remained a statistically significant predictor of the likelihood of UC or ER use ($b=1.37$, $SE=0.75$, $OR=3.95$, $p<0.10$).

Table 10. Logistic Regression Results for Housing Insecurity on Urgent Care or ER Visit Use

	1		2		3	
	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio
Number of Homes Lived In [a.]	-0.13 (0.20)	0.88	-0.14 (0.20)	0.87	-0.09 (.20)	0.92
Parent Concern	--	--	0.13 (0.75)	1.14	--	--
Child Health at Birth	--	--	--	--	1.10 (0.88)	3.01
2+ Moves in 12 Mo. (Y/N) [a.]	-0.36 (0.82)	0.70	-0.39 (0.83)	0.68	-0.21 (0.84)	0.81
Parent Concern	--	--	0.13 (0.75)	1.14	--	--
Child Health at Birth	--	--	--	--	1.13 (0.87)	3.01
Lack of Affordability (Y/N) [a.]	1.36 (0.74)+	3.89	1.37 (0.75)+	3.95	1.70 (0.82)*	5.45
Parent Concern	--	--	0.19 (0.78)	1.21	--	--
Child Health at Birth	--	--	--	--	1.58 (0.95)+	4.87
Homelessness (Y/N) [a.b.]	0.47 (1.18)	1.60	--	--	0.43 (1.20)	1.54
Parent Concern	--	--	--	--	--	--
Child Health at Birth	--	--	--	--	1.15 (0.87)	3.15

+ p<.1; * p<.05; ** p< .01.

Note: Parent Concern represents respondents who ever had concerns about their child's development at any point during the first three years of life. Child Health at Birth represents children who were born with any of the following conditions: low-birth weight, prematurity, or having a medical condition or diagnosis that providers were concerned could impact the child's development.

[a.] When the outlier case is omitted, the data remains the same in all columns.

[b.] In column 2, for the full data set and omitting the outlier, the regression analyses could not be run due to a lack of variability in the relationship among the predictor variables.

However, when the lack of affordability was regressed onto the likelihood of urgent care or emergency room visit use controlling for child health at birth, children who experienced a lack

of affordability were 5.45 times as likely than those without affordability issues to have attended an urgent care or emergency room visit during the first three years of life (b=1.70, SE=0.82, $p<0.05$). Child health status at birth became significant at the $p < 0.10$ level when included in the regression along with the variable representing a lack of affordability of housing. Children who were either low-birth weight, premature, or had a developmental or physical health condition at birth were 4.87 times as likely than children without these health conditions at birth to have attended an urgent care or emergency room visit during the first three years of life when controlling for the impact that lack of affordability has on the likelihood of urgent care or emergency room visit use.

All subjects who reported that their child experienced homelessness also reported having concerns about their children's development and 100% of this subgroup of respondents also reported that their child attended either urgent care or an emergency room visit. Therefore, the second bivariate analysis of homelessness on urgent care or emergency room visit use controlling for parental concern is invalid due to the lack of variability the two regressors in the model and the dependent variable.

Housing insecurity and missed visits due to lack of child care or transportation. All 40 subjects were asked if their children ever missed or rescheduled an outpatient appointment due to a either a lack of child care for siblings or a lack of transportation. Table 11 shows the results of a series of three logistic regression analyses assessing the relationship between each of the four indicators of housing insecurity on the likelihood of having missed or rescheduled an outpatient visit due to the lack of child care or transportation.

Three of the four indicators of housing insecurity in column 1 namely, the number of homes lived in (OR=2.17, $p<0.05$), moving two or more times within any twelve-month period

(OR=4.16, p<0.10), and homelessness (OR=7.25, p<0.05), were significant predictors of the likelihood of missing or rescheduling an outpatient visit due to the lack of transportation or the lack of child care. The odds ratios for two of these three indicators of housing insecurity, namely, the number of homes lived in (OR=2.55, p<0.05) and moving two or more times within any twelve-month period (OR=6.72, p<0.05), increased in magnitude in column 2 when controlling for parent concern of their child's development. Additionally, in column 3 when controlling for child's health status at birth, the number of homes lived in (OR=2.08, p>0.10), and having lived in 2 or more homes within any twelve-month period (OR=3.67, p>0.10), were no longer statistically significant predictors of having missed or rescheduled outpatient visits due to a lack of child care or transportation.

The lack of affordability of housing was not a significant predictor of the likelihood of missing or rescheduling an outpatient medical visit in any of the three columns of regression equations. On their own, neither parent concern about their child's development (p=0.15) nor children's health status at birth (p=0.12) were significant predictors of the likelihood of missing or rescheduling an outpatient visit due to a lack in access to child care or a lack in access to transportation. Additionally, although there were significant relationships between a number of the indicators of housing insecurity and missed or rescheduled outpatient visits due to lack of resources, only four of the nine subjects (44.4%) who reported missing visits due to a lack of child care or transportation

Table 11. Logistic Regression Results of Housing Insecurity on Missed Outpatient Visit due to Lack of Transportation or Child Care

	1		2		3	
	b (SE)	Odds Ratio	b (SE)	Odds Ratio	b (SE)	Odds Ratio
Number of Homes Lived In[a]	0.77 (0.35)*	2.17	0.93 (0.41)*	2.55	0.73 (0.36)	2.08
Parent Concern	--	--	-1.80 (0.97)+	0.17	--	--
Child Health at Birth	--	--	--	--	-1.49 (1.17)	0.23
2+ Moves in 12 Mo. (Y/N) [b]	1.43 (0.83)+	4.16	1.91 (0.97)*	6.72	1.30 (0.86)	3.67
Parent Concern	--	--	-1.60 (0.92)+	0.20	--	--
Child Health at Birth	--	--	--	--	-1.64 (1.14)	0.19
Lack of Affordability (Y/N)	1.06 (0.88)	2.88	1.04 (0.90)	2.82	0.92 (0.91)	2.52
Parent Concern	--	--	-1.10 (0.79)	0.33	--	--
Child Health at Birth	--	--	--	--	-1.66 (1.31)	0.19
Homelessness (Y/N) [c]	1.98 (1.02)*	7.25	--	--	--	--
Parent Concern	--	--	--	--	--	--
Child Health at Birth	--	--	--	--	--	--

+ p<.1; * p<.05; ** p< .01.

Note: Parent Concern represents respondents who ever had concerns about their child's development at any point during the first three years of life. Child Health at Birth represents children who were born with any of the following conditions: low-birth weight, prematurity, or having a medical condition or diagnosis that providers were concerned could impact the child's development.

[a.] When the outlier case is omitted, the data remains the same for columns 1 and 2. In column 3, the number of homes lived in becomes significant (b=0.72, SE=0.37, OR=2.06, p=0.053) and the control variable remains not significant.

[b] When the outlier case is omitted, the variable two or more moves in any 12-month period loses significance in columns 1 and 2 while remaining not significant in column 3. The control variables remain the same as are represented in the table above.

[c] When the outlier case is omitted, the variable homelessness becomes not significant in column 1. In columns 2 and 3, for both the full data set and with the outlier omitted, all respondents who reported experiences of homelessness had concerns about their children's development and had children born with one of the three health conditions at birth that doctors were concerned would impact their later development. Therefore, the regression analyses could not be run due to a lack of variability in the relationship among the predictor variables.

also responded that the gap in access to these resources were due to housing status

changes occurring around the same time as the missed or rescheduled visit.

Racial disparities in health care utilization. Logistic regression analyses were run to examine for racial differences in the likelihood of each health care utilization outcome variable. White children in the sample were significantly less likely than were children of all other racial identities to attend UC or ER visits (b=-1.33, SE=0.75, OR=0.265, p=0.075). There were no significant differences found among multiracial children, African American children, or Latinx children in the likelihood of visiting urgent care or an emergency room when comparing each racial group to children in all other racial groups. These findings remained the same when controlling for children's health at birth and parental concern about children's development in separate models. These results are not being reported in a table. Due to the small number of overall children in the sample whose guardians reported that their children ever missed or reschedule an outpatient visit due to loss of transportation or childcare, racial differences in the likelihood of experiencing this health care utilization outcome measure could not be tested.

Chapter Seven – Discussion and Implications

In this chapter, I interpret the findings and discuss the implications of the study. The discussion is presented in three sections. First, I discuss limitations of the study design and data collection process resulting in the small size of the dataset and threats to statistical conclusion validity. Second, I present an interpretation of the findings. Lastly, I present implications for social work practitioners, researchers, and policy makers working with families with infants and toddlers who may be experiencing different forms of housing insecurity.

Limitations

Study design limitations. Due to a lack of access to pediatric medical records with primary source data on children's health histories and well-child visit attendance histories, I chose a cross-sectional, retrospective study design using a pilot-tested, semi-structured telephone script to interview parents of three-year-old children. Gathering historical data in an interview format about children's health status at birth and health care utilization patterns during the entire first three years of children's lives poses challenges to the validity of the data collected. Interviewing respondents about details pertaining to a period of life after the birth of their child through the early toddler years, a time that may have been filled with normative sleep deprivation or other general parenting stressors, poses the risk that respondents will experience response recall bias or social desirability bias. The responses collected may have been influenced by recall bias whereby respondents may have inaccurately recalled information about actual events that occurred in the past due to general memory decay (Althubaiti, 2016). Additionally, research subjects may have been influenced by social desirability bias causing respondents to give inaccurate information due to fears of being negatively judged if they were to share the true answer to the question asked by the interviewer (Althubaiti, 2016). For

example, social desirability bias may have caused respondents to be less likely to report that their children missed any well-child visits during the first three years of their lives. These forms of response bias related to study methodology could be avoided in future studies by acquiring permission to conduct retrospective or prospective data collection of well-child visit attendance records directly from children's medical health records.

Recruitment strategy limitations. Initially, I had hoped to train a research assistant willing to volunteer to assist me with study recruitment. However, without funding to support this role, I was unable to find someone willing to fulfill these duties. Due to difficulties finding a research assistant and due to other reasons, the study recruitment goal began at 250 subjects, reduced to 100 subjects, and completed with a total of forty subjects in the sample.

The target sample size also continued to reduce due to delays in initiating recruitment procedures. Delays occurred due to the level of complexity required to obtain administrative approval to recruit parents of three-year-old children from early child care centers that were contracted by school districts to provide free, Universal Pre-Kindergarten programming to families in their jurisdiction. Multiple levels of approval at the school district and at early child care centers were required to be obtained before recruitment activities were permitted to begin. The theoretical population of parents of three-year-old children enrolled in Universal Pre-Kindergarten programs through the school district(s) was close to 1,200. Children were located throughout Rochester, NY and Monroe County at multiple different program sites. I ended up engaging with seven sites theoretically serving about 300 children in the three-year-old Universal Pre-Kindergarten program.

The actual population of three-year-old children in Universal Pre-Kindergarten classes serving three-year-old children was also less than expected. At any given time in the fall period

of the academic year, a portion of the children in the three-year-old classrooms were just below three-years old, making their parents ineligible for study recruitment. In the spring, a portion of the three-year-old children already had turned four-years-old and therefore their parents were no longer eligible for the study. Additionally, absences of children from classrooms due to sickness and other reasons meant that on days when I recruited in person, even fewer children's parents were available to engage with me in passing as they picked-up or dropped-off their children from daycare classrooms.

Despite the recruitment strategy and process limitations, I achieved a 58% recruitment rate which was higher than the 30% participation rate anticipated at the outset of the data collection process. Therefore, of the parents of three-year-old children who I did engage with, a relatively large percentage of them continued to become study participants. Nonetheless, the small sample size of forty subjects limited my ability to draw statistical conclusions about the hypotheses that I formulated in response to the primary study questions. A discussion of the results and implications of the threat to statistical conclusion validity caused by the small sample size is presented in the next section.

Discussion

Review of study aims and primary findings. The primary aim of this project was to provide a developmentally-contextual exploration of the impacts of different patterns of housing insecurity, a social determinant of health, on parental awareness of EI during the first three years of children's lives, a well-studied period of foundational, but not deterministic developmental sensitivity and growth (National Scientific Council on the Developing Child, 2007; Shonkoff & Phillips, 2004). As presented in the introductory chapter, few studies have explored factors that may be simultaneously occurring, external to parental beliefs and decision-making processes,

that may also precede and influence known underutilization of the Early Intervention program (EI) among low-income children (Rosenberg, Robinson, et al., 2013) and known patterns of racial disparities in utilization of EI among African American children (Feinberg et al., 2011; Tang et al., 2012). Therefore, in Chapters 2 and 3, I illustrated the primacy of exploring the impacts of housing insecurity on pediatric health care utilization patterns and on parental awareness of EI due to the known associations of housing insecurity with gaps in utilization of health care services (Ma, Gee, & Kushel, 2008) and due to associations between more extreme forms of housing insecurity with poor health outcomes and higher developmental risk in young children (Cutts et al., 2011; Sandel et al., 2018).

I also utilized a social determinants of health and health equity lens, as contextualized in Figures 3 and 4 in Chapter 4, to highlight two interdependent pathways illustrating the association between housing insecurity, an upstream social determinant of health, with various downstream factors that more proximally are hypothesized to influence the target outcome in question, parental awareness of EI. In one pathway, I hypothesized that housing insecurity may cause gaps in access to transportation and child care which may disrupt children's ability to attend routine medical visits where children receive developmental screening and parents have opportunities to learn information about EI.

In the second pathway, I hypothesized that housing insecurity, through gaps in access to resources and missed medical visits, may disrupt children's access to continuity of care, a feature of medical homes known to improve children's health outcomes and reduce the need for care due to acute circumstances (Garg & Dworkin, 2016; Strickland et al., 2011). In this second pathway, I further hypothesized that lack of continuity of care would be the primary downstream factor that most proximally impacted the likelihood of parental awareness of EI. Furthermore, given

what is known about the importance of children's health characteristics and parental attitude and belief about the perception of need for services in children's voluntary support program participation (McCurdy & Daro, 2001), parental concern about children's development and children's health at birth were established as important control factors in both pathways.

The importance of examining the sample for racial disparities in the likelihood of parental awareness, regardless of the presence of housing insecurity, was also included in this exploratory study of parental awareness of EI due to past findings that a lack of program awareness may hinder underserved populations from gaining access to voluntary support programs (Boag-Munroe & Evangelou, 2012). Additionally, knowing that studies have found racial disparities in utilization of EI such that, even when controlling for diagnostic similarity and socioeconomic factors, African American children have been found to be less likely than children of other racial identities to utilize EI (Tang et al., 2012; Wang et al., 2009), this study also explored the sample for patterns of racial disparities in some of the experimental variables within the proposed SDH framework that may be related in some way to future, known patterns of underutilization of EI. Specifically, I tested for racial disparities in birth health outcomes and patterns of health care utilization, controlling for parental concern about children's health and children's health status at birth.

In the following sections, I present the implications of the primary findings from the analyses designed to address these hypotheses and provide insight into the primary research questions presented in Chapter 5. All of the findings are presented within the context of the observation that the children in the study sample experienced continuity of care, either through full adherence to all well-child visits or through attending the same office location for outpatient pediatric visits during the first three years of their lives. First, I present the implications of the

findings that some forms of housing insecurity resulted in parents being significantly less aware of EI while other forms of housing insecurity resulted in parents being significantly more aware of EI when compared to families who do not experience these specific indicators of housing insecurity, even when controlling for parental concern about children's development and children's health at birth. Next, I present the implications of the findings that parents of African American children and multiracial children were less likely to be aware of EI, despite controlling for parental concern about children's development and children's health at birth. I also present the implications of the findings that African American children in the sample had significantly worse birth health characteristics compared to children of all other racial identities.

In the final sections, I discuss the implications of the findings related to the impact of different indicators of housing insecurity on the likelihood of urgent care (UC) or emergency room (ER) visit use and on the likelihood of having missed and rescheduled a pediatric outpatient medical visit. I also discuss the implications of all of the findings for practitioners, researchers, and policy makers interested in using a social determinants of health framework and health equity lens to improve access to and utilization of Early Intervention program services among known populations of potentially eligible yet underserved children.

Housing insecurity on parental awareness of EI. The first set of findings involves the hypotheses that families experiencing housing insecurity would be less likely than families who did not experience housing insecurity to be aware of parental awareness of the EI program. Although it was hypothesized that differences in likelihood of parental awareness among children who experience housing insecurity compared to those who do not experience housing insecurity would be because of significant associations between housing insecurity and a lack of

continuity of care, disrupting children's access to developmental screenings and parents' access to information about EI, the study findings suggest an alternative hypothesis is needed.

The study findings suggest that both less extreme and more extreme forms of housing insecurity may impact parental awareness of EI through pathways not related to continuity of pediatric care. Children who experienced a lack of housing affordability, a less extreme form of housing insecurity, were less likely to have parents who were aware of EI compared to children who did not experience this form of housing insecurity. However, children who experienced homelessness, a more extreme form of housing insecurity, were more likely than children who did not experience this form of housing insecurity to have parents who were aware of EI.

As presented in Table 7 of Chapter 6, the number of homes lived in and two or more moves within any 12-month period of life of had no significant impacts on parental awareness of EI. However, all children who were reported to have experienced homelessness had parents who were aware of the Early Intervention program. Additionally, parental concern about children's development became a significant, positive predictor of parental awareness when added to the models examining the impact of the frequency of residential moves or having moved two or more times in any 12-month period on the likelihood of parental awareness of EI.

Taken together, the study findings suggest that among families experiencing forms of residential mobility that are not measured explicitly for their association with homelessness, when comparing those who move with those who do not move, parental concern about their child's development is more likely to influence parental awareness of EI than is the variable representing having moved. However, since parental concern on its own was not a significant predictor of parental awareness of EI in the study sample but did become significant when added as a control variable to separate models examining the impact of frequency of homes lived in and

moving twice or more in a 12-month period on parental awareness of EI (See the second column of Table 7 in Chapter Six), these findings also indicate that there may be other factors associated with the conditions surrounding moving in combination with the presence of parental concern about their children's development that lead to higher likelihoods of awareness of EI among these parents.

Due to limitations in sample size, I was not able to control for children's health status at birth and parental concern in the same model. However, literature on the association of residential mobility in early childhood and health outcomes would suggest that there may be a bidirectional relationship between the associations among residential mobility and parental concern about children's development among the children in the study sample. As presented in various conceptual frameworks and research studies examining the pathways of influence and impacts of residential mobility on child health outcomes (Anderson, Leventhal, & Dupéré, 2014b; Jelleyman & Spencer, 2008; Murphey et al., 2012), children experiencing residential mobility compared to those not experiencing residential mobility may be more likely to display developmental, behavioral, health, or psychological symptoms, prompting parental concern for children's development and subsequent initiation of health information and service seeking behaviors on the part of parents. Future studies should control for the transactional influence of diagnostic differences along all developmental domains that, together with parental concern, may better explain patterns in parental awareness of EI among low-income children who experience multiple moves during the first three years of life.

Additionally, while frequency of moves and moving twice or more in a 12-month period were not significant predictors of parental awareness of EI independently, all of the children who experienced homelessness in the study sample had parents who were aware of the EI program.

Taken together, these findings indicate that there may be other pathways of influence between extreme forms of residential mobility leading to homelessness and the likelihood of parental awareness of EI, even when continuity of care remains consistent. Evidence for a different pathway of influence between homelessness and parental awareness of EI is supported by literature that homelessness, the most extreme form of housing insecurity, may present families with additional opportunities to be connected with services and information to support their children's development (Grant et al., 2013; L Bassuk, J DeCandia, Tsertsvadze, & Richard, 2014; Shinn, Samuels, Fischer, Thompkins, & Fowler, 2015). Future studies of parental awareness of EI should account for parental interactions with additional service systems, outside of health care settings, through which parents may gain access to information about the Early Intervention program to support their children's development.

Further research is needed to clarify the relationship among parental concern about children's development, indicators of residential mobility as a form of housing insecurity with and without periods of homelessness, children's health status throughout the first three years of life, and parental awareness of EI in order to develop a better understanding of the exploratory observations resulting from this study. Due to the small sample size in this study, reasons for moving could not be explored for their relationship with frequency of moves and resulting impact on the likelihood of parental awareness of EI.

However, 50% (N=11) of the respondents who reported moving stated that one of the reasons for moving was due to a highly urgent situation of eviction, foreclosure, or domestic violence which are situations known to be associated with exposure to toxic stress (Hutto & Viola, 2014; McEwen & McEwen, 2017). Exposure to toxic stress has known to have detrimental impacts on children's health and development (Middlebrooks & Audage, 2008;

National Scientific Council on the Developing Child, 2014). Therefore, to ensure that residentially mobile children, specifically those who are exposed to toxic stress through the context and reasons surrounding their moves, are among the population of children whose parents are aware of EI, the relationship between specific reasons for moving and the likelihood of parental awareness of EI during the first three years of children's lives warrants focused attention in future research.

Regarding the exploration of indicators of housing insecurity experiences not specifically accounting for residential moves, the study findings indicate that children whose parents reported a lack of affordability of housing at some point during the first three years of life were significantly less likely to be aware of the Early Intervention program than were parents who did not report experiencing housing affordability issues. The lack of affordability of housing, a variable making up a composite of respondents who reported experiencing overcrowded housing or at any point worried about being able to pay the rent or mortgage, was related to parental EI awareness, with and without controls.

Furthermore, since by default continuity of care was experienced almost universally by all subjects, these findings indicate that the association between experiences of housing unaffordability and the significantly increased likelihood of lacking parental awareness of EI occurred independently of the hypothesized mediating relationship of achieving continuity of care in pediatric outpatient settings. These findings indicate that even when controlling for parental concern which was not a statistically significant predictor in the model, parents of children experiencing housing unaffordability, measured by being unable to afford the rent or mortgage, or, ever having had to double up to live with another family member, were less likely

to be aware of EI compared to children of who did not experience either of these two forms of housing unaffordability.

More research is needed to determine whether there are other factors within the pediatric encounter, factors related to the severity of children's health statuses at the time of the concern, factors related to parental attitude or belief about the concerns they have about their children, or factors unrelated to the pediatric encounter or children's health that influence the significant lack of awareness of EI among families with this specific form of housing insecurity.

Racial disparities in parental awareness of EI and birth health characteristics. Upon further investigation of patterns of parental awareness of EI among parents of children of different racial identities (See Table 8 in Chapter Six), the study findings indicate that there were significant differences in parental awareness of EI among some racial groups compared to others in the study sample. Specifically, I found that while parents of white children were more likely to be aware of EI compared to children of all other racial identities, parents of multiracial children consistently experienced significantly lower likelihoods of parental awareness of EI than children of all other racial identities, even when controlling for parental concern about children's development or children's health at birth. Additionally, the significant differences in parental awareness of EI found among parents of children who identified as multiracial and the discovery that eight of the nine children identified as multiracial were reported to be African American in combination with one other racial identity justified the exploration of including both African American and multiracial children in a new regression model. As shown in Table 8 in Chapter 6, I explored whether there is a significant change in the magnitude or significance level of the relationship between being African American or multiracial compared to being white or Latinx on parental awareness of EI.

Interestingly, in this comparison, multiracial children became even less likely to have parents who were aware of EI compared to white and Latinx children after isolating for the influence of African American children's likelihood of having parents who were aware of EI. Additionally, African American children's parents became significantly less likely to be aware of EI compared white and Latinx parents, controlling for the influence of multiracial children's likelihood of parental awareness in this new model.

In the regression model that included children identified as multiracial and African American separately and controlled for parental concern about children's development, the b-coefficients and significance levels for children's racial identities remained nearly the same as in the first model without any controls. This indicates that multiracial and African American children's parents in the sample were significantly less likely to be aware of EI compared to parents of white and Latinx children, regardless of parental concern about their child's development.

However, more information is needed to explore whether or not these differences are indeed racial disparities. Cook and colleagues (2012) describe that different models of analysis of racial disparities each have different assumptions about the interplay of racial identity and other counterfactual models that independently may explain differences by racial group in the rates of experiencing the phenomena being studied. For example, if I were able to use inclusion criteria limiting enrollment to parents with children who were diagnostically similar at birth and if I were to control for diagnostic similarity at age three, I could conclude that the differences in rates of parental awareness in EI may indeed be disparities due to having controlled more rigorously for health characteristics of children in the sample at both time timepoints.

In this study, children's health status at birth was a proxy for controlling for diagnostic differences at birth. Alternatively, with access to children's medical records, a future study could control for health status using actual birth weight and gestational age along with scores from validated diagnostic screening tools at multiple timepoints during the first three years of children's lives. With this additional information, researchers could more rigorously rule out differences in parental awareness due to differences in children's actual need for the services. However, what is notable is that although African American children in the study sample were significantly more likely to have experienced low birth weight or prematurity, African American parents did not significantly differ in awareness of EI compared to children of all other racial groups. An alternative theory would be that since African American children in the sample where significantly more likely to be born prematurely, with low birth weight, or with a diagnosis or condition that medical providers were concerned would impact their later development, I may have expected a higher rate of awareness of EI compared to parents of children of all other races who were less likely to be born with one of these three birth health status characteristics.

Similarly, and contrary to the study results, since children identified as white in sample had significantly lower rates of low birth weight and prematurity compared to children of all other races, I would not have been surprised if parents of white children in the sample were less likely to be aware of the EI program compared to parents of children of all other races. However, the results of the study are completely the opposite. All parents of children who were white were aware of the existence of the EI program regardless of their children's birth health status and regardless of the likelihood of having had a concern about their child's development. These findings indicate that there may be culturally-bound dynamics influencing parental

awareness of EI that act on the likelihood of parental awareness of EI separately from parental concern about children's development, children's health status at birth, and access to continuity of care at outpatient pediatric centers.

The findings of this study represent one of the only developmentally contextualized explorations of racial differences in parental awareness of EI specifically examining the first three years of children's lives, to date. The reduced likelihood of parental awareness of EI among African American and multiracial children compared to white and Latinx children provides evidence to justify future explorations of the broader association between factors impacting the likelihood of racial disparities in parental awareness of EI and potential racial disparities in underutilization of EI.

The results in this study also suggest that the experiences of African American children and multiracial children are not mutually exclusive. The unique, potentially culturally-bound experiences of parents of African-American children and multiracial children under three years old should be explored more deeply in a larger sample of children. Additionally, racial differences of the likelihood of parental awareness of EI in this study may point to the need to explore parental awareness of EI as a factor that may precede other researchers' observations of racial disparities in the timeliness of diagnosis of developmental delays and observed racial disparities in utilization of EI among African American children compared to white children (Magaña et al., 2012; Tang et al., 2012).

Housing insecurity on health care utilization patterns. In examining the relationship between different forms of housing insecurity and the likelihood of urgent care or emergency room visit use, I found that children who experienced a lack of affordability of housing compared to those who did not had significantly higher likelihoods of utilizing urgent care or

emergency rooms for visits during the first three years of life. However, the housing insecurity indicators represented by homelessness, frequency of moves, and having moved twice or more in a 12-month period were all not statistically significant predictors of urgent care or emergency room visit use. Although this pathway was not intended to influence the likelihood of parental awareness of EI, it does reflect patterns in the association of different forms of housing insecurity with other sources of medical care utilized. (Refer to Table 10 in Chapter Six for a presentation of the results pertaining to this discussion.)

Controlling for children's health at birth in a model examining the impact of the lack of housing affordability on the likelihood of UC or ER visits, children's health at birth was significant and positively related at the $p<0.10$ level. Compared to the model examining the lack of affordability in isolation on the likelihood of UC or ER visits (OR=3.95, $p< 0.10$), adding parental concern about their children's development as a control variable caused the impact of the lack of housing affordability on the likelihood of attending a UC or ER visit to shift to an odds ratio of 5.45 at a $p<0.05$ level of significance. Children's health at birth did not significantly predict urgent care or emergency room visit on its own.

Therefore, the collection of findings suggests that, compared to children with no birth health status risk who lived in economically stable housing, children experiencing simultaneous birth health risk and housing affordability issues in the first three years of life may have higher likelihoods of use of care services outside of pediatric medical homes. These findings mirror related findings from other studies that low-income children with special health care needs are more likely to attend visits at urgent care centers and emergency rooms than are children without special health care needs (Kuo et al., 2015). The study findings also mirror related findings that, among children utilizing Medicaid, children with more complex health care needs compared to

those without complex needs had higher rates of urgent care and emergency room visits and equally increased attendance at pediatric outpatient clinics (Montalbano et al., 2017)

The second set of hypotheses related to the exploration of housing insecurity on health care utilization addressed missed outpatient visits due to functional resource gaps in transportation in child care. The results indicate that housing insecurity was significantly, positively associated with missed medical visits due to gaps in access to transportation or child care for three of the four indicators of housing insecurity (See Table 10 in Chapter Six). Children who experienced homelessness were 7.25 times as likely as those who did not experience homelessness to miss medical visits due to gaps in these resources. Children who moved two or more times within a 12-month period were 4.16 times as likely as those who did not move two or more times in 12-months to miss visits due to gaps in resources. When controlling for parental concern about children's development which had a significant, opposite impact on missed visits (b= -1.60, OR=0.20), children moving twice or more within 12-months became 6.72 as likely to miss visits.

Additionally, although nine respondents (22.5%) of the total sample reported having missed or rescheduled visits due to gaps in access to transportation or childcare, only four respondents (18.2%) out of the total who reported having moved homes (N=22) stated that the gap in access to transportation was related to moving. Therefore, I conducted additional crosstabulations to determine the percent of subjects who missed visits due to resource gaps that also reported experiencing housing affordability issues. Interestingly, eight of the nine respondents (88.9%) reporting having missed or rescheduled visits due to resource gaps also reported experiencing housing affordability issues during the first three years of their child's life.

Taken as a whole, findings indicate that although continuity of care among the study sample was consistent, families who frequently move and families who experience homelessness may end up missing and rescheduling health care visits due to tandem gaps in transportation or child care that they experienced throughout the same time period. Furthermore, when controlling for children whose parents had a concern about their development, both increases in the frequency of moving and moving twice or more in 12-months became significantly more likely to result in missed or rescheduled visits due to lack resources. In these models, parental concern about children's development was significantly associated with decreased likelihoods of children having missed or rescheduled visits due to resource gaps.

However, these findings also point to the interrelatedness among different measurements of housing insecurity. Due to the small size of the sample, I was unable to test for the impacts of more than one kind of housing insecurity indicator on health care utilization patterns or on parental awareness of EI. Eight of the nine subjects reporting gaps in access to transportation or childcare that resulted in missed visits also experienced a lack of housing affordability suggest that housing insecurity and economic insecurity in tandem may have a stronger impact on patterns of attendance at outpatient visits than do indicators of housing insecurity that do not explicitly measure patterns of housing affordability. However, the study did not measure whether subjects missed or rescheduled outpatient visits for other reasons.

Implications for Social Work Professionals

Direct Service (Micro Practice). For social workers who serve families with young children who conduct biopsychosocial interviews in pediatric medical settings, the findings from this study indicate that a diversity of questions should be asked not only about current housing affordability conditions, but also about past mobility patterns and possible future expectations of

the need to double up with another family in an overcrowded situation. Answers to these questions may draw attention to subtle yet impactful levels of housing insecurity that families are enduring as they decide how to use limited resources daily.

Furthermore, families with children born with higher risk for delays in development due to low birth weight or premature birth who also experience different forms of housing insecurity may have higher acute health needs. Conversations about a diversity of housing tenure experiences as well as about past reasons for moving and future expectations surrounding the potential likelihood of future moves may also help to illuminate creative solutions that target housing, economic, and other forms of interrelated adversities among children born with health statuses putting them at risk of delays in their development. For families with young children, addressing children's developmental needs and family housing and economic needs in tandem can help to ensure that for children who do engage with Early Intervention services, they have a stable physical home environment in which to receive services.

A study of the effectiveness of using non-medical staff as peer navigators to engage with families with children who may be at higher risk for developmental delays found increased rates of utilization of EI among children in an urban pediatric office compared to rates prior to the involvement of a peer navigator (Guevara et al., 2016). Although parental awareness of EI was not compared between the groups of families with and without access to peer navigators, and, prevalence rates of housing insecurity or other social determinants of health were not a focus of the study, strategies such as the inclusion of a peer-support navigator in pediatric settings may help to mediate some of the differences in parental awareness in EI found among insecurely housed compared to securely housed families and among multiracial and African American children compared to white and Latinx children during the first three years of life.

Policy (Macro Practice). The findings of this study related to the application of the social determinants of health and health equity model suggest that targeted marketing and communications strategies are needed that consider unique pathways through which social adversities bidirectionally impact child developmental trajectories and parental awareness of and participation in supportive programs. Specifically, policies and marketing strategies should be targeted at timepoints and within processes throughout the first three years of children's lives when specific disparities in health outcomes, experiences of adversity, or access to information about supportive programs may occur. Additionally, the findings of this study suggest that during the first three years of life, housing and health priorities should not be mutually exclusive.

The Pathways Housing First movement acknowledges the importance of complementary and mutually supportive housing and health care policies to improve outcomes among adults with severe mental illnesses, addictions, and related issues who also routinely face homelessness (Padgett, Henwood, & Tsemberis, 2016). A parallel prioritization of young children's development and the stabilization of family housing during the earliest years of children's lives is also implicated by the study findings. Providing families with young children direct paths to affordable housing in desired locations where funding support is not linked to health care service compliance or psychoeducational program adherence would promote children's developmental wellbeing and could reduce the likelihood of missed medical visits that are associated with having to balance priorities using limited resources.

Additionally, findings suggest that among children of different racial identities experiencing a lack of housing affordability, social workers designing communication and marketing materials and strategies designed to inform families about developmental milestones or the EI program should consider that specific factors may need to be emphasized to address

multiracial parents' concerns or beliefs about engaging with developmental support programs such as the EI program. This implication is a primary contribution of my project to understanding the interactions of race, housing insecurity, and parental awareness of EI. The Center for Disease Control has a website with information and free, downloadable resources targeted for different service settings on the topic of child developmental milestones, learning the signs of developmental delays, and supporting the message that intervening as early as possible in children's lives is important, "Learn the Signs, Act Early" (CDC, 2018). Future awareness building campaigns could begin with a community-based, participatory review of the content of "Learn the Signs, Act Early" (CDC, 2018) materials in addressing culturally-bound attitudes and beliefs about children's development in the context of a diversity of tandem experiences of housing insecurity and other social adversities.

Future Research Recommendations

Regarding the exploration of racial differences in parental awareness of EI, these exploratory findings indicate that in a study with a larger sample size, multiracial children should be included in analyses independently and together with other racial groups in models exploring the whether there are shifts in magnitude or significance level in rates of parental awareness of EI among each group. Additionally, the findings throughout this study warrant a more comprehensive study of factors relating to parental awareness of Early Intervention among low-income and insecurely housed children during the first three years of life.

Future studies should be culturally-attuned to specific strengths, challenges, and attitudes and beliefs about child development and the use of support programs among children and families of different racial groups who may be navigating multiple adversities in more than one segment of their lives. A retroactive, mixed method, cross-sectional study design with access to

medical record data examining a broader range of social and economic adversities, medical visit histories, and parental opinion and belief about children's development and about Early Intervention would help to shed light on dynamics underpinning the disparities in EI utilization rates among low-income and minority children so that families experiencing social adversities may be better able to access developmental support for their children in culturally congruent ways.

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Appendix A: Screening Interview Script

Below is a copy of the Screening Interview Script. It is hosted in a Qualtrics website database.

SCREENING ELIGIBILITY QUESTIONS: "Thank you for taking time to hear more about this research study. I'm interested in talking with parents or guardians of children who are 3 years old. Our conversation would last anywhere between 30 - 60 minutes, depending on how many of the questions apply to you and your child's situation. I would be asking you information about your child's health at birth, his or her medical visits and your opinions about his or her development over the first three years of life, and about the kinds of living situations he or she has experienced since birth. I would also be asking questions about your household's finances and other basic demographic information about you. This helps us to be sure that we are asking people from many different backgrounds to answer the survey questions. Are you interested in possibly participating in this research study? If so, then I'll go ahead and ask you a few more questions now just to get your contact information. This will take about 5 minutes. After that, if you have time, we can continue with the full survey." OR "If you aren't interested, no problem. Thanks so much for being curious about the study. It has been great talking with you!"

Q1 Are you the parent or legal guardian of a child who is 3 years old? (The child must have turned 3 years old but cannot yet be 4 years old at the time of the interview.)
❍ Yes (1)

❍ No (2)

If No Is Selected, Then Skip To End of Survey

Q2 Are you between the ages of 18 and 75?
❍ Yes (1)

❍ No (2)

If No Is Selected, Then Skip To End of Survey

Q3 What is your First and Last Name?

Q4 What is your cell phone number?

Q5 Can we leave messages for you at this phone number?
❍ Yes (1)

❍ No (2)

Q6 Can we send you text messages at this number to follow up with you about the study? (We won't ask you any personal questions. These would be text messages just to set up a time to talk by phone or to check in with you to see if it's a good time to talk at that moment.)
❍ Yes (1)

❍ No (2)

Q7 What is a second phone number we could try if we are wanting to reach you?

Q8 Can we leave messages for you at this second number?
- Yes (1)
- No (2)

Q9 Okay, that's all the contact information that I'll need. Thanks! Would you like to keep talking on the phone with me now to continue to hear more details about the study and complete the survey if you are interested? It would be about another 30 - 45 minutes of your time.
- Yes, I'd like to keep talking now. (1)
- No, I'd like to get a call back at a later day and time to hear more and possibly complete the survey. (2)

Q10 If you would like to get a call back at a later date and time, what days and times are generally good for you?

Q11 [INTERVIEWER INSTRUCTION: Next, complete the following steps in this order:
1. If the participant wants to continue the interview now, write the participants first and last name down on a piece of scrap paper.
2. Open the "Informed Consent Database and Data Collection Survey." Complete the Informed Consent Process and Data Collection Survey.
3. After the phone call is completed, return to this record in the Screening Database.

Complete this question REGARDLESS OF WHETHER OR NOT THE ENTIRE SURVEY WAS COMPLETED.]The participant completed the Informed Consent Process and IS WILLING TO PARTICIPATE IN THE STUDY:
- yes (1)
- no (2)

Appendix B: Informed Consent and Data Collection Interview Scripts

Below is a copy of the Informed Consent Script and Data Collection Interview Script. It is hosted in a Qualtrics website database separately from the Screening database.

Q1.1 IF YOU ARE CALLING SOMEONE BACK, START HERE:

"Hello! My name is _____ (first name) and I'm calling for _____(insert participant's name here). Is she/he

available? I'm calling about completing a phone survey that she/he was interested in possibly completing."

IF SOMEONE ELSE ANSWERED FIRST AND THE SUBJECT COMES TO THE PHONE:

"Hi _____ (insert potential subject's 1st name), my name is _____ [Repeat your name if the person is just coming to the phone.] I am calling you back because you had expressed interest in possibly completing a phone survey about your 3-year-old child's housing and medical visit history, and questions about his or her development during the first three years of life. Is now still a good time to talk? It will take me about 10 - 15 minutes to tell you more about the study so you can decide if you want to do the survey. The survey itself will take about 30 - 45 minutes...(continue)"

IF YOU ARE CONTINUING DIRECTLY FROM THE SCREENING QUESTIONS, START HERE:

"...So, before you decide if you want to participate and answer the study questions, I want to tell you a little more about the study and give you a chance to ask any questions. I'm going to tell you more details about what the study is about and about things like how the study information will be stored. **After each section that I talk about, I'll stop to see if you have any questions about what I read before we go on.**

So, the title of the research project is "Access to preventative care and referrals" The primary researcher's name is Sarah M. Farash, LSW. I am _____, a researcher helping Sarah ask questions for the study.

Why are you being asked to participate? You are being given an opportunity to participate in this research project because you are a caregiver of a child who is between three and four years old. The total number of people being asked to participate in this survey project is approximately 100. Do you have any questions about this information?

What is the purpose of the study? The purpose of the study is to discover what factors impact the chance that a child attends well-child visits and receives referrals for extra services to support their development, if they are needed. After the study is over, the primary research investigator hopes to be able to make recommendations that might improve children's access to health care services. Do you have any questions about this section?

Do you have to participate in this study or is it optional? Your decision to participate is completely voluntary. You are not required to participate in this study. Do you have any questions about the voluntariness of the study?

What will you be asked information about if you participate in the study? If you choose to participate in the research study, you will be asked to answer questions about yourself, including questions about your income, level of education, and job status. You will also be asked questions about your child's housing locations since he or she was born. You will be also asked questions about your child's health at birth and child's medical visit attendance. You will also be

asked about conversations that you might have had with service providers about your child's development during the first three years of the child's life. Do you have any questions about the information you will be asked if you decide to participate?

Who will have access to my answers? While the study is occurring, only the research study team and the administrators who review the safety of the research project may have access to your answers. No staff at the medical office or other agencies will be able to access your responses to the surveys at any time during or after the study, unless you give permission in writing for this information to be shared. Your participation or decision not to participate will also have no impact on your relationship with the medical office or other agencies where you are currently receiving services.

After the study is complete and the results have been written up, the answers to the survey questions will be kept confidential. This means that no staff at the medical office, at educational centers, or at other agencies will be able to access your responses to the surveys at any time. Do you have any questions about this?

Where will my answers be kept and for how long? There are two separate electronic databases used to store information for this research project. One database is used to store the contact information such as your name and telephone number. This database will be kept for 2 years after the study is published. After that period, the data will be destroyed. The second database is used to collect and store the answers to the research questions that you would provide. No personally identifying information will be stored in this database. This survey answers database will be kept indefinitely for use in future publications, grant applications, and for educational purposes related to the topics covered by the survey.

Both the contact information survey database and the research survey answers database are stored using a secure (encrypted) connection to the host survey service provider. All electronic data are stored in a password protected account accessible by only the researchers and system administrators. While no absolute guarantees can be made regarding the security, these measures provide safeguards against outside agents accessing the electronic data. Do you have any questions about where or how long your answers will be kept?

What are the risks or possible benefits of participating in the study? The primary researcher will do everything possible to prevent or reduce discomfort and risk, but it is not possible to predict everything that might occur. For example, you may experience minor discomfort answering personal questions about yourself and your child's life. There are no direct benefits you will receive by participating in the study. However, some participants may feel a sense of satisfaction knowing that they are participating in a project whose aim is to make recommendations that might improve early childhood service delivery systems.

If you have any unexpected discomfort or need a referral for additional help or services as a result of participating in this research project, please call the following referral information source: Regional Early Childhood Direction Center at (585) 249-7817 or 1-800-462-4344. Any questions about this?

What will I get any money if I participate in this study? If you choose to participate in the research study, you will be entered into a random drawing to win a $50 Visa gift card to use anywhere that Visa is accepted. One person will be randomly chosen after all of the survey data is collected.

If you agree to participate, we will use the telephone numbers that you gave to us when you participated in the study to call you if you have been selected to receive the Visa gift card. At that time, we will ask you for your current mailing address so that we can send you the gift card. Your mailing address will not be stored and it will only be used for that purpose. Do you have any questions about the information I've just shared with you?

Who do I contact if I have questions about the study? If you have any questions about the research study, please contact the primary research investigator at the following phone number or email address: Sarah Farash, LMSW - 585-371-8085 (cell phone) / sarah.research.study@gmail.com (email).

You may also contact Sarah's supervisor, Dr. Tom Vartanian by email at tvartani@brynmawr.edu or by phone at 610-520-2624. If you have any concerns about your rights as a research participant, please be in touch with Dr. Leslie Alexander, Professor and Chair of the Bryn Mawr College IRB. She may be reached by email at lalexand@brynmawr.edu or by phone at 610-520-2635. Any questions about who you can contact if you have questions at a later time?

STATEMENT OF AGREEMENT TO PARTICIPATE:

[INTERVIEWER INSTRUCTION: Please read the following statements and fill in the applicable answer choices in the questions below after completing the informed consent process.]

Interviewer Read: Okay, now I am going to ask you a few yes or no questions. This section might seem repetitive. However, I need to ask these questions just to ensure that we have covered everything and that I have followed all of the steps that I am supposed to follow when I introduce the study to people who might be thinking about participating. Thanks so much for your patience and participation so far!

Q1.2 Are you 18 years old or older?

- ❍ Yes (1)
- ❍ No (2)

Q1.3 We have just completed the review of the information about the study called the informed consent process. Do you have any questions about anything that we talked about?

- ❍ Yes (1)
- ❍ No (2)

Q1.4 If you do have questions, did you have all of your questions answered to your satisfaction?

- ❍ Yes (1)
- ❍ No (2)

Q1.5 Do you agree to participate in this research study over the phone?

- ❍ Yes (1)
- ❍ No (2)

Q2.1 INTERVIEWER INSTRUCTIONS : Please read each question as it is written. Offer clarifying information written in square brackets [ ] at your discretion. Fill in the blanks with the respondent's answer. Please try to provide an answer for all questions, even if it represents the participant's "best guess".

INTERVIEWER READ: [The answers to the following questions will help us know that children from a variety of backgrounds are represented in the survey. We appreciate you sharing this information with us. Also, there are no right or wrong answers to any of the questions in this survey. We won't be judging you or evaluating your parenting style at all during this interview. We are simply interested in hearing your answers to the questions based on you and your child's past experiences. Any questions for me before we begin?]

How are you related your three-year old child? [Interviewer Instruction: If the participant has more than one child who is at least 3 years old but not 4 years old, please state the following: "If you have more than one child who is 3 years old, let's choose one of them to talk about for the rest of the questions. Feel free to choose whichever child you would like to talk about when thinking about the first three years of that child's life."]

- biological mother (1)
- biological father (2)
- step-mother (3)
- step-father (4)
- grandmother (5)
- grandfather (6)
- adoptive or foster mother (7)
- adoptive or foster father (8)
- other (please describe): (9) _____

Q2.2 Are you the child's legal guardian?[Clarification: This is the person who is allowed to sign permission forms on behalf of the child.]

- Yes (1)
- No (2)

Q2.3 How old are you now?

Q2.4 What is the child's racial background? (Select one or more.)

- American Indian or Alaska Native (1)
- Asian (2)
- Native Hawaiian or Other Pacific Islander (3)
- African American (4)
- White (5)
- Hispanic or Latino (6)
- Other (please describe): (7) _____

Q2.5 How many other siblings does your child have? When you answer this question, we'll count any full siblings, step or half siblings, adopted or foster siblings.

Q2.6 What is the highest amount of education you have completed?

- Less than 7th grade (1)
- Junior High (2)
- Some High School (3)
- High School Graduate (4)
- Some College (5)
- Special Training After High School (6)
- College Graduate (7)
- Graduate/Professional Training (8)

Q2.7 What is your current employment status?

- Not employed (1)
- Employed part-time (2)
- Employed full-time (3)

Q2.8 Are you a student?

- Yes (1)
- No (2)

Q2.9 What was the total household income where the child lived most of the time last year in 2016? Please give your best guess. Include the total wages and any other financial support received by all household members. [Clarification: If the child lives in more than one household, please ask about the primary household where the child lives. This is the household where the child lives more than half of the time.]

Q2.11 INTERVIEWER READ: [Next, I am going to read a list of different kinds of support that families sometimes use to help pay for things that they need. After I read the whole list, we will go back and you can tell me which ones your child's family receives.]

Is anyone who currently lives with your child receiving any of the following financial support? Please respond "Yes" or "No" to each kind of support as I read through a list of the types of support that people might receive.

- Temporary Assistance to Needy Families (TANF), also called a welfare check (1)
- Food Stamps or Supplemental Nutritional Assistance Program (SNAP) (2)
- Social Security Income/Disability Income (SSI/SSDI) (3)Medicaid or a State Child Health Insurance Program (S-CHIP) (4)
  - Housing Subsidy, such as Section 8 funds (5)
  - Child Support (6)
  - Other money or help paying bills from a friend or relative that doesn't live in the same house as the child (7)

Q3.1 INTERVIEWER READ: [I will now ask you questions about the health of your child at birth.] Sometimes children born at or less than 5.5 pounds are called "low birth weight babies". Did your child have "low-birth weight" when he or she was born?

- Yes (1)
- No (2)
- I do not know the answer to this question. (3)

Q3.2 Sometimes children born at 34 weeks or earlier are called "preemies" or "premature babies". Was your child born prematurely?

- Yes (1)
- No (2)
- I do not know the answer to this question. (3)

Q3.3 When your child was born, did your child have any known illnesses or conditions that doctors were concerned could negatively impact the child's growth or development? [Clarification - INTERVIEWER READ: For example, was your child diagnosed with a genetic disorder like Down's Syndrome, or with any problems with the function of the child's eyesight, hearing, heart, brain, or lungs?]

- Yes (1)
- No (2)
- I do not know the answer to this question. (3)

Q3.4 Is your child currently diagnosed with any behavioral or health conditions that require treatment?

- Yes (1)
- No (2)

Q3.5 If yes, what conditions or diagnoses does your child have?

_____

Q3.6 After your child was born, did you/(or, "the child's mother") receive any nursing or post-birth health care visits at home?

- Yes (1)
- No (2)

Q4.1 INTERVIEWER READ: [I will now ask questions about medical visits that your child may have attended since he or she was born.] Since your child was born, has he or she ever seen a primary care doctor or nurse for medical check-ups where he or she might have gotten things like shots or a physical exam?

- Yes (1)
- No (2)

Q4.2 Has anyone else taken your child to see a doctor or nurse at your child's primary care doctor's office since the child was born? [Clarification: This does not include going to the emergency room or going to a clinic or office that is specifically for urgent care only.]

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q4.3 If yes, what was the relationship to your child of the person who took your child to see a doctor or nurse? (Check all that apply.)

- ❑ biological mother (1)
- ❑ biological father (2)
- ❑ step-mother (3)
- ❑ step-father (4)
- ❑ grandmother (5)
- ❑ grandfather (6)
- ❑ adoptive or foster mother (7)
- ❑ adoptive or foster father (8)
- ❑ other (please describe): (9) _____

Q5.1 INTERVIEWER READ: [I would now like to think back with you to learn a little bit more about how often and where your child may have gone to see a doctor or nurse during the first three years of life. I realize it may be difficult to remember exactly how many times your child may have gone to the doctor. However, I'll ask you some questions that might help jog your memory. Let's start by thinking about the first three years overall when your child might have been sick or in need of follow-up care.

Q5.2 During the FIRST THREE YEARS of life, was your child ever seen by the child's primary care doctor or nurse because he or she was sick or needed follow-up care?

- Yes (1)
- No (2)

Q5.3 During your child's first THREE YEARS OF LIFE, did your child ever go to an urgent care clinic to be seen by a doctor?

- Yes
- No

Q5.4 During your child's first THREE YEARS OF LIFE, did your child ever go to the emergency room for medical treatment?

- YES
- NO

Q5.5 During the FIRST THREE YEARS OF LIFE, was your child ever seen by a specialist doctor or therapist because he or she needed specific follow-up care?

- Yes (1)
- No (2)

Q5.6 IF YES, what kind of specialists has your child seen during the first three years of life?

_____

Q5.7 INTERVIEWER READ: Now we are going to go back and just think about the well-child visits, or all the times when your child might have been seen for a shot or a physical exam. We are going to start with just the FIRST YEAR of your child's life. Generally, pediatricians like to see children at the following ages for appointments, even if the child is not sick.: 1 week, 1 month, 2 months, 4 months, 6 months, and 9 months. So in summary, a child might go at least 6 times to the doctor's office before they turn 1 year old even if they aren't sick]

Do you think your child missed any of these visits?

- Yes (1)
- No (2)

If NO is Selected, Then Skip To Was your child ever seen by a doctor ...

Q5.8 Out of the 6 total possible visits ,how many of these well-child visits do you think he or she missed?

Q6.1 INTERVIEWER READ: [Now let's go back and we'll think about the SECOND YEAR of your child's life. Generally, pediatricians like to see children at the following ages for appointments, even if the child is not sick. Often, children get shots or immunizations at these

visits: 12 months, 15 months, and 18 months old So in summary, a child might go at least 3 times to the doctor's office before they turn 2 years old even if they aren't sick]

Do you think your child missed any of these three visits?

- Yes (1)
- No (2)

If NO Is Selected, Then Skip To Was your child ever seen by a doctor ...

Q6.2 Out of three total possible visits between when your child was 1 years old and 2 years old, how many do you think your child missed?

Q7.1 INTERVIEWER READ: [Now let's go back and we'll think about the THIRD YEAR of your child's life. Generally, pediatricians like to see children at the following ages for appointments, even if the child is not sick. Often, children get shots or immunizations at these visits:

at 2 years old and 2.5 years old

So in summary, a child might go at least 2 times to the doctor's office before they turn 3 years old even if they aren't sick]

Do you think your child missed either of these visits?

- Yes (1)
- No (2)

If NO Is Selected, Then Skip To Was your child ever seen by a doctor ...

Q7.2 Do you think your child missed just one or both of these visits?

_____

Q8.1 So now I'm going to ask you to think about the entire first three years of your child's life.

Did your child go to the same primary care doctor's office for visits during the entire first three years of his or her life?

- Yes
- No

Q8.2 If no, How many different primary care offices did your child go to during the first three years of your child's life?

_____

Q9.1 INTERVIEWER READ: [Now I am going to ask you a few questions about your opinions about your child's development over the past three years.] At any point in your child's life, have you had concerns about your child's development in any area? I will read to you a list of categories that represent the main areas of development. As I read each one, let me know if at any point in your child's life, you have ever had concerns about your child's development.

INTERVIEWER INSTRUCTION:[Please read the following list to the participant. IF YES, put a check in the box next to the area.]

- ❑ Speech (imitating sounds, babbling, or forming words or phrases) (1)
- ❑ Physical growth or motor activity (weight concerns, difficulty learning to roll, sit up, crawl, stand, or walk, or concerns about beginning to gain independence doing daily routines like eating with a spoon, drinking from a cup, mixing a spoon in a bowl, pretending to drive, practicing or pretending to put on clothes or changing a diaper, etc.) (2)
- ❑ Hearing or vision (not turning his or her attention or pointing at things he or she hears or sees.) (3)
- ❑ Social or emotional (uncontrollable crying, throwing lots of temper tantrums, hitting or throwing things at people, hitting his or her head against a wall, biting him/herself or others frequently, or staring off into space for long periods of time) (4)
- ❑ Cognitive processing (such as difficulty with paying attention, not pointing or pulling on someone to get another person's attention, difficulty understanding or following 1 - 2 word instructions even when he or she is in a good mood "sit, give, stand-up", not showing that he or she can identify objects in books or pictures like "ball", "cup", "bottle", "baby", if you ask him or her to point or look at an object, etc.) (5)
- ❑ Other developmental area (please specify): (6)
- ❑ Participant is unable to remember specifics, but does recall having concerns about his or her child's development. (7)
- ❑ Participant has NEVER HAD ANY CONCERNS about his or her child's development. (8)

Q9.2 Have any doctors or nurses at any medical visits ever suggested that your child may be in need of extra support for his or her development in any of the following areas? In what areas?

- Speech (helping a child babble or start to form words) (1)
- Motor development or physical activity (helping a child to roll, sit up, crawl, stand, or walk, or beginning to gain independence doing daily routines like eating with a spoon,

drinking from a cup, mixing a spoon in a bowl, pretending to drive, practicing or pretending to put on clothes or changing a diaper, etc.) (2)

- Hearing or vision (helping a child to better hear or see things around him or her) (3)
- Social or emotional skills (uncontrollable crying, throwing lots of temper tantrums, hitting or throwing things at people, hitting his or her head against a wall, biting him/herself or others frequently, or staring off into space for long periods of time) (4)
- Cognitive processing (such as difficulty with paying attention, not pointing or pulling on someone to get another person's attention, difficulty understanding or following 1 - 2 word instructions even when he or she is in a good mood "sit, give, stand-up", not showing that he or she can identify objects in books or pictures like "ball", "cup", "bottle", "baby", if you ask him or her to point or look at an object, etc.) (5)
- Other developmental area (please specify): _____ (6)
- Participant is unable to remember specifics, but does recall that A DOCTOR OR NURSE suggested that the child might need extra support for development in some area. (7)
- The child's DOCTORS or NURSES NEVER SUGGESTED that the child might need extra support for his or her development. (8)

If The child's DOCTORS or NURS... Is Selected, Then Skip To Have any of the doctors or nurses eve...

Q9.3 Did the person who recommended that your child might need extra support know your child because the person saw your child before at a previous office visit?

- Yes (1)
- No (2)

Q9.4 Have you ever heard of the Early Intervention program?

- Yes
- No (If no, Interviewer read: [This is a program for children under 3 years old who might be eligible to receive visits at home or while at day care from people like speech therapists, occupational therapists (people who help children with eating, dressing, playing with toys), physical therapists (people who help children learn how to roll over, stand up, crawl, walk, etc.), or vision or hearing therapists"]

Q9.5 Have any of your child's primary care doctors or nurses ever given you information specifically about the Early Intervention program??

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q9.6 If you do remember receiving information about the Early Intervention program, do you remember if you ever called the Early Intervention program office to find out more about it?

- Yes (1)
- No (2)

Q9.7 After calling the Early Intervention program, do you remember if your child participated in Early Intervention? Or, in other words, do you remember if your child started to receive visits from people like those I mentioned before who help children with speech, physical movement, or doing daily things like eating or dressing?

- Yes (1)
- No (2)

Q10.1 INTERVIEWER READ: [Now we are going to switch topics and talk about questions related to your child's housing situations. We will talk about one more related topic after this and then we will be finished. Thank you so much for sharing your answers with me so far.]

Since the child was born 3 years ago, has the child lived in more than one location, even if it was only for a short time?

Clarification: [If your child has always lived in the same location but has also lived some days of the week in another location because of shared custody or because the child has visitation with another caregiver, we will not count that. Do you have any questions about what I'm asking about?]

- Yes (1)
- No (2)

Q10.2 Since your child was born, have you ever been worried about having enough money to pay the rent or mortgage?

- Yes
- No

Q10.3 Since your child was born, have you and your child ever doubled up living with another family or with friends?

- Yes
- No

If No Is Selected, Then Skip To End of Block

Q10.4 So, how many different places has your child lived in from birth through when your child turned 3 years old?

_____

Q10.5 Since your child was born, has your child ever lived somewhere for less than 12 months?

- Yes
- No

Q10.6 Since your child was born, has your child ever moved to a new place to live two times within any 1-year period? So for example, if your child lived somewhere for 6 months, and then moved somewhere else for 1 month and then moved again, that would be an example of having moved two times within 1 year.

- Yes
- No

Q10.7 Since your child was born, has your child ever moved to a new place to live more than two times within any 12-month period?

- Yes
- No

Q10.8 Since your child was born, have you ever been separated from your child temporarily where you both lived in different places for a period of time?

- Yes
- No

Q10.9 Since your child was born, have you and your child ever stayed at a shelter?

- Yes
- No

Q10.11 Since your child was born, were you and your child ever in a situation where you didn't have beds to sleep in at night?

- Yes
- No

Q10.12 On a scale of 1 - 5 where 1 is much worse and 5 is much better, how would you rate your child's living situation now compared to when he or she was born? I will read all of the answer choices out loud and then you can tell me which one seems to be the best fit.

- 1 - My child's living situation is MUCH BETTER now than at birth (1)
- 2 - My child's living situation is a LITTLE BETTER now than at birth (2)
- 3 - My child's living situation is ABOUT THE SAME now than at birth (3)
- 4 - My child's living situation is a LITTLE WORSE now than at birth (4)
- 5 - My child's living situation is MUCH WORSE now than at birth (5)

Q10.13 There are often many reasons why people move or choose to live somewhere new. I will read a list of reasons that people move or live in different places temporarily. Please say "Yes" if that was one of the reasons why your child may have moved or lived in a different place. If it wasn't one of the reasons, please say "No". I'll be putting check in a box next to the reasons that you say "Yes" to. If you need me to repeat any, I'd be happy to do that.

Did your child ever move because...?

□ You wanted to move closer to family or friends (1)
□ You wanted to move in with a partner, boyfriend, or spouse (2)
□ You wanted to move away from domestic abuse (3)
□ You wanted to move away from a household that had a lot of arguments or tension between household members (4)
□ You wanted to move away from a relationship breakup, a divorce, or a separation (5)
□ You wanted to move to a neighborhood that is closer to a job, public transportation, child care, a school, or college (6)
□ You wanted to move away from things that made the neighborhood unsafe (crime, drugs, bad neighbors, etc.) (7)
□ You wanted to move away from an apartment or house that had physical problems (bed bugs, water damage/mold, broken windows or walls, etc) (8)
□ You wanted to move to an apartment with more space due to the birth of a new child (9)
□ You wanted to move away from a crowded living situation where there was more than 2 adults in a bedroom (10)
□ You were being forced to move out due to the threat or due to an actual eviction or foreclosure (11)
□ You were being forced to move due to a fire (12)
□ He or she moved into foster care or was adopted (13)

- □ He or she moved back home after being in foster care (14)
- □ You were accepted into a Section 8 home, receiving money for housing support, or moving into a supported housing program. (15)
- □ You were not able to afford the rent or the mortgage (16)
- □ Are there any other reasons why your child moved that we haven't already talked about?(17) _____

Q11.1 INTERVIEWER READ: [This is the last section of questions. Thank you for your time so far. I am now going to ask if you ever experienced changes in access to reliable transportation, mail service, telephone service, or child care. I'm also going to ask questions related to these resources.] During the ENTIRE FIRST THREE YEARS of your child's life, has your child ever had to skip or miss a medical appointment because there wasn't anyone available to take care of other children in the household?

- Yes (1)
- No (2)
- Not Applicable (No other children were in the household during the child's first three years of life.) (3)

If No Is Selected, Then Skip To Since your child was born, has your c...If Not Applicable (No other ch... Is Selected, Then Skip To Since your child was born, has your c...

Q11.2 Did the loss in access to childcare that happened at the time of the missed medical visit occur because of the change in living situation? [Clarification: Such as moving to a place where no one else was available to watch the children, or, moving to a place and not being able to find a close enough or new child care arrangement?]

- Yes (1)
- No (2)
- Not Applicable (3)

Q11.3 During the ENTIRE FIRST THREE YEARS of your child's life, has your child ever had to miss or skip a medical appointment because transportation to the visit was not available?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To Since your child was born, you ever h...

Q11.4 Did the lack of reliable transportation and missed medical visit happen because of the change in your child's living situation? (Clarification: Such as, losing access to a bus stop, or losing access to a car or a ride from someone in the house because of the move?)

- Yes (1)
- No (2)

- Not Applicable (3)

Q11.5 During the ENTIRE FIRST THREE YEARS of your child's life, have you ever had trouble receiving communication by mail that was from your child's doctor's office or from programs or services that your child might be involved in?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To Since your child was born, has the pr...

Q11.6 Did the difficulty receiving mail for your child happen because of the change in the child’s living situation?

- Yes (1)
- No (2)
- Not Applicable (3)

Q11.7 During the ENTIRE FIRST THREE YEARS of your child's life, has the primary contact phone number that you give to your child's medical office's or service programs ever been disconnected or changed?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q11.8 Were any of the disconnections or changes in phone numbers because of a change in your and your child's living situation? Clarification: [For example, if you moved and ever lost access to a cell phone because it was owned by someone else in the house or lost access to a hard-wired phone, answer yes to this question.]

- Yes (1)
- No (2)
- Not Applicable (3)
-

Q12.1 Thank you so much for taking the time to answer these questions today. If you have any questions or want to talk to someone about your experience taking this survey, you can contact the primary researcher, Sarah Farash Alexander at sarah.research.study@gmail.com or by phone at 585-310-2363.

Appendix C: Recruitment Materials