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Maternal, Infant, and Early Childhood Home Visiting and School Readiness in Alabama

Heather H. Johnson
University Of Alabama At Birmingham

MATERNAL, INFANT, AND EARLY CHILDHOOD HOME VISITING AND SCHOOL READINESS IN ALABAMA

by

HEATHER H. JOHNSON

JULIE PRESKITT, COMMITTEE CHAIR
DAVID BECKER
MATTHEW FIFOLT
CANDACE KNIGHT
MARTHA S. WINGATE

A DISSERTATION

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HEATHER H. JOHNSON

HEALTH POLICY AND ORGANIZATION

ABSTRACT

This study examined the relationship between home visiting and school readiness in Alabama. Topics included a scoping review of the home visiting literature, statistical analyses of Alabama's Teaching Strategies *GOLD®* *(GOLD)* data to determine if there were differences in performance among children who received home visiting compared to those who did not, and the development of a Key Driver Diagram (KDD) to inform improvement in home visiting practices that support school readiness. The scoping review of the literature indicated an absence of consistent definitions and measurement of the concept of school readiness. Through thematic analysis of the articles, contextual factors that impede or promote school readiness in the home environment were identified and defined. The statistical analysis of GOLD data, measured at pre-kindergarten entry into Alabama's First Class Pre-K program, resulted in a finding of null results of Alabama's home visiting program on school readiness with one exception: children who received home visiting services were less likely to score favorably on the cognitive domain. Development of the KDD addressed the findings of the scoping review by fleshing out the definition of school readiness and the theory by which home visiting can address contextual factors that impede school readiness in the home environment. The KDD addressed the null findings of the statistical analysis by focusing on improvements in practice that may lead to improved school readiness. Future research should include qualitative and quantitative data collection and analyses to develop a conceptual model of

school readiness; additional multivariable analyses that better account for nuances in home visiting participation intensity, timing, and duration and context; and the development of a full change package for use in Continuous Quality Improvement (CQI) efforts.

Keywords: School readiness, home visiting, Alabama, MIECHV, Continuous Quality Improvement, Early childhood education

DEDICATION

This dissertation is dedicated to my husband and children, Tyler, Aiden, Noah, and Lily. I love you!

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LIST OF ABBREVIATIONS

ABC	Attachment and Biobehavioral Catch-UP
ACF	Administration for Children and Families
ADECE	Alabama Department of Early Childhood Education
AlaKids	Alabama Kindergarten Inventory for Developing Skills
ALSDE	Alabama State Department of Education
CQI	Continuous Quality Improvement
ETO	Efforts to Outcomes
FCPK	First Class Pre-K
FTHV	First Teacher Home Visiting
GOLD	Teaching Strategies GOLD
HHS	Health and Human Services
HIPPY	Home Instruction for Parents of Preschool Youngsters
HomeVEE	Home Visiting Evidence of Effectiveness
HRSA	Health Resources and Services Administration
KDD	Key Driver Diagram
LCT	Life Course Theory
LIA	Local Implementing Agency
MIECHV	Maternal, Infant, and Early Childhood Home Visiting

MIHOPE	Mother and Infant Home Visiting Program Evaluation
MIHOPE-LT	Mother and Infant Home Visiting Program Evaluation Long-Term
NFP	Nurse Family Partnership
OPRE	Office of Planning, Research, and Evaluation
PAT	Parents as Teachers
PC Talk	Promoting Communication Tools for Advancing Language in Kids
PCHP	Parent Child Home Program
Pre-K	Pre-kindergarten
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
RCT	Randomized Controlled Trial
REDI-P	Research-Based, Developmentally Informed Parenting
SES	Socioeconomic Status
TANF	Temporary Assistance for Needy Families
VIPP-SD	Video-Feedback Intervention to Promote Positive Parenting-Sensitive Discipline
WHE	Widely Held Expectations

INTRODUCTION

The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) is a federal program administered by the Health Resources and Services Administration (HRSA) in partnership with the Administration for Children and Families (ACF), within the United States Department of Health and Human Services (HHS). The purpose of MIECHV is to provide voluntary, evidence-based home visiting services to support "pregnant people and parents with young children who live in communities that face greater risks and barriers to achieving positive maternal and child health outcomes" (Health Resources and Services Administration, 2023, para. 1). MIECHV was authorized under the Patient Protection and Affordable Care Act in 2010. On December 29, 2022, President Biden signed the Consolidated Appropriations Act of 2023 which included the Jackie Walorski Maternal and Child Home Visiting Reauthorization Act of 2022. This law reauthorized MIECHV through fiscal year 2027 and increased the total budget allocation from $400 million to $500 million per year (United States Congress, 2023).

MIECHV funding is granted to states, territories, and tribes through a competitive application process. Funds must be used to provide services to families and may serve children prenatally through kindergarten entry (Health Resources and Services Administration, 2023). States are given the flexibility to choose between 19 evidence-based service delivery models approved by HHS for evidence of effectiveness through the Home Visiting Evidence of Effectiveness (HomVEE) review, and many states

provide home visiting through a combination of models to address the needs of diverse populations (Home Visiting Evidence of Effectiveness, n.d.).

MIECHV has the following goals: improve maternal and child health, prevent child abuse and neglect, encourage positive parenting, and promote child development and school readiness (Health Resources and Services Administration, 2023). The most comprehensive study of home visiting, known as The Mother and Infant Home Visiting Program Evaluation (MIHOPE), was mandated by MIECHV legislation in 2010 (MDRC, 2020). This study was conducted by the Manpower Demonstration Research Corporation (MDRC), in partnership with James Bell Associates, Johns Hopkins University, Mathematica Policy Institute, and the University of Georgia. It included four sub-parts: a random assignment impact study, an implementation study, a cost analysis, and an analysis of 2010/2011 needs assessments that were conducted by states and territories. This study comprised approximately 4,200 mothers enrolled in 88 home visiting programs between 2012 and 2015, across 12 states. Mothers participated in one of four home visiting models, Early Head Start-Home-based option, Healthy Families America, Nurse-Family Partnership, and Parents as Teachers (Association of State and Tribal Home Visiting Initiatives, 2019; MDRC, 2020; Michalopoulous, C., et al., 2019; Michalopoulous, C., et al., 2019).

The MIHOPE impact study found an association between home visiting and improved home environments, reductions in psychological aggression from parent to child, fewer emergency department visits, fewer child behavior issues, reduced maternal depression, reduced intimate partner violence, and less parent stress. Because the children in the study were infants, ranging from six months of age to 15 months of age, there were

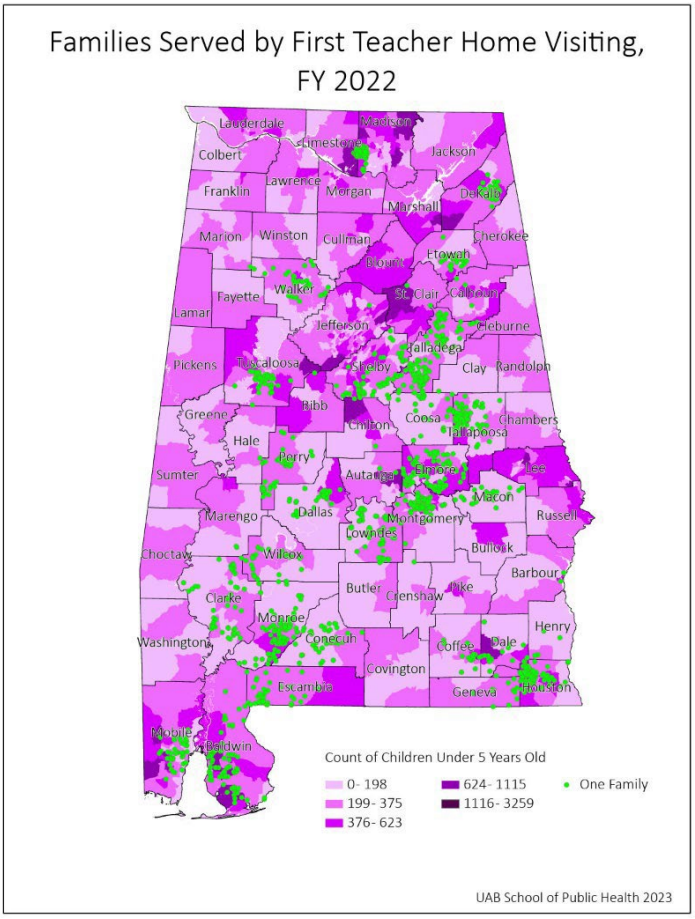
no findings reported for school readiness or academic achievement (Association of State and Tribal Home Visiting Initiatives, 2019; Michalopoulous, C., et al., 2019; Michalopoulous, C., et al., 2019). In 2016, the MIHOPE Long-Term Follow-Up project (MIHOPE-LT) began. MIHOPE-LT will ultimately study the effects of MIECHV-funded home visiting on children and families as children progress through primary school (Michalopoulous, 2017).

MIECHV in Alabama

The Alabama Department of Early Childhood Education (ADECE) is Alabama's designated lead agency for MIECHV-funded home visiting. The *First Teacher* home visiting program began home visiting service delivery in 2011 to 13 of the state's most at-risk counties (Wingate et al., 2014). In 2013, services were expanded to an additional 30 counties. As of 2022, home visiting was provided in all 67 counties. MIECHV funds are used to provide services in 43 counties (Alabama Department of Early Childhood Education, 2020). In 2022, First Teacher provided over 66,000 visits to approximately 3,949 families and 4,194 children (National Home Visiting Resource Center, 2023).

Figure 1

Families Served by Alabama's First Teacher Programs, FY2022



Source. Enlow et al., 2022.

First Teacher uses three home visiting service delivery models— Nurse Family Partnership (NFP), Parents as Teachers (PAT), and Home Instruction for Parents of Preschool Youngsters (HIPPY) (Alabama Department of Early Childhood Education, 2020). All three models are considered effective, evidence-based interventions by HomVEE, but each is unique in its implementation and focus (Home Visiting Evidence of Effectiveness, n.d.). NFP serves first time mothers who enroll in services prior to 28 weeks gestation. Families may receive services until the child's second birthday. NFP is a

medical model, using nurses as home visitors, with an emphasis on improving birth outcomes, and maternal and child health during pregnancy and in infancy (Nurse Family Partnership, 2023). PAT serves women prenatally through the child's entry into kindergarten. PAT uses paraprofessionals in the role of home visitors and emphasizes maternal and child health, improved parenting skills and parent child interaction, and school readiness (Parents as Teachers, 2022). HIPPY serves children, ages two through five, using a 30-week curriculum with a strong focus on school readiness. The HIPPY model aims to train parents who once participated in the program to provide services (HIPPY USA, n.d.). Despite the individual foci of the models, participation in MIECHV requires demonstration of improvement in a common set of outcome measures including measures of maternal and child health, school readiness, and family economic self-sufficiency (Health Resources and Services Administration, 2023).

Family Risk Characteristics and Outcomes

Most families enrolled in First Teacher are a part of at least one MIECHV designated priority population. Over half of First Teacher families are considered low income, meaning they are at or below 100% of the Federal Poverty Level (Alabama Department of Early Childhood Education, 2022).

Table 1

Percentage of Participating Families with Self-Identified MIECHV Priority Population Characteristics, 2022 (Alabama Department of Early Childhood Education, 2022)

Priority Population Characteristics	% of Enrolled Families
Low income household (at or below 100% FPL)	56.4%
Household contains an enrollee who is pregnant and under the age of 21	7.4%
Household has a history of child abuse and neglect or has had interactions with child welfare services	7.6%
Household has a history of substance abuse or needs substance abuse treatment	2.8%
Someone in the household uses tobacco products in the home	7.1%
Someone in the household has attained low student achievement or has a child with low student achievement	3.4%
Household has a child with developmental delays or disabilities	11.3%
Household includes individuals who are serving or formerly served in the U.S. armed forces	3.0%

Priority population characteristics are associated with an increased risk of poor outcomes, including poor academic achievement (National Scientific Council on the Developing Child, 2014, 2015 Pascoe et al., 2016, Shonkoff & Garner, 2011). Home visiting attempts to mitigate risk and improve these outcomes; however, in Alabama, there have not been any studies to date regarding the association between the receipt of home visiting services and school readiness.

In addition, home visiting is costly to implement, and attrition is high (Duggan et al., 2018). Many families receive less than the recommended *dose* of home visiting, and very few studies have examined the association between dose and outcomes. Finally, while there are guidelines for which characteristics should be prioritized in home visiting, there is little evidence regarding if or how families with various combinations of risks benefit differentially (Anderson et al., 2003). Additional evidence is needed to determine which families benefit the most from home visiting, and the intensity and duration needed to bring about improvement in outcomes (Association of State and Tribal Home Visiting Initiatives, 2019; Michalopoulous, C., et al., 2019; Michalopoulous, C., et al., 2019).

School Readiness

Early childhood programs may make an impact on various domains of a child's school readiness, such as cognitive skills, social skills, and overall health. Programs may also intervene at the level of the caregiver, improving the child's home environment, and helping the caregivers improve their overall health and well-being so that they may better support their child.

Home visiting aims to intervene at both the child and caregiver levels. There is a dual emphasis on helping caregivers teach their children the developmentally appropriate skills needed for school entry, while connecting caregivers with the resources needed to improve their own educational, health, and social opportunities (Health Resources and Services Administration, 2023). These interventions are important because of their theorized impact on school readiness and outcomes later in life, such as higher educational attainment, decreased delinquency, and better overall health and wellness

(Bonifacio, 2019; Heckman, 2007: Knudsen, 2006; Pianta, 2002; Ricciadi et al., 2021; Williams; 2019; Zuckerman & Halfon, 2003).

Purpose

Overall, the purpose of this research was to use both qualitative and quantitative research methods to understand and enhance the literature regarding the relationship between home visiting programs and school readiness. The three aims are:

Aim 1: Examine the existing literature about home visiting and school readiness. We conducted a scoping review of the literature, searching CINAHL, PubMed, Scopus, and Embase. To our knowledge, this was the first scoping review of this topic. The results of this review will help policy makers and researchers understand the details and gaps of existing literature on the definition of school readiness, home visiting's effect on school readiness, and the contextual factors that impede or contribute to school readiness.

Aim 2: Explore the association between home visiting and school readiness, based on performance on Teaching Strategies GOLD® (GOLD) at pre-kindergarten entry. We examined two years of GOLD scores to study the differences among children who participated in Alabama's First Teacher Home Visiting Program compared to children who did not participate. This allowed us to determine whether home visiting was associated with school readiness scores in six domains of development (social-emotional, physical, language, cognitive, literacy, and math). This is significant because it was the first study to look at the association between home visiting and standardized school readiness assessments in Alabama.

Aim 3: Gather expert feedback about best practices for improving school readiness to inform Continuous Quality Improvement (CQI) efforts in home visiting. This work is significant because it informs home visitors' practice by linking specific home visiting efforts to an overall theory of improvement. The KDD is a useful tool that may be employed immediately in the field and improved upon in real-time, based on real-world experience and feedback from home visitors and families.

Guiding Theories

There are multiple theoretical frameworks that guided this work. The first is Bronfenbrenner's ecological systems theory. This theory explains that bidirectional interactions between children and their environment, including individual, family, community, and societal exposures, influence child development (Bronfenbrenner, 1979). The second theory of importance is the Life Course Theory (LCT). LCT describes the ways in which early childhood experiences affect the trajectory of one's life (Elder, 1998). These theories underpin the importance of intervening early in a child's life to positively influence outcomes. Finally, this work was grounded in the risk and resilience framework. This framework describes the importance of protective factors and promotive factors. Protective factors reduce the effect of risk factors and promotive factors influence positive development independent of risk. Protective and promotive factors include both internal and external resources, and operate across individual, family, and environmental contexts (Fraser et al., 2004).

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PAPER 1: DEFINING SCHOOL READINESS AND EARLY CHILDHOOD CONTEXTUAL FACTORS THAT MODERATE HOME VISITING'S EFFECT: A SCOPING REVIEW

HEATHER H. JOHNSON, ELIZABETH TAYLOR, MATTHEW FIFOLT, MARTHA S. WINGATE, CANDACE KNIGHT, DAVID BECKER, JULIE PRESKITT

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INTRODUCTION

School readiness is a complex and multi-faceted concept. Readiness at school entry has been associated with outcomes, such as performance on standardized academic testing in primary and secondary school; school suspensions; retention and delinquency; and longer-term outcomes, such as employment status, income level, and overall health and well-being (Bonifacio, 2019; Heckman, 2007: Knudsen, 2006; Pianta, 2002; Ricciadi et al., 2021; Williams, 2019; Zuckerman & Halfon, 2003). These associations with health and well-being throughout the life course has made school readiness a topic of interest among researchers, practitioners, and policy makers.

Many early childhood interventions, including pre-kindergarten (pre-K) and home visiting programs, aim to improve school readiness (Williams, 2019). Home visiting is of particular interest, as school readiness is a primary focus. Home visiting is considered a two-generation approach; there is a focus on both children and caregivers. The goals of home visiting include helping caregivers achieve their personal goals while creating a safe environment that is conducive to their child's learning. In addition, home visitors share information about child development, empowering parents to develop secure attachments and foster positive relationships with their children (Health Resources and Services Administration, 2022).

In general, families who participate in home visiting may have additional complications that require their time and attention, reducing their ability to support the development of their children (Health Resources and Services Administration, 2022).

Poverty, family violence, substance misuse, and maternal depression are factors that may moderate the effect of home visiting services on maternal and child health and well-being outcomes, including school readiness (Cluxton-Keller et al., 2013; Harvard University Center for the Developing Child, 2015; Noble et al., 2015; Pascoe et al., 2016; Shonkoff, 2012). Home visiting programs attempt to address the needs of these high-priority families by offering services and supports that they might not otherwise access. However, there is a need within the field to understand how supports may be tailored to meet family needs. To determine which interventions are effective for different families, home visiting must understand more about the social and cultural contexts in which families live, work, and play. Specifically, the field must know more about which contextual factors moderate the effect between specific components of the home visiting intervention and the desired outcome (Home Visiting Applied Research Collaborative, n.d.). This may be especially difficult when there is not a common understanding among researchers and practitioners regarding the definition and measurement of the target outcome.

To our knowledge, there are no reviews within the peer-reviewed literature that examine similarities and differences in common definitions of school readiness or the effect of home visiting on academic outcomes. Further, there is a gap in the literature about contextual factors that may impede or promote school readiness in the home environment. While some studies examine individual domains of school readiness, there is a need to combine and organize factors to present a comprehensive understanding of context that may moderate early childhood intervention effects.

Objectives

A scoping review was conducted to map existing research and identify gaps in knowledge. This type of review was considered appropriate because of the breadth of the topic of school readiness and the desire to identify themes in the literature regarding factors that impede or promote school readiness. Scoping reviews are especially useful when the purpose includes identifying knowledge gaps, clarifying key concepts or factors related to a concept, or identifying the types of available evidence or examining how research is conducted in a field or topic (Arksey & O'Malley, 2005; Levac et al., 2010; Munn et al., 2018). The authors followed the Preferred Reporting Items for Scoping Reviews guidelines (Tricco et al., 2018).

Methods

To identify relevant peer-reviewed journal articles, the following databases were searched: CINAHL, PubMed, Scopus, and Embase. Search terms were reviewed by the academic librarian at the University of Alabama at Birmingham, Lister Hill Library and the search was conducted between March 2022 and May 2022. To meet inclusion criteria, articles had to be peer-reviewed, published between 2016 and 2022, based in the United States, and written in English.

Search results were imported into Covidence, and duplicates removed (Covidence Systematic Review Software, Veritas Health Innovation, Melbourne Australia). Two reviewers screened all titles, abstracts, and full text of the publications identified in our search. During the abstract review, articles were excluded if they did not address at least one of the following questions: (1) How is school readiness defined? (2) Is home visiting

associated with improvements in school readiness? (3) What family, interpersonal, community, or societal contextual factors may impede school readiness? (4) What family, interpersonal, community, or societal contextual factors may promote school readiness? In addition, articles were excluded if they focused on elementary, middle, or high school academic achievement, rather than readiness at school entry; if they were focused on interventions occurring in a medical setting, such as a pediatric medical home, or within a school setting, rather than in-home interventions; and if they focused on individual child-level health factors that influence school readiness. Disagreements on study inclusion were resolved by consensus.

A summary chart was created, and data were extracted by the lead author using Excel. We abstracted data on the article focus (e.g., Did the article include a definition of school readiness? Which school readiness domains were included? Was the study about the association of home visiting and school readiness?). In addition, characteristics of the study were recorded, including the type of research design, sample size, and results. Finally, information was extracted on factors that may impede or promote school readiness. Two authors met to review the summary chart and determine a coding framework that would be used to code and organize information from the summary chart. Relevant data were coded using NVivo 20 under the domain of school readiness, factors that lead to school readiness, and factors that impede school readiness in the coding framework. The lead author reviewed the established coding framework and collapsed interrelated codes into themes. Data organized under the coding framework were used to determine frequency of each factor and guide the discussion of findings.

Results

The search retrieved 9,774 articles. After duplicates were removed, 9,714 studies remained. Upon abstract review, 9,646 studies were deemed irrelevant because either they were not related to home visiting, or they did not address at least one of the inclusion criteria questions. The first author conducted a full text review of 68 articles. After excluding articles that did not meet the eligibility criteria, 33 studies were identified. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) diagram is provided in Figure 1.

Figure 1

PRISMA Diagram of Identified and Excluded Articles

Source: Tricco et al., 2018.

School Readiness Definition

Of the 33 articles reviewed, four articles included a definition of school readiness. Conway (2018) described school readiness as a multi-faceted concept that includes cognitive development, social and behavioral skills, and health. Executive skills, described as a sub-category of cognitive function, are defined as skills that require active, intentional effort on the part of the child. These include skills related to attention and impulse control. They fall into three categories: inhibition, working memory, and

cognitive flexibility. Inhibition is the ability to control one's attention, thoughts, emotions, and behaviors. Working memory is the ability to hold knowledge in one's mind and make decisions based upon it. Cognitive flexibility is the ability to adapt one's thinking and generate alternative responses to challenges. Ghandour et al. (2020) described school readiness as an umbrella term that encompasses physical well-being and motor development, social and emotional development, approaches toward learning, language development, and cognition and general knowledge. Pratt et al. (2016) described school readiness as the behaviors and skills that allow children to engage and learn at school. Finally, Shaw et al. (2021) explained that school readiness is comprised of preacademic skills, such as cognition, language, early literacy, and numeracy; self-regulation skills, such as sustained attention, executive functions, and emotional regulation; and social-emotional skills, such as prosocial and problem behavior.

Outcome of Interest

The outcome of interest varied among articles. Three articles focused on an outcome of school readiness, while others focused on one or more domains of development or skills that contribute to readiness. Nine articles focused on language and literacy development, seven on social emotional development, six on cognitive development, three on physical health, one on early learning skills, and one on pre-academic skills. In addition, six articles focused on math and reading achievement on standardized tests. Even within domains, there were differences in interpretation between authors. For example, within the social emotional domain, authors describe a broad set of behaviors and skills, including social competence and emotional maturity (LaForett et al.,

2017); self-regulation (Pratt et al., 2016); and interpersonal skills and externalizing and internalizing behaviors (Smith Adcock et al., 2019).

Table 1

School Readiness Domains of Interest

Outcome	Reference
School Readiness	Adulaziz, 2022 Ghandour et al., 2020 Lahti et al., 2019 Bigelow et al., 2018 Coba-Rodriguez & Jarett, 2022 Daniz Can et al., 2021 Fantuzzo et al., 2019
Language and Literacy Development & Skills	LaForett & Mendez, 2017 List et al., 2021 Loughlin-Presnell & Bierman, 2017 Manz et al., 2016 Nix et al., 2018
Social Emotional Development & Skills	Frosch et al., 2021 Ghandour et al., 2020 LaForett & Mendez, 2017 Nix et al., 2018 Pratt et al., 2016 Smith Adcock et al., 2016 Wolf et al., 2017
Cognitive Development & Skills	Baudry et al., 2016 Conway et al., 2018 Grindal et al., 2016 Lahti et al., 2019 List et al., 2021 Murphy et al., 2022
Physical Development & Skills	Frosch et al., 2021 Ghandour et al., 2020 Halfon et al., 2020
Early Learning Skills Pre-Academic Skills	Ghandour et al., 2020 Grindal et al., 2016 Paschall et al., 2017
Math and Reading Achievement	Pratt et al., 2016 Roby et al., 2021

Smith Adcock et al., 2019
Vinopal & Morrissey, 2020
Wolf et al., 2017

Home Visiting and School Readiness

Ten articles focused on home visiting as an intervention of interest. Home visiting models included in the studies were Home Instruction for Parents of Preschool Youngsters (HIPPY), Promoting Communication Tools for Advancing Language in Kids (PC Talk), Attachment Biobehavioral Catch-UP (ABC), Video-Feedback Intervention to Promote Positive Parenting-Sensitive Discipline (VIPP-SD), Parents as Teachers (PAT), Research-Based, Developmentally Informed Parenting (REDI-P), Parent Child Home Program (PCHP), and Smart Beginnings. Seven studies were quasi-experimental or experimental, randomized controlled trial (RCT) designs, and one study was a meta-analysis. Of those, six found positive results related to school readiness outcome measures.

Table 2

Studies with Focus on Home Visiting

Reference	Home Visiting Model	Design	Results
Abudulaziz et al., 2021	HIPPY	Quasi-experimental	Home visiting participation associated with higher scores on school readiness measure
Bigelow 2018	PC TALK	RCT	Children who received a text message enhancement to the PC TALK intervention did not score better on language outcome
Frosch et al., 2021	ABC, VIPP-SD	Descriptive	N/A

Grindal et al., 2016	N/A-Parent education programs	Meta-analysis	No statistically significant association between parenting education programs and cognitive or pre-academic skills
Lahti et al., 2019	PAT	Quasi-experimental	Home visiting participation associated with statistically significantly higher scores in reading and math achievement
List et al., 2021	Unspecified	RCT	Compared to children whose parents participated in a video intervention, children in home visiting had increase in vocabulary, math, and social emotional skills
Loughlin-Presnell, 2017	REDI-P	RCT	Home visiting participation associated with an increase in parents' academic expectations, parent-child interactive reading, and parent child conversations
Manz et al., 2016	PCHP	Quasi-experimental	Home visiting participation associated with statistically significant increase in expressive language
Nix et al., 2018	REDI-P	RCT	Association between parent use of program materials and growth of child literacy and social skills. Association between the working alliance between home visitor and parent and growth of child language arts and attention skills, and social adjustment
Shaw et al., 2021	Smart Beginnings	Descriptive	N/A

Factors that Impede School Readiness

Contextual factors that impede school readiness were captured in four themes: low socioeconomic status, teenage or single parenthood, caregiver depression, and racism. The themes are further described below.

Low Socioeconomic Status

Socioeconomic status (SES) is defined as the social standing of an individual, and includes measures of education, income, and occupation (American Psychological Association, 2022). Three articles focused on low SES as an important risk factor (Abudalaziz et al., 2021; List et al., 2021; Magnuson et al., 2019), while six articles discussed poverty as an important risk factor (Murphy et al., 2022; Nix et al., 2018; Paschall et al., 2017; Rouse et al., 2020; Shaw et al., 2021; Smith Adcock et al., 2019). Smith Adcock et al. (2019) suggested that poverty is acting upon school readiness through its relationship with parental function and family processes. Shaw et al. (2021) also described poverty's effect on positive parent child interactions and relational health as the mechanism by which it creates disparities in school readiness. Nix et al. (2018) explained in more detail that stressful economic situations are associated with family instability and higher elevated rates of mental health and social isolation. These conditions undermine positive parenting practices and parental support of learning.

Murphy et al. (2022) described poverty's effect on the child. The stress of poverty in early childhood is adversely related to neural capacity development which may affect the resilience of the child and their ability to benefit from positive early childhood experiences. Magnuson et al. (2019) expanded upon that idea by linking low SES to

parent stress and conflict and punitive and detached parenting practices, less predictability and higher levels of noise and activity in the home environment, which leads to an elevated child stress response. Finally, List et al. (2021) describes a direct relationship between SES and parent beliefs in the importance of parental investments in child development.

Two articles stressed the importance of measuring poverty at a neighborhood level, rather than at the individual family level (Vinopal et al., 2020; Wolf et al., 2017). Neighborhood poverty is an important contextual factor as it considers additional dimensions of economic disadvantage that create burdens on families that extend beyond their individual economic circumstances (Vinopal et al., 2020; Wolf et al., 2017). This contextual factor includes the inaccessibility of community resources, such as grocery stores, transportation, etc. (Wolf et al., 2017).

Low maternal education was discussed in four articles (Abudulaziz et al., 2021, Coba-Rodriguez et al., 2020; Fantuzzo et al., 2019; Rouse et al., 2020). Fantuzzo et al. 2019) showed a link between low maternal education and reading achievement. Unemployment (Abudalaziz et al., 2021) and inadequate housing (Fantuzzo et al., 2019) also surfaced as important contextual factors.

Teenage or Single Parenthood

Several articles mentioned teenage parenthood *(*Baudry et al., 2016; Fantuzzo et al., 2019; Rouse et al., 2020) and single parenthood (Rouse et al., 2020) as important contextual factors. Baudry et al. (2020) conducted a meta-analysis of interventions aimed at improving the cognitive outcomes of children of teenage parents and found a low to

modest effect (d=36). Fantuzzo et al. (2019) found no statistically significant association between teenage parenthood and first grade reading achievement scores. Conversely, Rouse et al. (2020) found statistically significant associations between both teenage parenthood and single parenthood and lower scores on tests of reading and mathematics achievement.

Caregiver Depression

Two articles, Rouse et al. (2020) and LaForett et al. (2017) examined the relationship between maternal depression and school readiness. Rouse et al. (2020) explained that maternal depression leads to fatigue and a lack of interest which affects caregivers' ability to provide cognitively stimulating environments and engaging parent-child interactions. LaForett et al. (2017) suggested that caregiver depression was inversely associated with parental beliefs in the value of play.

Racism

Three articles discussed the influence of racism on school readiness (Coba-Rodriguez et al., Halfon et al., 2020; Washington et al., 2020; Wolf et al., 2017). Halfon et al. (2020) described racial inequities that begin at birth and continue throughout one's life. These persistent and significant inequities create disparities in outcomes, including school readiness. They explain that policies that aim to improve outcomes must focus on prevention of emerging risks early in a child's life, while they are still malleable (Halfon et al., 2020). Wolf et al. (2017) described the impact of race on the experience of poverty. Segregation, a product of racism, is still salient in the lives of children of color as they experience the effect of generational neighborhood poverty due to chronic, on-going

disinvestments in their communities (Wolf et al. 2017). Racism effects school readiness in other ways as well. Washington et al. (2020) explained that implicit and explicit racial biases lead to harsher discipline of children of color, which affects their attitudes about and performance in school. Finally, Coba-Rodriguez et al. (2022) explained that assessments of school readiness and school performance do not accurately reflect performance for children of color as they are developed and normed with white, middle-class children in mind.

Factors that Promote School Readiness

Contextual factors that promote school readiness can be captured in three themes: high quality early language and literacy environments, play-focused learning opportunities, and positive parent-child relational health. The themes are further developed below.

High-Quality Home Literacy Environments

Home literacy environments can be used to describe the literacy-related interactions and activities that children experience at home (Hamilton et al., 2016). Several articles discussed the importance of high-quality home literacy environments (Abudulaziz et al., 2021; Bigelow et al., 2018; Coba-Rodriguez et al., 2020). One additional article described the importance of material learning resources in the home, such as books and educational toys (Murphy et al., 2022).

Play-Focused Learning Opportunities

Two articles described the importance of play-focused learning opportunities (LaForett et al., 2017; Roby et al., 2021). LaForett et al. (2017) found large variation in parents' endorsement of the idea that play is supportive of learning. Further, there is a variation in caregivers' interpretations of the term *play*. Some caregivers define play as an opportunity to foster learning by setting up the play environment and engaging with the child in play activities. This is often labeled as guided play (Fisher et al., 2011). Other caregivers define play as an opportunity for the child to engage in activities on their own. This is often called *free play* (Fisher et al., 2011). Interpretation of the term may affect caregivers' perception of its importance (LaForett et al., 2017). Roby et al. (2021) explained that caregivers may need information and resources on guided play. They suggested resources tailored to the developmental age of the child, with goals and strategies for guided play (Roby et al., 2021).

Positive Parent-Child Relational Health

The positive parent-child relational health theme includes subthemes of positive parent-child interactions; absence of harsh discipline and child maltreatment; secure attachment; and parent efficacy, coping skills, and behavioral regulation. Williams et al. (2019) discussed the importance of consistency, developmentally-sound, and emotionally supportive early experiences. Magnuson et al. (2019) described the importance of parental self-regulation, executive function, flexibility, and self-control, while LaForett et al. (2017) focused on parental self-efficacy.

Several articles described the importance of parent education programs that teach parents skills, promote self-awareness, support parents' ability to cope with the challenges of parenting (Conway et al., 2018; Grindal et al., 2016; LaForett et al., 2017; Lahti et al., 2019).

Discussion

This scoping review examined the similarities and differences in common definitions of school readiness or the effect of home visiting on academic outcomes. Further, we explored contextual factors that may impede or promote school readiness in the home environment. We found variability in definitions of school readiness, with each article describing it differently. Further, we discovered that most articles did not discuss school readiness broadly, rather authors focused on individual-level domains of readiness. This contrasts with gray literature that typically defines school readiness as a concept that extends beyond individual readiness to the readiness of families, communities, and schools (U.S. Department of Health and Human Services, 2022). This may be due to the difficulty of measuring non-individual level components; however, it is important to consider the implications of the lack of research on the concept of school readiness. A clear definition of and research on the concept of school readiness is needed for interventions that aim to improve outcomes in this area. Further, it is difficult for practitioners to piece together research on various domains when making evidence-informed program decisions.

We also found common themes in the impeding and promoting contextual factors present in the articles. The process of creating themes to group contextual factors

categories was challenging. The inverse of some impeding factors could be considered a promoting factor. For example, while most articles discussed low SES as a potential impeding factor, Conway et al. (2018) described high SES as a promotive factor. Also, impeding factors were often described as problematic in the way they act upon promoting factors. For example, Magnuson et al. (2019) explained that low SES (an impeding factor) is inversely associated with positive parent-child relational health (a promoting factor). Additionally, it is challenging to isolate the effect of contextual factors, as prior research has shown that unemployment, single parenthood, and low SES were interrelated (Brown, 2008, 2015; Brown & Lee, 2017; Johnson et al., 2012).

Further, families may have more than one contextual risk factor, and the cumulative effect of multiple risk factors may be more difficult for families to overcome than any one factor (Pratt et al., 2016). There may also be a differential impact of certain combinations of risk factors (Williams et al., 2019). Future research should consider the additive/interaction effects of these contextual factors that may have important implications for developmental outcomes, including school readiness (Pratt et al., 2016; Williams et al., 2019).

Finally, there are several equity considerations of this work. First, when describing impeding factors of poverty, teenage parenthood, and single parenthood, it is important not to place responsibility on individual-level characteristics or traits. For example, including poverty as an impeding factor should not suggest that individuals in poverty are deficient parents. In addition, it is important to consider the equity implications of language. For example, we decided to use single and teenage *parenthood* and *caregiver* depression, rather than single and teenage *motherhood* and *maternal*

depression because using the terms motherhood and maternal implies that caregivers and birthing parents are always female, minimizing the experience of fathers, non-parental caregivers, transgender and non-binary caregivers. We used *racism* in cases where the author discussed racism or race as a contextual factor. Race is a social construct and is not itself an impeding factor, rather it is the systemic historical and ongoing oppression of people of color that creates impediments. Further, researchers should use caution when grouping individuals into categories. Doing so implies homogeneity and there is limitless variation in families within SES, race, ethnicity, and other commonly used contextual demographic groupings (Coba-Rodriguez et al., 2020).

Limitations

The topic of school readiness and associated domains is expansive. Each domain of school readiness could be the subject of its own review. This scoping review only examined each domain in the context of in-home interventions. It may be useful to conduct additional literature reviews regarding interventions that aim to improve school readiness delivered in other settings, such as medical (e.g., Healthy Steps) and academic settings (e.g., Head Start). Literature in these areas may shed light on important contextual factors that are not present in this review. Further, this review did not include contextual factors related to child health. For example, we did not include literature on the association between birth outcomes and school readiness. Also, we did not explore associations between child health and the broader interpersonal, community, and societal contexts. Finally, we did not examine articles that described associations between home

visiting and academic outcomes in primary or secondary school. Future reviews should consider the impact of home visiting interventions beyond school entry.

Conclusion

The findings of this scoping review add to the knowledge of how researchers define school readiness, the extent to which the effect of home visiting on school readiness has been examined, and the factors that may impede or contribute to school readiness and moderate home visiting's effect. School readiness definitions vary, and few studies examine the effect of home visiting. Future research should aim to develop a common definition and conceptual model of school readiness. These findings identify important contextual factors; however, additional research is needed to understand how these factors moderate specific components of the home visiting intervention. This research is necessary for home visiting researchers, policy makers, and practitioners to tailor the intervention to effectively meet families' needs.

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PAPER 2: SCHOOL READINESS AMONG CHILDREN WHO RECEIVED HOME VISITING SERVICES IN ALABAMA

by

HEATHER H. JOHNSON, DAVID BECKER, MARGARET ENLOW, MARTHA S. WINGATE, MATTHEW FIFOLT, CANDACE KNIGHT, JULIE PRESKITT

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INTRODUCTION

School readiness is a multidimensional concept that includes a child's readiness to successfully participate in school, a family's readiness to support their child's learning, and a community's readiness to promote learning (Early Head Start, n.d.; Britto et al., 2012; Williams & Lerner, 2019). The nature of a child's early environment as well as the relationship between the child and their primary caregiver influences whether a child will be ready for school. The early years of child development provide opportunities for growth and resilience-building but are also a time of vulnerability. Early child experiences have lasting consequences for health and well-being, with impacts extending throughout their lifetime and beyond to future generations (Halfon & Hochstein, 2002; Shonkoff et al., 2000).

Home visiting, a two-generation intervention, has the potential to improve child and family well-being in multiple areas including various domains of school readiness (Health Resources and Services, n.d.). Home visiting programs are designed to provide services to families that are at higher risk for poor educational outcomes due to poverty and other risk factors (Health Resources and Services Administration, 2023). Poverty, and associated challenges, such as food and housing insecurity, may cause high levels of stress that impact a young child's brain development (National Scientific Council on the Developing Child, 2014; National Scientific Council on the Developing Child, 2015; Pascoe et al., 2016, Shonkoff & Garner, 2011). Other factors including maternal depression, substance use disorders, and family violence, including intimate partner

violence and child maltreatment, may lead to toxic stress and place children at risk for poor outcomes during their life course (Harvard University, Center on the Developing Child, 2015; National Scientific Council on the Developing Child, 2014; Noble et al., 2015; Pascoe et al, 2016; Shonkoff et al., 2012). Home visiting is well positioned to make a positive impact in the first three to five years of life, which is a time when child level factors are established, such as biological reactions to stress and behavioral coping strategies, as well as family level factors, such as attachment and quality parent child interaction (Campbell & Ramey, 1994; U.S. Department of Education, 1994).

School readiness programs can ease the transition between the infant/toddler years and elementary school, and may also promote improvements in later life outcomes, such as behavioral problems, high school dropout, delinquency, and unemployment (Bonifacio, 2019; Heckman, 2007: Knudsen, 2006; Pianta, 2002; Ricciadi et al., 2021; Williams; 2019; Zuckerman & Halfon, 2003). The premise of home visiting is to provide support to families during the period from birth to kindergarten entry to give children the best chance to be successful in kindergarten and provide them a foundation for success throughout their academic progression and beyond. This support provides children and their families with access to resources, improving overall well-being (Health Resources and Services Administration, 2022). These benefits can then be passed on to subsequent generations (Health Resources and Services Administration, n.d.).

While school readiness is one of the main goals of home visiting, studies on the impacts of home visiting show equivocal results, and studies that demonstrate statistically significant results show small effect sizes (Association of State and Tribal Home Visiting Initiatives, 2019; Home Visiting Evidence of Effectiveness, n.d.; MDRC, 2020;

Michalopoulos et al., 2019; Michalopoulos et al., 2019). There are several factors that make studying effects of home visiting difficult. First, unlike many early childhood programs, such as pre-kindergarten (pre-K) programs, home visiting may take place at different points in time, for varying durations, and at varying intensities. Home visiting, broadly speaking, serves families prenatally until kindergarten entry, however, some models focus on serving families with children of certain ages. For example, Nurse Family Partnership (NFP) serves families prenatally until the child's second birthday (Nurse Family Partnership, 2023), while Home Instruction for Parents of Preschool Youngsters (HIPPY) serves families with children who are two to five years of age (HIPPY USA, n.d.). Also, while some families may participate in home visiting for only a few weeks, others may participate for years. Some families receive one visit per month, while others receive one visit per week (Black et al., 1995; Cupples et al., 2011; LeRoux et al., 2010; Lee et al., 2008; McLaughlin et al., 1992; Nair et al., 2003; Peacock et al., 2013). There are very few studies that have examined the relationship of home visiting *dose* to outcomes. A study by Lyons-Ruth and Melnick (2004) found that teacher-rated hostile behavior patterns in children decreased as the dose of home visiting increased. Another study by Le Roux et al. (2010) showed a similar relationship between dose and response when studying the association of home visiting and recovery from child malnutrition in South Africa. However, to our knowledge there have been no similar studies related to school readiness measures.

Research into the impact of home visiting on school readiness is complicated by the fact that these programs typically target children from families with multiple risk factors (e.g., poverty, low caregiver educational attainment, caregiver mental health

concerns). (Alabama Department of Early Childhood Education, 2022). These factors are associated with poor academic outcomes (Harvard University Center on the Development Child, 2015; National Scientific Council on the Developing Child, 2014; Noble et al., 2015; Pasco et al., 2016; Shonkoff et al., 2012). However, there are few subgroup analyses that have looked at which risks, or combination of risks, are most associated with school readiness within the home visiting population.

Finally, there is a complex interplay between risk level and program duration. Typically, attrition within home visiting programs is high (Duggan et al., 2004; Duggan et al., 2009; DuMont et al., 2008; McLaughlin et al., 1992; Nair et al., 2003). Very few families receive the duration and intensity of home visiting that is recommended by home visiting models. Additional research is needed to explore the interaction between home visiting dose and family risk characteristics and their association with school readiness outcomes.

Maternal, Infant, and Early Childhood Home Visiting in Alabama

The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) is a federal program administered by the Health Resources and Services Administration (HRSA) in partnership with the Administration for Children and Families (ACF), within the United States Department of Health and Human Services (HHS). The purpose of MIECHV is to provide voluntary, evidence-based home visiting services to support "pregnant people and parents with young children who live in communities that face greater risks and barriers to achieving positive maternal and child health outcomes" (Health Resources and Services Administration, 2023, para. 1).

The Alabama Department of Early Childhood Education (ADECE) is Alabama's designated lead agency for MIECHV-funded home visiting. The *First Teacher* home visiting program began home visiting service delivery in 2011 to 13 of the state's most at-risk counties (Wingate et al., 2014). In 2013, services were expanded to an additional 30 counties. As of 2022, home visiting was provided in all 67 counties. MIECHV funds are used to provide services in 43 counties (Alabama Department of Early Childhood Education, 2020).

Alabama home visiting services are provided using several home visiting models, including Parents as Teachers (PAT) and HIPPY (Alabama Department of Early Childhood Education, 2020). PAT serves women prenatally through the child's entry into kindergarten. PAT uses paraprofessionals in the role of home visitors and focuses on maternal and child health, improved parenting skills and parent child interaction, and school readiness (Parents as Teachers, 2022). HIPPY serves children, ages two through five, using a 30-week curriculum with a strong focus on school readiness. The HIPPY model aims to train parents who once participated in the program to provide services (HIPPY USA, n.d.).

Study Purpose

The purpose of this study was to examine the relationship between the receipt of home visiting and school readiness measures in Alabama. Specifically, we wanted to know if there was a difference in performance on measures of school readiness at pre-K entry between children who participated in home visiting and those who did not. We

hypothesized that children who participated in home visiting would perform better on measures of school readiness compared to their peers who did not.

Methods

Sample

A list of all children who received MIECHV-funded, First Teacher Home Visiting during the time period of 4/1/2014 through 9/30/2020 was retrieved from the Social Solutions Efforts to Outcomes (ETO) (Efforts to Outcomes, 2023) database maintained by the University of Alabama at Birmingham on behalf of the Alabama Department of Early Childhood Education (ADECE). This list was matched with the list of all children who enrolled in First Class Pre-K (FCPK, a voluntary pre-K program for four-year-old children), during the 2018/2019 and 2019/2020 school years, retrieved from the FCPK database maintained by ADECE. Since there is not a unique identifier available in both datasets, children were matched using a six-point algorithm. Children from the home visiting database were identified in the pre-K data by matching on child's first and last name, gender, date of birth, race, county of residence, and parent's first and last name. An exact match was required on child's name, gender, date of birth, and either county or parent name. Questionable matches were verified by a second reviewer. In cases where a consensus on inclusion was not reached, the cases were excluded from the analysis.

Data

This study examined the school readiness scores of children receiving pre-K in the FCPK program. Students in FCPK are assessed using the Teaching Strategies Gold®

(GOLD) assessment. The GOLD assessment is administered at three points during the pre-K school year, fall, winter, and spring, however, fall scores were used for these analyses because school readiness at kindergarten entry was the outcome of interest. GOLD is an ongoing, observation-based, research-validated assessment system (Kim et al., 2013; Lambert et al., 2010). The GOLD assessment includes 38 objectives across six domains of development (social-emotional, physical, language, cognitive, literacy, and math) that are associated with school success based on school readiness standards (Kim et al., 2013; Lambert et al., 2010). Although the GOLD assessment is administered by teachers and has some degree of subjectivity, Alabama teachers receive extensive training and interrater reliability is established through a certification process where teachers evaluate and score sample child portfolios. To earn the certification, teachers must reach 80% agreement with master ratings established by GOLD (My Teaching Strategies Support, 2018).

Statistical Analysis

Two approaches were used to analyze the impact of home visiting on school readiness. In the first approach, multivariable linear probability models were used to investigate the association between receiving home visiting and meeting widely held expectations (WHE) in social-emotional, physical, language, cognitive, literacy, and math skills at pre-K entry. The models controlled for the following student demographic characteristics: poverty status, race/ethnicity, and gender. Pre-K classroom level *fixed effects* were used to account for unobservable, time invariant classroom-level factors (e.g., teacher assessment scoring approach, and classroom resources). Analyses were

performed using STATA© software, version 17 (STATA Corp LLC, College Station, TX).

The second approach involved matching students who received home visiting services with students who did not receive home visiting within the same pre-K classrooms. Thus, pre-K classrooms that did not have any students who had received home visiting services were excluded from the analysis. Students who received home visiting were matched to control classmates on race/ethnicity, gender, and poverty status. The use of this explicit matching approach was designed to explore the sensitivity of our results to the use of alternative methods to control for baseline differences in child characteristics by home visiting status.

In both analytic methods, receipt of home visiting was defined as participation in at least six months of home visiting services, prior to enrollment in the pre-K program. The six months of home visiting services was calculated as the sum of all participation rather than as six months of continuous services. Students who received home visiting after enrollment in pre-K and students who received less than six months of services were excluded from the analyses. This study was reviewed and approved by the University of Alabama at Birmingham Institutional Review Board.

Results

Demographics

There were 34,633 children enrolled in the FCPK program during the 2018/2019 and 2019/2020 school years. Of those, 662, or 1.7%, had been or were currently enrolled

in home visiting services. Children enrolled in home visiting were more likely to be black and live in poverty.

Table 1

Overall Demographics of First Class Pre-K Sample, 2018/2019 and 2019/2020 School Years[1]

	All	Home Visiting		No Home Visiting		
	N	N	%	N	%	Chi Square
Total	37,633	662	1.7	36,971	98.2	
Poverty Status						36.0*
Poverty	33,411	636	96.1	32,775	88.7	
Non-Poverty	4,444	26	3.9	4,196	11.3	
Race/Ethnicity						106.1*
Black	15,180	386	58.3	14,794	40.0	91.9*
White	17,660	192	29.0	17,468	47.2	87.6*
Hispanic	2,809	45	6.8	2,764	7.5	0.4
Other/Multi	4,269	74	11.2	4,194	11.3	0.0
Gender						0.8
Female	18,867	320	48.3	18,547	50.2	
Male	18,762	341	51.5	18,421	49.8	

* Statistically significant at $p < 0.05$

Statewide GOLD Performance

Across the 2018/2019 and 2019/2020 school years, at least half of all children entered pre-K meeting or exceeding WHE in language (54.5%), literacy (53.4%), social emotional (51.0%), and physical (55.6%) domains. A little less than half of all children enter pre-K meeting or exceeding in the cognitive (48.3%) domain, and well under half in

[1] Poverty status is based on Alabama Department of Early Childhood Education (ADECE) administrative data. Poverty indicated receipt of income-based state or federal benefits (e.g., Temporary Assistance for Needy Family (TANF), Medicaid)

the math (33.9%) domain. Children who were meeting or exceeding WHE at pre-K entry were more likely to be white, female, and not in poverty.

Table 2a

Percent of Children Meeting Widely Held Expectations in Teaching Strategies Gold Domains, 2018/2019 and 2019/2020 School Years[2]

	Language			Literacy			Math		
	Y	N	Chi Square	Y	N	Chi Square	Y	N	Chi Square
	54.5	45.5		53.4	46.6		33.9	66.1	
Demographic									
Poverty Status			212.4*			328.6*			356.0*
Poverty	53.2	46.8		51.7	48.3		32.3	67.7	53.2
Non-Poverty	65.5	34.5		67.1	32.9		47.4	52.5	65.5
Race/Ethnicity			228.8*			104.4*			183.3*
Black	51.2	48.8	102.6*	52.6	47.4	5.8*	32.7	67.2	13.7*
White	58.0	42.0	155.0*	54.5	45.5	18.0*	35.7	64.3	46.7*
Hispanic	47.2	53.0	61.0*	46.4	53.6	56.2*	25.3	74.7	94.9*
Other/Multi	51.5	48.5	16.0*	51.2	48.8	8.6*	30.4	69.6	25.4*
Gender			62.3*			92.7*			13.1*
Female	56.6	43.4		56.0	44.0		34.9	65.1	56.6
Male	52.4	47.6		50.1	49.1		33.0	67.0	52.4

* Statistically significant at $p < 0.05$

[2] Poverty status is based on Alabama Department of Early Childhood Education (ADECE) administrative data. Poverty indicated receipt of income-based state or federal benefits (e.g., Temporary Assistance for Needy Family (TANF), Medicaid)

Table 2b

Percent of Children Meeting Widely Held Expectations in Teaching Strategies Gold Domains, 2018/2019 and 2019/2020 School Years

	Social Emotional			Physical			Cognitive		
	Y	N	Chi Square	Y	N	Chi Square	Y	N	Chi Square
	51.0	49.0		58.6	41.4		48.3	51.7	51.0
Demographic									
Poverty Status			54.5*			200.4*			274.8*
Poverty	50.3	49.7		57.3	42.7		46.8	53.2	
Non-Poverty	56.6	43.3		69.1	30.9		60.9	39.1	
Race/Ethnicity			80.0*			98.6*			232.8*
Black	48.5	51.5	61.6*	55.4	44.6	93.8*	44.0	56.0	176.2*
White	52.9	47.1	46.4*	60.7	39.3	65.7*	52.0	48.0	181.2*
Hispanic	50.4	49.6	0.5	60.1	39.9	2.7	44.4	55.6	17.7*
Other/Multi	52.1	48.0	2.0	60.1	39.9	4.8*	47.8	52.2	0.5
Gender			93.3*			66.7*			29.8*
Female	53.6	46.4		56.4	43.6		49.8	50.2	
Male	48.5	51.5		60.7	39.3		46.9	53.1	

* Statistically significant at $p < 0.05$

Home Visiting Participation

For these analyses, students were required to be enrolled in home visiting for a minimum of six months prior to pre-K entry. There were no statistically significant differences in participation in home visiting by demographic characteristics.

Table 3

Duration and Timing of Participation Among Those Who Received Home Visiting Services, By Home Visiting Model and Participant Demographics, 2018/2019 and 2019/2020 School Years[3]

Received at least Six Months of Home Visiting Prior to Enrollment in Pre-K						
	All Home Visiting Participants	Yes		No		
	Total N	N	%	N	%	Chi Square
Total	662	418	63.1	243	36.7	
Poverty Status						0.0
Poverty	636	402	63.2	234	36.8	
Non-Poverty	26	16	61.5	10	38.5	
Race/Ethnicity						7.8
Black	386	247	64.0	139	36.0	0.2
White	192	115	59.9	77	40.1	1.4
Hispanic	45	31	68.9	14	31.1	0.7
Other/Multi	74	51	68.9	23	31.1	1.1
Gender						1.4
Female	320	195	60.1	125	39.1	
Male	341	223	65.4	118	34.6	

* Statistically significant at $p < 0.05$

Multivariable Analysis

After controlling for demographics and pre-K classroom, there were no statistically significant differences among students who received home visiting compared to their counterparts who did not receive home visiting in any domain except for the cognitive domain. Students who received home visiting were on average 5.0 percentage points (coeff. = -.05; t = -3.33; $p < 0.05$) less likely to meet or exceed WHE in that area.

[3] Poverty status is based on Alabama Department of Early Childhood Education (ADECE) administrative data. Poverty indicated receipt of income-based state or federal benefits (e.g., Temporary Assistance for Needy Family (TANF), Medicaid)

Model indicates the home visiting model used to provide services. The two models included in the analyses are Parents as Teacher (PAT) and Home Instructions for Parents of Preschool Youngsters (HIPPY).

Students in poverty were less likely to meet or exceed WHE in language (-.04; -2.67; $p < 0.05$, literacy (-.04; -2.70; $p < 0.05$), and math domains (-.04; -2.59; $p < 0.05$) than students not in poverty. Males were less likely to meet or exceed WHE in language (-.04; -10.88; $p < 0.05$), literacy (-.05; -12.02; $p < 0.05$), math (-.02; -5.19; $p < 0.05$), social emotional (-.05; -12.81; $p < 0.05$), physical (-.04; -10.74; $p < 0.05$), and cognitive domains (-.03; -8.50; $p < 0.05$) compared to females. Black children were less likely to meet or exceed WHE in language (-.03; -3.95; $p < 0.05$), literacy (-.02; -3.09; $p < 0.05$), math (-.02; -3.32; $p < 0.05$), and cognitive domains (-.02; -3.61; $p < 0.05$). Hispanic children were less likely to meet or exceed WHE in language (-.08; -7.10; $p < 0.05$), literacy (-.06; -6.14; $p < 0.05$), math (-.05; -4.95; $p < 0.05$), and cognitive domains (-.04; -4.35; $p < 0.05$); and children of other or multi races were less likely to meet or exceed WHE in language (-.03; -3.79; $p < 0.05$), and math domains (-.02; -2.79; $p < 0.05$).

Table 4a

Meeting Widely Held Expectations in Teaching Strategies Gold Domains, Multivariable Analysis, 2018/2019 and 2019/2020 School Years[4]

	Language (n=34,686)			Literacy (n=34,648)			Math (n=34,619)		
	Coeff.	T. Stat	95% CI	Coeff.	T Stat.	95% CI	Coeff.	T Stat.	95% CI
Characteristic									
Student Received Home Visiting	-.04	-1.90	-.07, .00	-.03	-1.72	-.07, .00	-.02	-1.01	-.05, .02
Student in Poverty	-.04*	-2.67	-.06, -.01	-.04*	-2.70	-.07, -.01	-.04*	-2.59	-.06, -.01
Male	-.04*	-10.88	-.05, -.03	-.05*	-12.02	-.05, -.04	-.02*	-5.19	-.03, -.01
Race/Ethnicity									
Black	-.03*	-3.95	-.04, -.03	-.02*	-3.09	-.04, -.01	-.02*	-3.32	-.03, -.01
Hispanic	-.08*	-7.10	-.09, -.05	-.06*	-6.14	-.09, -.04	-.05*	-4.95	-.07, -.03
Other/Multiple Race	-.03*	-3.79	-.05, -.02	-.02	-2.18	-.04, -.00	-.02*	-2.79	-.04, -.01
Pre-K Classroom	Absorbed								

* Statistically significant at $p < 0.05$

Table 4b

Meeting Widely Held Expectations in Teaching Strategies Gold Domains, Multivariable Analysis, 2018/2019 and 2019/2020 School Years[4]

	Soc. Emotion (n=34,712)			Physical (n=34,771)			Cognitive (n=34,611)		
	Coeff.	T. Stat	95% CI	Coeff.	T Stat.	95% CI	Coeff.	T Stat.	95% CI
Characteristic									
Student Received Home Visiting	-.03	-1.93	-.07, .00	-.04	-1.9	-.07, .00	-.05*	-3.33	-.09, -.02
Student in Poverty	-.00	-0.12	-.03, .03	-.02	-1.65	-.05, .00	-.01	-0.41	-.03, .02
Male	-.05*	-12.81	-.05, -.04	-.04*	-10.74	-.05, -.03	-.03*	-8.50	-.04, -.02
Race/Ethnicity									
Black	-.02	-2.54	-.03, .00	.00	0.35	-.01, .01	-.02*	-3.61	-.04, -.01
Hispanic	-.02	-1.81	-.04, .00	.00	0.32	-.02, .02	-.04*	-4.35	-.06, -.02
Other/Multiple Race	-.01	-0.62	-.02, .01	-.01	-0.71	-.02, .01	-.01	-1.49	-.03, .01
Pre-K Classroom	Absorbed								

* Statistically significant at $p < 0.05$

[4] Poverty status is based on Alabama Department of Early Childhood Education (ADECE) administrative data. Poverty indicated receipt of income-based state or federal benefits (e.g., Temporary Assistance for Needy Family (TANF), Medicaid)

Within Classroom Match

When children who received home visiting were matched with those who did not, within the same pre-K classroom, the percentage of children who met WHE across the treatment and control group was nearly identical, indicating zero effects of the home visiting intervention.

Table 5

Meeting Widely Held Expectations in Teaching Strategies Gold Domains, Within Classroom Match, 2018/2019 and 2019/2020 School Years[5]

GOLD Domain	Treatment (N=336)	Controls (N=1731)	P Value
Language	47.5%	47.5%	Not Significant
Literacy	46.1%	46.2%	Not Significant
Math	28.6%	28.4%	Not Significant
Social Emotional	47.6%	47.3%	Not Significant
Physical	50.3%	51.1%	Not Significant
Cognitive	38.2%	38.3%	Not Significant

Discussion

This is the first study to examine the effects of home visiting on school readiness in Alabama. As expected, home visiting participants are demographically different than their non-home visiting peers within the FCPK program. The FCPK program is open to all four year olds, but sites are prioritized to communities with higher levels of poverty and poorer school performance. This is important because while both programs aim to serve marginalized and disadvantaged children, such as children in poverty and children

[5] Teaching Strategies Gold (GOLD) is the standardized assessment used in First Class Pre-K (FCPK).

of color, the home visiting program serves a higher proportion of these children compared to FCPK.

Although these analyses do not show improved performance for children who received home visiting compared to their non-home visiting counterparts, there is no statistically significant difference either way. This is an important finding given that one might expect poorer performance among children who received home visiting due to their increased risk factors, such as poverty. This finding was consistent between both analytic techniques with the matched sample providing stronger evidence of the null result.

Limitations

Data used to determine school readiness were based on the well-known and commonly used GOLD assessment. While the assessment tool is recognized as a valid, reliable tool, all assessments have inherent weaknesses. School readiness is a complex topic and can be defined and measured in different ways. For example, some definitions describe school readiness as a concept that extends beyond the individual readiness of the child to the readiness of families, communities, and schools (U.S. Department of Health and Human Services, 2022), yet standardized assessments are only measuring child-level readiness. Further, particular skills may be valued by some and not by others, so there is a lack of consensus on how to evaluate whether children are ready. Finally, the GOLD is a teacher-completed assessment, making it more subjective than some standardized tests. However, Alabama pre-K teachers are required to receive training on the GOLD and inter-rater reliability is established. While our statistical analysis attempted to account for differences in teacher training and skills by controlling for classroom-level fixed effects,

there may be some non-random differences in test administration, teachers, and classrooms, including harsher assessment of minority students and students in poverty (Quinn, 2020; Steinberg & Sartain, 2021), for which we have not accounted.

There are several limitations in the pre-K and home visiting data used for our analyses. First, we do not have access to more detailed home visiting participation data. While we limited our analysis to children who received at least 6 months of home visiting, we did not have data on the nature of the participation in the program. Specifically, we could calculate how long each child had been enrolled in a home visiting program (the duration), but not the number of home visits received during that time (the intensity) or when in the child's lifespan the visits took place (the timing). This is an important limitation because some studies of home visiting have linked an increase in the intensity of home visiting services to improved outcomes.

In addition, we have very limited data about the nature of the child's family, home environment, and community. These additional contextual factors are critical in understanding the degree to which a child is at risk for poor educational outcomes. Because of the limitations in our data, we only controlled for basic demographic characteristics, such as gender, poverty, and race/ethnicity. These demographic characteristics do not describe the complex nature of the child's home and community environment or the level of historic and ongoing systemic marginalization and oppression that impact children and their families. Accounting for these complexities is critical in future research in this area, as they may explain differences in academic performance that are unaccounted for in these analyses.

Conclusions

This study did not find any statistically significant differences in measures of school readiness for children who participated in home visiting compared to their peers who did not. However, future research should further define the concept of school readiness, the theory for how home visiting may impact outcomes in this area, and how to more appropriately control for child, family, community, and societal-level context factors, as well as the duration, timing, and intensity of home visiting participation, that may differentially impact academic performance.

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PAPER 3: PROMOTION OF SCHOOL READINESS IN HOME VISITING: CREATING A KEY DRIVER DIAGRAM FOR CONTINUOUS QUALITY IMPROVEMENT

HEATHER H. JOHNSON, MATTHEW FIFOLT, CANDACE KNIGHT, MARTHA S. WINGATE, DAVID BECKER, JULIE PRESKITT

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INTRODUCTION

School readiness is defined as "possessing the skills, knowledge, and attitudes necessary for success in school and for later learning and life" (U.S. Department of Health and Human Services, n.d., para. 1). There are multiple domains of child development associated with school readiness, including physical, cognitive, social, and emotional development. Language, literacy, and pre-math skills are important components as well. School readiness extends beyond just the readiness of the child. It also includes assuring that families and communities are prepared to support children and that schools are ready to receive and educate them (U.S. Department of Health and Human Services, n.d.).

Improved school readiness and achievement is one of the six primary benchmarks for improvement assessed by the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) (Health Resources and Services Administration, 2022). In fact, the link between home visiting services and increased readiness for school and later academic achievement features prominently in the logic models of two evidence-based, home visiting models: Home Instruction for Parents of Preschool Youngsters (HIPPY), and Parents as Teachers (PAT) (HIPPY USA, 2022; Parents as Teachers, 2022). However, families receiving home visiting services have varied family and community-level resources and risk factors and may need different supports to prepare their children for school entry. Addressing this heterogeneity in resources and needs is difficult, especially when attempting to address a complex issue, such as school readiness

(Mohajer & Earnest, 2010; Young, 2014). Therefore, home visitors need precise solutions that may be tailored based on the needs and strengths of families.

Furthermore, despite the interest and focus, there is a lack of evidence about the effectiveness of home visiting at improving school readiness outcomes (Paper 1). An analysis of Teaching Strategies GOLD© scores of pre-kindergarten students who received home visiting compared to their peers who did not, showed no statistically significant differences in any of the domains of the assessment (e.g., literacy, language, cognitive, physical, math, social emotional) (Paper 2). The importance of the topic in the field, the lack of information about best practices or strategies and their relative effectiveness, and opportunities for improvement in performance are indications of an outcome that presents opportunities for program improvement through Continuous Quality Improvement (CQI) methods.

CQI in MIECHV

CQI is the "process of identifying, describing, and analyzing strengths and problems and then testing, implementing, learning from, and revising solutions" (Education Development Center, n.d., para. 2). CQI is a statutory requirement of the MIECHV legislation (Maternal, Infant, and Early Childhood Home Visiting Programs, 2013). Each state and territory must create a CQI plan and participate in CQI activities on an annual basis (MIECHV Data and Continuous Quality Improvement, 2022). Each awardee may choose their topic of focus, based on challenges identified through data collection and reporting and/or through engaging interested parties including families, home visiting staff, state-level staff, and other partners in conversations about projects of interest and importance (Poes et al., 2017).

Key Driver Diagrams (KDD) are an important part of CQI projects (Bennet & Provost, 2015; IHI, n.d.; Williams et al., 2019). KDDs may be used as an evaluation tool to help visualize program delivery across different contexts, an implementation planning tool, or as a tool to help visualize an overall theory of change within CQI projects (Bennet & Provost, 2015; Williams et al., 2019). The tool is useful in all areas to understand program-specific context and ultimately what works best, for whom, and under what circumstances (Williams et al., 2019). In a KDD, research, experience, and observation inform the shared theory of how a system, program, or team makes improvements (Bennett & Provost, 2015).

KDDs include three components: an aim, primary drivers, and secondary drivers. Aims are defined as goals or objectives of the work. Aims should be SMARTIE (specific, measurable, attainable, relevant, time-bound, inclusive, and equitable) (Maternal, Infant, and Early Childhood Home Visiting Technical Assistance Resource Center, n.d.). Primary drivers, or key drivers, are system-level factors that contribute to achieving the aims. Secondary drivers are lower-level factors that are necessary to achieve improvement in the primary drivers (Center for Medicare and Medicaid Services, 2013). The KDD provides a simple diagram that represents the relationship between secondary drivers, primary drivers, and aim (Center for Medicare and Medicaid Services, 2013).

Developing a KDD involves a review of the literature and engagement of experts in the fields of interest (Poes et al., 2017). While CQI state leads in Alabama developed KDDs for previous CQI projects (Fifolt et al., 2022), this is the first effort to engage experts in the field in the development of a KDD. Further, this represents the first effort

to use online focus groups as a method of qualitative data collection for CQI and KDD development within the home visiting field in Alabama.

MIECHV in Alabama

Alabama home visiting services are provided using Parents as Teachers (PAT), Home Instruction for Parents of Preschool Youngsters (HIPPY), and Nurse Family Partnership (NFP) models (Alabama Department of Early Childhood Education, n.d.). PAT serves families prenatally through the child's entry into kindergarten. PAT uses paraprofessionals in the role of home visitors and focuses on maternal and child health, improved parenting skills and parent child interaction, and school readiness (Parents as Teachers, 2022). HIPPY serves children, ages two through five, using a 30-week curriculum with a strong focus on school readiness. The HIPPY model aims to train parents who once participated in the program to provide services (HIPPY USA, n.d.). NFP uses specially trained nurses to serve first-time parents, enrolled prior to 28-weeks gestation through the child's second birthday (Nurse Family Partnership, 2023).

Alabama MIECHV has a history of success in using CQI to address program challenges and improve home visiting processes and performance. In 2017, Alabama's home visiting program embarked on a CQI project aimed at improving program performance in tobacco cessation promotion. As a result of these efforts, 60% of tobacco users at participating local implementing agencies (LIAs) made at least one attempt to quit smoking (Fifolt et al., 2019). In 2018 and 2019, the state team turned their efforts to depression screening and referrals with an aim to reduce depression symptomology among primary caregivers who screened positive for depression. By the end of the

project, Alabama's referrals to mental health services for caregivers with a positive depression screening increased from a baseline of 60.5% to 86.9%. In addition, the percentage of caregivers who experienced improvement in depression symptomology, increased from a baseline of 26.9% to 72.9% (Fifolt et al., 2022).

The purpose of this paper is to add to the literature regarding home visiting and school readiness, and to use online focus groups as a method of qualitative data collection to develop a KDD that may be used in home visiting practice in Alabama when working toward improvement in school readiness outcomes.

Methods

Design

A qualitative design was used in the development of the CQI driver diagram due to the value of understanding the nuance of interventions and their relative importance to school readiness. In addition, understanding how add-on interventions may complement existing home visiting models in Alabama's specific context required rich detail and in-depth conversation that qualitative approaches afford.

A synchronous online focus group was used to gather information for this study. This method was deemed most appropriate for our purposes for several reasons: (1) Online focus groups allow for participation without participants needing to travel or request time off from work. This worked well given that study financial constraints did not allow for reimbursement of participants; (2) Previous research suggests that virtual focus groups produce more ideas compared to in-person groups (Reid & Reid, 2005); and (3) The focus group only had one moderator who also functioned in a note-taking role.

Conducting the group virtually allowed for the meeting to be recorded and notes to be transcribed after the meeting.

Focus group participants were recruited using purposive sampling (Kelly, 2010). Given the nature and intent of the focus group, it was important that participants had specific expertise and/or experience in home visiting, pre-K, or early childhood care and education more broadly. In addition, we aimed to bring together a diverse range of expertise and experience, including home visitors, home visiting program supervisors, state-level home visiting data and CQI staff, pre-K teachers, pre-K administrators, and early childhood education researchers. The Alabama Department of Early Childhood Education, which administers Alabama's First Teacher home visiting program and First Class Pre-K (FCPK) programs, and The University of Alabama at Birmingham, which serves as Alabama's MIECHV evaluation, data and CQI leads, submitted a list of potential participants. Each prospective participant was sent an email invitation to participate, with more information about the project.

Participants met for two, 90-minute meetings. A discussion guide and corresponding slides were prepared for the meetings, and participants were sent a list of questions and an agenda in advance of each meeting. The meetings were hosted using the online Zoom platform (Zoom, 2022). Google Jamboard (Jamboard) (Google Jamboard, n.d.) was used to provide a vehicle for anonymous contributions during, between, and after the meetings.

Table 1

Discussion Questions for Online Focus Group

Meeting 1 Questions
What comes to mind when you think about school readiness?
What are the components of school readiness? Of these components, which are more amenable to the home visiting intervention? Of these components, which are less amenable to the home visiting intervention?
Are there gaps in knowledge or practice when it comes to the promotion of school readiness? Are there groups who aren't thriving?
What can home visitors do to help caregivers prepare themselves and their children for kindergarten entry?
Meeting 2 Questions
(After reviewing the aim statements) Which aims do you like or dislike? Why?
What should we be trying to accomplish? Is that goal represented here?
(After reviewing the primary and secondary drivers) What is missing?
What edits would you suggest to phrasing or content?

Data Management and Analysis

Jamboard data were automatically saved to the lead author's Google account. Meetings were recorded, and meeting notes were transcribed by the lead author after the meeting concluded. The lead author engaged in thematic analysis, reviewing the transcripts and Jamboard, using phrases or words to hand code data. Codes were organized into topics, similar topics were grouped together, and overarching topics were identified and synthesized into themes. Focus group participants were sent a copy of the results in the form of a draft KDD, in advance of the second focus group meeting. Participants provided peer review of the KDD to validate themes and to ensure that their feedback was adequately captured. Feedback was provided via email in advance and during the second meeting. All feedback was incorporated, and the document was reviewed again. This iterative process concluded when expert participants had no additional feedback or requested revisions.

Results

Eleven participants attended at least one of two focus group sessions. Participants had experience in either early childhood education research, pre-K, or home visiting. Some participants served in multiple capacities, such as home visiting supervisors and former home visitors (see Table 2).

Table 2

Focus Group Participants

Participant	Program Experience	Session 1 Attendance	Session 2 Attendance
1	Early childhood education researcher		X
2	Early childhood education researcher	X	X
3	Early childhood education researcher	X	X
4	HIPPY home visiting program director	X	X
5	First Teacher Home Visiting program administrator; former PAT home visiting supervisor; former PAT & HIPPY home visitor		X
6	NFP home visitor	X	X
7	HIPPY/PAT home visiting program director	X	
8	PAT program director; former PAT home visitor	X	X
9	Pre-K regional director	X	X
10	Preschool to 3rd Grade initiative director	X	X
11	Head Start/Early Head Start program director	X	

Participants talked about the definition of school readiness. There was widespread agreement that school readiness is more than cognitive or academic skills, rather school readiness includes social emotional development, behavioral regulation, confidence, and an attitude of enthusiasm for learning. Participants also discussed how family and community support is critical in supporting a child's academic success.

Participants described multiple aims for school readiness in home visiting. Home visiting programs may choose to focus on one aim or multiple aims. Aims include: (1) Increase the number of family goals related to early learning, child development and/or school readiness from XX to YY, (2) Increase the number of connections/referrals made to First Class Pre-K programs from XX to YY, (3) 100% of children enrolled in HV will have at least one age-appropriate learning experience per day, and (4) 85% of children enrolled in HV, ages 3-4, will improve on pre-K skills for school readiness.

To achieve aims, participants stressed the importance of supporting both children and their caregivers, as well as partnerships between families, home visiting programs, and pre-K programs. Participants used Bronfenbrenner's (1979) Ecological Systems Theory as a guiding theory, focusing on multiple levels of interacting influences on the child (e.g., family, community). Child-level interventions, as well as interventions at the family, home visiting program, community, and early childhood education system-level were critical pieces in the theory of change. The resulting primary drivers represented these levels: children who are healthy, supported, and prepared to reach their full potential; families with the confidence and support to help their children learn and develop; home visitors with the knowledge and skills to promote school readiness; community resources to meet families' needs; partnerships between families, home visitors, and schools.

Figure 1

Key Driver Diagram for the Promotion of School Readiness in Home Visiting

Aims *What are we trying to accomplish?*	**Primary Drivers** *System-level components which contribute directly to achieving the aim.*	**Secondary Drivers** *Lower-level components which influence primary drivers.*
By MM/DD/YY, 1. Increase the number of family goals related to early learning, child development and/or school readiness from XX to YY. 2. Increase the number of connections/referrals made to First Class Pre-K programs from XX to YY. 3. 100% of children enrolled in HV will have at least one age-appropriate learning experience per day. 4. 85% of children enrolled in HV, ages 3-4, will improve on pre-K skills for school readiness.* *Will be measured using a tool such as the Alabama Partnership for Children's Pre-K Skills for School Readiness Checklist.	Children who are healthy, supported, and prepared to reach their full potential	Physical health
		Social and emotional well-being
		Behavioral regulation
		Self-help skills
	Families with the confidence and support to help their children learn and develop	Positive parent-child interactions
		Age appropriate early learning experiences
		Family leadership and advocacy
	Home visitors with the knowledge and skills to promote school readiness	Expertise of age appropriate development and early learning
		Understanding of local pre-K landscape
		Training and resources to provide equitable support to all families
	Community resources to meet families' needs	Economic supports
		Educational supports
		Social and behavioral supports
		Culturally appropriate services
	Partnerships between families, home visitors, and schools	Trusting, bi-directional relationships
		Shared understanding of school readiness
		Strengths-based support
		Family-led collaboration

Driver 1: Children who are healthy, supported, and prepared to reach their full potential

Participants expressed the importance of *whole-child development*, explaining that physical, mental, and emotional health are critical components of overall well-being. Home visitors should emphasize the importance of well-child medical visits and screen and refer children for developmental and behavioral concerns. In addition to health, participants described the importance of behavioral regulation and self-help skills to a

child's school readiness. At school, children are often expected to regulate their behaviors in new ways (e.g., walk in a straight line, remain quiet in hallways). Becoming accustomed to these expectations before arriving in kindergarten can alleviate stress for families and children. In addition, skills such as tying shoes, zipping and unzipping jackets, and opening a milk carton can ease a child's transition from a home environment to the school environment.

In addition, participants expressed interest in focusing on the natural development of the child. As one participant stated, "We do not have to make sure our children are 'ready to learn'. They are born ready to learn. We just need to make sure they are prepared for the school transition."

Driver 2: Families with the confidence and support to help their children learn and develop

Participants stressed the importance of positive parent-child interactions. Parent-child interactions are the dynamics between the parent and child. This didactic interaction is a critical pathway through which caregivers influence a child's development. There are multiple components, including behaviors, expectations, and emotions. Home visitors focus on parent child interaction in each home visit by providing caregivers with educational materials and tips for engagement with their child (Rudick et al., 2020). In addition, many home visiting models promote observations of parent-child interaction using a validated tool (Maternal, Infant, and Early Childhood Home Visiting Technical Assistance Resource Center, n.d.). However, added emphasis might be placed on increasing the percentage of families that receive the observation in a timely manner, or

the ways in which the home visitor and or home visiting program uses the screening results to inform practice.

Participants described the importance of supporting families to promote their children's learning and development. One theme that emerged is the importance of age-appropriate early learning experiences. Participants described these experiences as play-focused and naturally occurring. One participant stated, "We want families to feel encouraged that playing with their child is supporting their learning. They do not need fancy toys or specialized curriculum to do right by their child." Another participant described how these learning opportunities may be a part of everyday activities, rather than an added task. "Parents can just talk to their child when doing the laundry, for example. You can count the number of socks, sort socks into matches, talk about the color of the socks, and so on."

Participants stressed the need for home visitors to empower caregivers to advocate for their children. Home visiting describes caregivers as a child's "first and most influential teacher" (Parents as Teachers, 2022). As such, caregivers should feel confident to speak to their child's teachers about their child's personality and skills, and to advocate for necessary classroom supports. Participants agreed that home visiting should play a role in helping encourage and equip families to advocate for their child.

Driver 3: Home visitors with the knowledge and skills to promote school readiness

Participants agreed that home visitor training is an important driver of change necessary to meet the aims. While home visitors receive specialized training in the home visiting model curriculum, there are opportunities for state and local programs to provide more targeted training in important focal areas, such as school readiness (Schultz et al.,

2018). Three areas that may require additional investments in training are age-appropriate development and early learning, the local pre-K landscape, and equitable family supports. While child development is emphasized in home visiting curriculum, participants described the need to tie resources together, such as the Centers for Disease Control and Prevention's Developmental Milestones checklist (Centers for Disease Control and Prevention, 2022) to Alabama's Early Learning Standards (Alabama Department of Early Childhood Education, n.d.), especially for children who are close to entering kindergarten. Bridging the gap between the two sets of guidelines would help parents navigate the ways in which natural child development informs learning and skill development in a school setting.

Training regarding the pre-K landscape is necessary because local home visiting programs may be unaware of which pre-K programs are available in their community and what is involved in the application and enrollment process. This lack of knowledge prevents home visitors from sharing information about the pre-K application process to families (e.g., completing applications, gathering necessary paperwork). Ongoing training is important as the pre-K landscape changes each year through additional funded programs. Further, Alabama's FCPK program is a mixed-delivery system, consisting of public and private entities (Alabama Department of Early Childhood Education, n.d.). Different schools may have different application and enrollment requirements, therefore, training in the local context is critical.

Finally, participants agreed that additional training is needed in providing equitable support to families. Home visiting is not a *one-size-fits-all* approach, and different families need different resources to best support their child's school readiness

(Peters et al, 2021). However, more work is needed to tailor services and home visitors need training regarding how to discern which services are needed and to provide those services in a culturally responsive way. Participants noted the importance of training on historical and on-going systemic and structural racism, and the importance of equity-focused approaches in all elements of the home visiting system.

Driver 4: Community resources to meet the families' needs

Participants discussed the importance of adequate community resources that meet the economic needs of the family and the social, behavioral, and educational needs of the child. Home visiting aims to connect families with resources (Health Resources and Services Administration, 2022), but a tangible focus on each of these resource types may be needed at the local program level. For example, some local programs may have high rates of referrals to mental health services, but lower rates of referrals for economic support, such as housing assistance and Temporary Assistance for Needy Families (TANF). Overall, participants agreed that assessing social context and asking families about their needs, including housing, food access, health care access, and other social and economic needs, may be helpful. Participants expressed the belief that calling attention to each of these resource categories in the KDD will help programs consistently address each of these elements.

Finally, participants noted that more emphasis should be placed on identification of culturally responsive community resources. Participants described the need to assess community referrals for appropriateness, and the need to ask families for their reflections on the services provided. Home visiting programs may benefit from resources and training on ways to assess the level of cultural responsivity (Lopez et al., 2017).

Driver 5: Partnership between families, schools, and home visitors

There was consensus among participants that system-level coordination is necessary for large scale improvements in school readiness. This is consistent with other KDDs and policy recommendations aimed at improving other complex home visiting outcomes (Johnson et al., 2022; Simmons et al., 2022; Sturmfels et al., 2022). Trusting, bi-directional relationships between families and home visitors, and families and school systems are critical to coordination (Champine et al., 2019; Franklin, 2018).

Participants agreed that at all levels of the partnership, support provided to families should be strengths-based and family-led. Tools such as the Strengthening Families Protective Factors Framework may be adopted more broadly by both the home visiting and education systems to build family strengths and resiliency (Center for the Study of Social Policy, 2023). Finally, toolkits such as the Parent Leadership Toolkit may be useful in framing a discussion around parent led efforts to improve school readiness (Education Development Center, 2019).

Discussion

Limitations and Future Research

This study recruited participants who are experts in the fields of home visiting and early childhood education in Alabama. While findings may add to the relevance of the results in the Alabama context, it may hinder generalizability to other populations. Further, due to the economic constraints of this study, such as the inability to compensate experts for participation, families were not engaged in this process. The lived experience of families enrolled in the home visiting program is expertise that is critical to the

production of aims and drivers represented in the driver diagram. Their input is needed prior to any additional next steps.

This driver diagram represents the first of many steps toward a unified theory of change. In addition to family engagement, next steps include development of a change package which includes change ideas and resources for the field that correspond to each primary and secondary driver. Additional expert engagement is needed to identify those elements. Further, these change ideas will require iterative, small tests of change in the home visiting field using the Model for Improvement (Langley et al., 2009). The driver diagram will undergo multiple revisions based on what is learned from testing and may be modified to fit local program contexts.

Conclusion

Study participants confirmed that preparing children to enter school is an effort that requires intervention at multiple levels. It is important that home visitors play an active role in ensuring that children are healthy and have the supports they need to be successful, but also that families, home visiting programs, and communities are actively supporting children. Further, partnerships between families, home visitors, and schools will lead to increased school readiness for children and their families.

Ultimately, home visiting families need tailored supports that are based on their strengths and vulnerabilities. The profession of home visiting must get creative to address the system-level issues that prevent equitable access to supports that prepare children and their families for the type of success in school that leads to personal and professional

success later in life. CQI methodology provides important tools and strategies to tailor and improve the services provided to families enrolled in home visiting programs.

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CONCLUSIONS

The aims of this research were to understand the existing literature about home visiting and school readiness (Paper 1), to explore the association between home visiting and school readiness in Alabama (Paper 2), and to gather expert feedback about best practices for improving school readiness to inform Continuous Quality Improvement (CQI) efforts in home visiting (Paper 3). Paper 1 involved a scoping review to understand the details and gaps of existing literature regarding the definition of school readiness, home visiting's effect on school readiness, and the contextual factors that impede or contribute to school readiness.

In Paper 2, we examined two years of Teaching Strategies *GOLD®* *(GOLD)* data to study the differences among children who participated in Alabama's First Teacher Home Visiting Program and those who did not. Apart from the cognitive domain, we found no statistically significant differences in the test domains (physical, cognitive, social emotional, language, literacy, math). Children who participated in home visiting scored lower in the cognitive domain compared to those who did not. These findings influenced our decision to pivot from our original approach to Paper 3, which involved additional statistical analyses, to the development of CQI tools that would be useful to the field when attempting to improve school readiness outcomes.

Ultimately, the Key Driver Diagram (KDD) developed in Paper 3 provides a tool that incorporates research, experiential, and contextual evidence back to the field of home visiting that may address the following three findings from Papers 1 and 2: (1) There is

no clear, consistent definition of school readiness in the literature or in practice, making it very difficult for home visitors to know what they are trying to improve, (2) There is little understanding of how contextual factors impede or promote school readiness, making it difficult for home visitors to tailor services to meet the needs of individual families, and (3) there is no association between home visiting and GOLD scores in Alabama.

The research contributions from these three projects are (1) a greater understanding of the definition of school readiness, (2) a greater understanding of contextual factors and their impact on school readiness outcomes, (3) creation of a persistent marker for students who received home visiting within the ADECE databases resulting in greater data interoperability in early childhood data systems, (4) knowledge about the association between home visiting and school readiness in Alabama's First Teacher home visiting program, and (5) creation of a KDD that may be used immediately in the field of home visiting to improve school readiness outcomes for children.

Implications for Policy and Practice

This research has implications for both policy and practice. These implications can be grouped into three themes: the need for a precision approach, systems level coordination, and an equity focus. One important consideration for all three areas is the need for action at a systems level. Individual home visitors and home visiting programs may make improvements to practice, but large-scale improvements for children and families are more likely to occur when parallel changes happen at the state and federal levels (Morrison & Sparr, 2019).

Precision Approach

This research supports the need for a precision approach to home visiting. Precision home visiting is *home vising that differentiates what works, for whom, and in what contexts to achieve specific outcomes* (Home Visiting Applied Research Collaborative, n.d., para 1). The Precision Paradigm is an emerging research framework that reflects a shift toward a precise and comprehensive understanding of specific intervention components, including techniques and delivery methods; moderators, such as intervention usage, including reach and engagement; and context, including individual, family, organization, and community factors, and clearly defined outcomes. The Precision Paradigm also includes mediators, such as mechanisms of action and target behaviors that influence home visiting's effect on outcomes of interest (Home Visiting Applied Research Collaborative, n.d.).

Paper 1 focused on understanding the outcome and context more precisely, examining how school readiness is defined in current research and practice and what contextual factors may impede or promote school readiness. Paper 3 focused on understanding more about specific intervention components home visitors use to improve school readiness outcomes. However, several limitations of Paper 2 can be viewed through a precision lens. For example, we did not have access to detailed home visiting participation data. While we limited our analysis to children who received at least six months of home visiting, we did not have data on the nature of the participation in the program. Specifically, we could calculate how long each child had been enrolled in a home visiting program (the duration), but not the number of home visits received during

that time (the intensity) or when in the child's lifespan the visits took place (the timing). This limited our ability to precisely understand the details of the intervention's usage.

In addition, we had very limited data about the nature of the child's family, home environment, and community. These additional contextual factors are critical in understanding the degree to which a child is at risk for poor educational outcomes. Because of the limitations in our data, we only controlled for basic demographic characteristics, such as gender, poverty, and race/ethnicity. These demographic characteristics do not describe the complex nature of the child's home and community environment or the level of historic and ongoing systemic marginalization and oppression that impact children and their families. This limited our ability to precisely measure context. These limitations are a result of constraints in data collection and reporting. More precise measurement of contextual factors and program usage require collection of additional data elements. Support at the state and federal level to collect these nuanced data is important in our ability for precise measurement across home visiting models, local programs, and states and territories across the country.

Systems Level Coordination

Systems level coordination is critical for improving services and outcomes for children and families (Morrison & Sparr, 2019). This is especially important in improving outcomes in school readiness, as multiple contextual factors effect a child's readiness, including factors related to socioeconomic status (SES) (e.g., housing, caregiver education, income) (Abdulaziz, 2022; Coba-Rodriguez & Jarett, 2022; Fantuzzo et al., 2019; List et al., 2021; Magnuson & Schindler, 2019; Rouse et al., 2020),

caregiver well-being (e.g., caregiver mental health, substance misuse) (LaForett & Mendez, 2017; Rouse et al., 2020), and child health (e.g., access to a medical home, on-time well child doctor visits, developmental screening) (Aysola et al., 2013; Karoly et al., 2005; Peterson et al., 2018). To address these factors, coordination between home visiting and other sectors are critical, such as health care providers, Early Intervention, early childhood education, Medicaid, child welfare, and housing.

Systems level coordination includes prioritization of relationship building between sectors, a shared vision, and shared accountability to common goals, as well as investments to the necessary infrastructure needed to support coordination, including shared governance, shared data, and aligned and sustainable funding (Johnson et al., 2022; Simmons et al., 2022). One coordination need within Alabama's early childhood system is the need for infrastructure to support data integration. States and territories that receive Maternal, Infant, and Early Childhood Home Visiting (MIECHV) funds are required to create data exchange standards per the Bipartisan Budget Act of 2018, and other federal programs such as child welfare and foster care have the same statutory requirements (Sturmfels et al., 2022). However, progress in this area is slow. The Alabama Department of Early Childhood Education (ADECE) is the lead agency for both the First Class Pre-K (FCPK) program and the First Teacher Home Visiting (FTHV) program, however, there is no data interoperability between the two data collection systems. This makes it more difficult to study program effects and makes data-informed decision making more difficult. State investments in data infrastructure would result in higher quality data, while decreasing the burden on individual programs, improving the

coordination of services for families, and improving capacity to use data for continuous quality improvement (CQI), research and evaluation (Sturmfels et al., 2022).

Equity Focus

Equity is a critical policy and practice consideration. Home visiting services and the policies that support them must focus on equity to be effective. As discussed in Paper 1, school readiness is influenced by many contextual factors beyond individual children and families, including community and societal factors, such as racism (Coba-Rodriguez & Jarrett, 2022; Halfon et al., 2020; Washington et al., 2020; Wolf et al., 2017) and poverty (Murphy et al., 2022; Nix et al., 2018; Paschall et al., 2017; Rouse et al., 2020; Shaw et al., 2021; Smith Adcock et al., 2019). To find solutions that will work for families, we must address these factors. Further, we must examine the structural and systemic historic and ongoing inequities that are the root causes for the disparities we see in educational outcomes, such as school readiness. For example, the effects of segregation, and the continual disinvestment in communities of color, are significant and long-lasting and must be addressed (Coba-Rodriguez & Jarrett, 2022; Halfon et al., 2020; Washington et al., 2020; Wolf et al., 2017).

Directions for Future Research

Future research should employ both quantitative and qualitative research methods. Additional literature reviews and qualitative research are needed to inform the development of a conceptual model of school readiness, additional quantitative methods are needed to study the effects of home visiting on school readiness at different time

points, including primary and secondary school, and additional qualitative research is needed to inform the development of additional CQI tools for use in practice, including a CQI change package.

Conceptual Model

Development of a conceptual model of school readiness is necessary because of the variability of and interrelated domains included in school readiness definitions, and the number of and complex interplay between contextual factors that moderate home visiting's effect of school readiness. The conceptual model should include the dimensions or domains of school readiness as well as the contextual factors that may act upon each domain to promote school readiness. Further, it would be helpful to explore key measurement options for both the domains and factors. There is precedence for this in the field of home visiting. For example, the Office of Planning, Research, and Evaluation (OPRE), the Administration for Children and Families (ACF), and the U.S. Department of Health and Human Services (HHS) funded James Bell Associates (JBA) to create a similar model to support home visitor professional well-being, another complex, multi-faceted topic (Sparr et al., 2022). Creating a conceptual model would involve qualitative data collection from experts in the field, including families and home visitors, to gain consensus on the definition, domains, and contextual factors, as well as additional literature reviews into each domain.

Statistical Analyses

Additional statistical analyses are another next step for this research. In 2020, the Alabama State Department of Education (ALSDE) began administering the Alabama Kindergarten Inventory of Developing Skills (AlaKids) assessment for children entering kindergarten (Alabama Department of Early Childhood Education, n.d.). It would be worthwhile to use the same statistical methods used in Paper 2 to examine school readiness using the AlaKids assessment. In addition, previous research has examined later reading and math performance of children who received Alabama's First Class Pre-K (FCPK) compared to children who did not. That research found that the benefits of FCPK persisted into elementary and middle school (Preskitt et al., 2020). It would be beneficial to use similar statistical methods to examine whether children who received home visiting, alone or in addition to FCPK, perform better on assessments of math or reading performance in later grades. This is especially critical given the 2019 passage of the Alabama Literacy Act which states that children who are not proficient in reading be automatically retained in third grade (Alabama Literacy Act, 2019).

Change Package

A change package is a synthesis of robust and effective change ideas and change tools for improvement (USAID, n.d.). Change ideas are those action-oriented strategies that are believed to result in improvement, and change tools are specific examples or resources to support tests of change. The changes and change ideas are organized by the drivers developed in the KDD (Johnson et al., 2022; Simmons et al., 2022). The change package is the next step after the development of the KDD as it outlines specific actions

that may be taken in the field to produce the desired result, given the theory of change outlined in the KDD (Johnson et al., 2022; Simmons et al., 2022). There is a precedence for change package development in early childhood and home visiting fields nationally (Clark et al., 2020; Johnson et al., 2022; Simmons et al., 2022).

While KDDs have been developed for use in Alabama's home visiting program (Fifolt et al., 2019), this would be the first full change package developed for use. To complete this work, additional engagement of experts in early childhood and home visiting fields, including families and home visitors, would be required to gain insight into potential change ideas and change tools. In addition, change ideas will require iterative, small tests of change in the home visiting field using the Model for Improvement (Langley et al., 2009). The driver diagram and change package will undergo multiple revisions based on what is learned from testing and may be modified to fit local program contexts.

Conclusion

Overall, this work is significant because it informs ADECE in its administration and implementation of the home visiting. ADECE aims for accountability in the administration of state and federal funding, and lessons learned from this research will help to inform early childhood funding priorities and policy decisions at the state level. The national significance of this work is that it will contribute to the evidence base in the home visiting research field, giving national policy makers and funders information on the effectiveness of home visiting. This is critically important as the evidence base associated with MIECHV home visiting is often cited as a main reason for strong,

bipartisan support for and ongoing expansion of services through significant federal and state investments (Center on Budget and Policy Priorities, 2022; Start Early, 2023).

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APPENDIX

UNIVERSITY OF ALABAMA AT BIRMINGHAM INSTITUTIONAL REVIEW BOARD LETTER OF APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 |
irb@uab.edu

Approval Letter

To: Preskitt, Julie K

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)
IORG Registration # IRB00012550 (IRB 03)

DATE: July 1, 2020

RE: IRB-170504002
DECE First Class Pre-K Secondary Data Analyses

The IRB reviewed and approved the Continuing Review submitted on Jun 8 2020 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review:	Expedited
Expedited Catergories:	5,7
Determination:	Approved
Approval Date:	Jun 9 2020
Expiration Date:	Jun 8 2021

The following apply to this project related to informed consent and/or assent:

Waiver of Informed Consent

To access approved documents and/or the stamped consent/assent forms:

1.Open your protocol in IRAP.

2.On the Submissions page, open the submission corresponding to this approval letter. NOTE: The Determination for the submission will be "Approved."

3.In the list of documents, select and download the desired approved documents. The stamped consent/assent form(s) will be listed with a category of Consent/Assent Document (CF, AF, Info Sheet, Phone Script, etc.).