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Perceived Impact of Georgia Home Visiting on Social Emotional Learning in

Children Five Years and Younger

By

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Master of Public Health

Global Epidemiology

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Thesis Chair

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By

Alexandra Whicker

BS, University of North Carolina at Chapel Hill, 2017

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fullfilment of the requirements for the degree of
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Abstract

Background: Social emotional learning (SEL) in early childhood is an important indicator of developmental, academic, and mental health outcomes in adolescence and adulthood. The Georgia Home Visiting Program provides home visiting services to parents of children five years and younger in order for them to raise socially and emotionally healthy children. When the COVID-19 pandemic began in March, 2020 these services were moved online.

Methods: Study participants included 252 clients who were active in home visiting programs in Georgia between November 15, 2019 and February, 18 2022 and completed a brief online survey between November 15, 2021 and February 18, 2022. Thirteen indicators of perceived impact of home visiting on child SEL, rated from one (significantly worsened) to five (significantly improved), were collected and averaged as the primary outcome. A multiple linear regression was used to evaluate the correlation between the outcome and type of home visiting received (in-person, virtual, or both in-person and virtual). Ordinal logistic regression was used to evaluate the relationship between type of home visiting received and each individual indicator of perceived impact of home visiting services on child SEL.

Results: The average rating of percieved impact of home visiting on child SEL was 4.56, indicating a moderate to significant improvement in child SEL. Receiving in-person home visits was correlated with an improvement in average perceived impact of home visiting on child SEL by 0.10 points compared to those who received both in-person and virtual visits and 0.20 points compared with only virtual. Participants were 1.57 and 1.92 times more likely to report a higher improvement in knowledge of activities and resources (respectively) related to child emotional development when they received in-person visits compared to virtual.

Conclusion: Home visiting improves child SEL in children under six, with greater improvement found for in-person home visits. This demonstrates that home visiting is an effective way to improve SEL in early childhood and should be delivered in-person for the greatest impact.

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Table of Contents

Introduction

  Social and emotional learning (SEL) is critical for both children and adults to build healthy relationships, overcome everyday challenges, and ultimately thrive in life. SEL is the process of developing the self-awareness, self-control, and interpersonal skills to control our emotions, set goals, and build relationships with others (Elias et al., 1997). SEL in early childhood is a key predictor of social and emotional outcomes in adolescence and adulthood (Durlak et al., 2011). The majority of SEL-related research to date has primarily focused on school-age children, but there has been increasing focus on the importance of SEL in early childhood through programs such as home visiting.

  The Georgia Home Visiting Program (GHVP) was established to strengthen Georgia's capacity for addressing the overall health, safety, and wellbeing of families and children through the implementation of Evidence-Based Home Visiting (EBHV) services and the enhanced coordination of services for at-risk families. Conditions which typically make families considered at-risk include one or more of the following situations for the primary caregiver: low-income, first-time parent, under 21 years of age, unemployed, unstable housing, low educational attainment, history/current substance abuse, has children with developmental delays or disabilities, among other situations (Georgia Department of Public Health, 2021). Clients are eligible to be enrolled in the program during pregnancy and can remain in the program until the child is five years of age (University of Georgia, 2020, p. 2). The GHVP aims to provide "resources and skills to raise children who are … socially and emotionally healthy," (Georgia Department of Public Health, 2021). Given this aim, understanding how home visiting programs in Georgia impact SEL in early childhood may guide future programming for home visiting activities both in Georgia and nationwide. A 2020 report found after starting home visiting

1

services 96% of clients read, told stories or sang songs to their children and there were almost no reports of child maltreatment. However, no assessment of SEL-specific outcomes were reported (Nelson et al., 2021).

In addition to a general lack of SEL-specific research in home visiting, there is also little known about how virtual home visits impact SEL compared to in-person visits. When the COVID-19 pandemic began in March, 2020 all home visiting in Georgia was switched to an online format, with home visitors and clients communicating via phone calls, video chats, or a combination of the two. While some in-person visits have been made since then, the majority of home visits continued virtually. Understanding how this has impacted child SEL is crucial to making decisions about the format of future home visits.

In this study, we examine the impact of the COVID pandemic in delivering SEL services in home visiting programs that utilize two models, Healthy Families Georgia (HFG) and Parents as Teachers (PAT). These programs are are funded by the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program. The MIECHV program is a federal program that provides funding to states to supports home visiting for families with young children who are at risk for poor maternal and child health outcomes (U.S. Health Resources and Services Administration, 2021). The goals of Georgia Home Visiting programs are: "(1) increase healthy pregnancies; (2) improve parenting confidence and competence; (3) improve child health, development and readiness; and (4) increase family connectedness to community and social support" (University of Georgia, 2020, p. 2).

The goal of this study is to understand how the PAT and HFG programs in Georgia affect child SEL. This study also seeks to determine if the format of these home visits (in-person v.

virtual) impacts the effectiveness of these programs at addressing child SEL during the COVID-19 pandemic.

Review of Literature

The Importance of SEL in Early Childhood

Social emotional learning in early childhood has been linked to social functioning in adolescence and adulthood as well as long-term outcomes such as educational attainment and employment. While past research on SEL in children has focused on later childhood, recent research provides evidence of SEL in early childhood as a predictor of social-emotional development in later life. A prospective cohort study of 20,409 five-year old children in British Columbia, found that decreased social-emotional functioning at the entrance to kindergarten (around five years old) predicted the development of physician-diagnosed mental health conditions between the ages of 6 and 14 (Thomson et al., 2019). Another prospective cohort study of 1,004 ethnically and socioeconomically diverse children in the northeast United States also reported that problems with emotional and social functioning identified at 12 to 36 months of age were associated with poorer teacher-reported SEL in elementary school (Briggs-Gowan and Carter, 2008).

One longitudinal study of 753 students in the United States indicated that teacher-rated prosocial skills of kindergarten students were significantly associated with adult outcomes even after controlling for socioeconomic factors, including future workplace success, likelihood of committing crimes, living in public housing, mental health, high school graduation, and college completion(Jones, et al., 2015). These results suggest that, on the macro scale, failing to address SEL in early childhood may increase the labor and economic burden on the public housing and

criminal justice systems. At the personal level, early childhood SEL may increase an individual's likelihood of greater personal success in academic or career achievements as well as security and stability in housing and income (Jones et al., 2016).

Children born into "high-risk" circumstances, such as economic insecurity, threats to survival, or mental illness often have less developed SEL skills compared to their lower risk counterparts (Schore, 2017). A review of studies provides evidence that stress early in life creates epigenetic changes in the brain during development, causing difficulties with emotional responsiveness and stress-coping abilities later in life, particularly in males (Schore, 2017). In these high-risk situations, research indicates that the most effective strategies to ensure the parent-child relationship remains healthy include building a supportive relationship with the family, connecting them with resources for material needs, and providing developmental guidance (Weatherstone et. Al., 2020). The development of children growing up in poverty can often be hindered, which has been shown to lead to disparities in cognitive development and SEL when entering school (Bierman et al., 2017). Early interventions through home visit programs or preschool can reduce these disparities, especially when paired with evidenced-based programming in elementary school (Bierman et al., 2017).

Interventions for Child SEL

A review of 39 studies on psychosocial interventions to promote early childhood mental health from 2010 to 2019 identified four interventions with strong evidence of effectiveness: behavioral interventions supporting parents of toddlers, interventions which support teenage mothers, tiered interventions which provide different types or levels of familial support based on the family's risk level, and home visit programs that provide parents individualized support

(Kaminski et al., 2022). Each of these interventions focus on supporting the parent by providing the skills and resources for the parent to succeed in raising a healthy child. Many of the studies in this review state the purpose of the home visiting program was to overcome access barriers by bringing the intervention to the patient, but this puts the burden of transportation on the home visitors. The review is also limited in its inclusion of studies where interventions are provided through the medical system. Additionally, the authors note that many people still do not have access to the interventions discussed, so further studies are needed on how to increase the reach of these programs(Kaminski et. Al., 2022).

Home visiting programs are often focused on improving parenting skills and knowledge, which is based on the theory that parent-child relationships are the biggest factor determining child developmental outcomes in high-risk families (Peterson et. Al., 2018). The family is often the first context in which children may experience and express emotions and thus parenting behavior can determine their social and emotional development. Several studies provide evidence that parent behavior and knowledge is correlated with child SEL (Landry et al., 1997; Kårstad et al., 2015). For example, a cohort study in 1997 found a negative association between restrictive styles of parenting and the rate at which children develop social skills. This delay in social skill development appeared to be worse in children diagnosed with one or more severe medical complications (Landry et al., 1997). A 2015 study in Norway also demonstrated that a parent's ability to understand their child's thoughts and feelings, which is considered an indicator of the child's social and psychological functioning, was correlated with the child's growth in emotion understanding from age four to six years (Kårstad et. Al., 2015).

The correlation between parenting behavior and child SEL are consistent in younger children as well (McFarlane et al., 2010; Raikes et al., 2014). A 2010 cohort study reported that

the quality of early parenting was associated with children's social and emotional adaptation to school (McFarlane et al., 2010). In this study, parenting habits and attitudes were observed one year after their child's birth. Results indicated that habits such as lack of hostility, promotion of literacy, and encouragement of developmental advance were associated with decreased teacher-rated shyness, concentration problems, and peer rejection when children reached first grade; even after controlling for child gender, gestational age, parity, poverty, maternal parenting stress, maternal depressive symptoms, maternal substance abuse, interpersonal violence, and substantiated child maltreatment (McFarlane et al., 2010). A 2014 randomized control trial also supports the use these indicators for child social and emotional outcome in a home visiting context. This study reported that changes in parenting behavior when a child is 24 months old were correlated with subsequent child outcomes when they reach 36 months (Raikes et al., 2014).

The Home Visiting Evidence of Effectiveness review is another evaluation of the impact of home visiting. This review specifically examined the ability of home visiting programs to reduce child abuse and neglect and improve child development, which is a goal of many early childhood home visiting programs. Findings from the studies reviewed indicated mixed results, with some research showing favorable outcomes and others showing no effect. Health Families America and Parents as Teachers combined had 20 studies with favorable findings and 124 with no effect (U.S. Department of Health and Human Services, n.d.). While this suggests home visiting programs may help reduce the risk of child maltreatment and decrease disparities in child development, more definitive evidence of program effectiveness is needed. Much of the research that does exist is focused on the Nurse-Family Partnership (NFP) model, a national program administered by a non-profit organization which limits participation to prenatally enrolled, first-

time parents (Wideman et. Al., 2020). A 2018 qualitative study of a MIECHV-funded home visiting program in Florida found that the programs improved parenting skills and provided parental emotional support,which in turn increased engagement with their children (Marshall et al., 2018). A 2019 national program evaluation of MIECHV-funded home visiting programs also found that these programsreduce child behavior problems and reduce psychological aggression towards the child (Michalopoulos et al., 2019).

In addition to the long-term outcomes that have been previously described, interventions promoting SEL in early childhood have also been shown to have immediate positive outcomes on child behavior (Blewitt et al., 2018). A 2018 systematic review of experimental or quasi-experimental studies found that curriculum based SEL interventions for children aged two-six years immediately improved child emotional competence and self-regulation and decreased behavioral and emotional difficulties (Blewitt et al., 2018). Another review of SEL interventions in early childhood education and care settings found similar results (Blewitt et al., 2021). Many studies reviewed reported a decrease in emotional and behavioral problems when interventions were delivered to select children who did not respond to universal support. However, the quality of these studies differed greatly, so caution should be taken when interpreting these results (Blewitt et al., 2021). While the body of research on SEL in early childhood is growing, there is still more needed, particularly in children under five years old. It is difficult to implement wide-reaching SEL interventions outside of educational settings, which explains why this age group is less studied. The research that does exist, however, indicates that this is a critical age for socioemotional development, suggesting the interventions targeted at children under five can have a big impact on their mental and emotional health outcomes.

Impact of COVID-19 on Home Visiting Programs

Prior to the COVID-19 pandemic the majority of home visiting programs conducted visits almost exclusively in-person, despite virtual programs such as telehealth becoming increasingly popular (Shigekawa et al., 2018). Due to this, there is limited research evaluating virtual home visiting. When the pandemic began in March 2020 GHVP switched to a completely virtual format. Currently home visits in Georgia are still primarily being conducted virtually, however, some in-person visits have been arranged on clients' porches to maintain social distancing while conducting in-person services (Blake et al., 2021). Although many U.S. workplaces have now returned to in-person activities, continuing to offer virtual home visits may increase accessibility to those who are geographically isolated or who require more flexibility with scheduling these services.

Limited research on the effect of the pandemic on early childhood interventions has been conducted. One study of a home visiting program in Los Angeles found that while enrollment initially decreased by 50% at the beginning of the pandemic and the number of missed visits increased, the rate of completion remained the same as pre-pandemic numbers (Bock et. Al., 2021). However, this study did not evaluate the effectiveness of the program. A randomized control trial in Kansas City, Kansas, Missouri metropolitan area, and rural and suburban Oregon evaluated the impact of the Play and Learning Strategies (PALS) program, an internet-based parenting intervention for promoting early language, cognitive, and social development. An online attention control program was used as the control group, therefore it is unclear how the virtual format compares to in-person programming. While there was evidence that this program improved maternal language promoting strategies compared to the control group, no

improvement was found in parental knowledge of infant social-emotional behavior (Feil et. Al., 2020).

While little is known about the effects of virtual home visits on child SEL, a study in Georgia found that many of the challenges to virtual visits were related to technological issues, such as unstable internet or limited access to devices, and 83% of clients identified some benefits to virtual visits including less time to complete the visit and ease of scheduling visits. One negative outcome that staff reported, however, was difficulty engaging clients in activities via virtual home visits. Despite these issues with technology and engagement many staff and clients wished to continue virtual visits into the future. In this study clients also reported home visiting to be most helpful for emotional/social support, parenting skills, and child development resources and education. While this study offers great insight into the effects of the pandemic on home visiting, it is not limited to clients with children under five years and does not focus on child SEL. More targeted research is needed on how SEL in children under five years is affected. (Blake et al., 2021)

Providing an effective, virtual home visiting program is even more crucial during the pandemic, which has increased the stress and financial burden of many families. One evaluation of child maltreatment during the pandemic found that 87% of home visitors believed risk for maltreatment increased since the pandemic (Bullinger, 2021). Given many home visiting programs' goal of decreasing child maltreatment, this underscores the importance of continuing to offer home visiting services during the pandemic. In a review article assessing the mental health impact of the pandemic on children and adolescents, social and emotional development of young children was found to be impacted significantly more compared to adults. Children of all age groups were found to have increased clinginess, inattention, and irritability (Singh et. Al.,

2020). Additionally, children from lower income families or marginalized communities were more susceptible to developing negative psychiatric symptoms caused by effects of the pandemic (Ghosh et. Al.,, 2020; Deolmi & Pisani, 2020). Understanding how impactful virtual home visiting is will help ensure that these programs can continue to effectively support families, particularly those who are most vulnerable to the impacts of the pandemic.

<u>Current Evaluation</u>

Prior research has indicated that home visiting programs may be effective as an intervention for SEL in early childhood. However, there is limited research on programs besides NFP, on children under 5 years, and on virtual home visiting. With the sudden increase in virtual home visits, a better understanding is needed of how the impact of virtual home visits differs from in-person ones. This study seeks to fill these gaps in research. **The primary goal of this study is to assess the impact of the HFG and PAT home visiting programs on child SEL in children five years or younger in Georgia. This study also seeks to evaluate how the type of home visit received (in-person v. virtual) has impacted the effectiveness of home visits at addressing child SEL**. This will be accomplished by analyzing the perceived impact of home visiting services on child SEL, as reported by clients, and how this differs by the type of home visits received and various other sociodemographic factors. This study uses skills and knowledge related to parenting and child development as indicators for child SEL, which is supported by significant research indicating a correlation between the two. Examining how SEL in early childhood is influenced by home visiting programs in the state of Georgia may also provide additional insight into how these programs can be improved or expanded upon locally. The use of virtual programming to conduct home visits in the face of the COVID-19 pandemic is likely to

continue into the near future and may be a useful tool long-term to increase accessibility of these services.

Methods

Study Design

This study incorporates both cross-sectional and natural experiment designs. By partnering with the Georgia Department of Public Health (GDPH), clients of the PAT and HFG home visiting programs were contacted and asked to complete a survey in order to evaluate their perceived impact of home visiting services on child SEL. Participants were recruited from 14 different programs around the state of Georgia.

Study Population

Data was collected from clients of MIECHV-funded HFG or PAT programs in Georgia who were participants in the program in November, 2019 or later. These clients were parents or guardians of children enrolled in the program. A total of 1,017 clients were eligible to participate in the study. Of this number, 30%, or 309 clients took the survey and 57 of these survey responses were incomplete and were excluded from the analysis, giving a total of 252 participants included in this study. There were 106 enrolled in the HFG program and 146 in PAT.

Home Visiting Programs

This study examines two different home visiting programs: HFG and PAT. In the HFG model visits are structured around needs identified from a needs assessment survey and this program is more targeted towards higher need families. The program aims to strengthen parent-

child relationships and prevent the abuse and neglect of children. Home visitors meet with their clients once per week. The PAT program is led by parents and is aimed at promoting early childhood development and health by enhancing the knowledge, attitudes, and behaviors of parents and caregivers. In the program home visitors meet with clients once every two weeks (University of Georgia, 2020. These programs are considered "evidenced based," meaning they have been studied and shown to improve the health and wellbeing of children and parents (University of Georgia, 2020, p. 4). The PAT organization reports that it can decrease the likelihood of child maltreatment by 22% and children who participate in PAT demonstrate higher adaptive behaviors, self-control, and language skills (Parents as Teachers, n.d.). Healthy Families America, the national program connected with HFG, reports that it reduces recurrence of child maltreatment by one-third, and reduces the number of children requiring special education services at the end of first grade by 26% (Healthy Families America, n.d.).

Data Sources

This survey collects cross-sectional data by asking participants to report information based on their current status. Data on the overall impact of home visiting on SEL were collected at the same time that data on various exposures were collected. The survey also asks what types of home visiting services (virtual and in-person) the client has received.

Data Collection Instruments

Data were collected through an online survey administered via Qualtrics. This survey was developed by the Emory research team to collect sociodemographic information about the clients and their children as well as assess the clients' perception of the impact home visiting services had on their child's SEL. All data were self-reported. The survey was available in both Spanish

and English, although a number of participants who took the survey in English noted that Spanish was their primary language. The survey included 68 items on the client's demographics, their child's demographics, their experience with the home visiting program, the impact of the home visiting program on child SEL, household information, and the SEL services they received. Demographics questions were largely based on questions used in the Ages and Stages Questionnaire. Questions regarding clients' experience with the home visit program and its impact were based on the HOVRS-A+ questionnaire or were developed by the research team and informed by the literature. For survey responses that appeared improbable or inconsistent with the GDPH records, participants were contacted to verify their responses or their responses were corrected based on GDPH records. Duplicate or incomplete survey responses were removed from the dataset.

Study Measures

Outcome: Perceived Impact of Home Visiting Services

Participants were asked to rate, on a scale from one to five, with one being significantly worsened and five being significantly improved, how they percieved 13 indicators related to SEL were impacted by the home visiting program. For the primary outcome the ratings of these 13 indicators were averaged. The ratings of individual indicators were also analyzed. The 13 indicators are listed in Appendix A.

Primary Exposure: Type of Home Visiting Services Received

The main exposure in this study is the type of home visiting services received: only in-person visits, only virtual visits, or both virtual and in-person visits. This variable was treated as an ordinal variable and coded as one for only in-person visits, two for both in-person and virtual,

and three for virtual only visits. Of the clients participating in the study, 8.7% report receiving only in-person visits, 52.4% report receiving only virtual visits, and 38.9% have received both. Participants who report receiving both in-person and virtual home visits are defined as "combined" in the results. Due to the COVID-19 pandemic, home visiting services were switched to an online format in March, 2020. This exposure was thus determined by the dates in which the client participated in the program, creating a natural experiment design. Participants who graduated from the program prior to March, 2020 received only in-person home visits, most participants who began the program after this date received only virtual visits, and those who started the program before March, 2020 but are still participating or graduated after this date received both in-person and virtual home visits.

Covariates

Several variables were examined as covariates with the perceived impact of home visiting on child SEL: program, participant race/ethnicity, number of children living with participant, county of residence, participant's insurance status, length of time in program, survey language, participant's first language, child gender, and gestational age. In examining the relationship between type of home visit and perceived impact of home visiting on child SEL the following variables were considered as covariates: child gender, participant race/ethnicity, length of time in the program, child age, participant insurance status, gestational age, marital status, participant age, number of children living with the participant, and the program type. Program type was coded as a nominal variable, divided into two categories: HFG and PAT. PAT was the reference group. Five race and ethnicity categories were included: White, Black/African American, Hispanic/Latino, Asian, and other, which included participants who selected "other" as their race on the survey. These were coded as indicator variables with Asian as the reference category. The

14

number of children the participant had was coded as a nominal variable, with one representing the participant having one child living with them and two representing the participant having two or more children. Having one child was the reference group. County of residence was coded from 1 to 20, representing the following counties, respectively: Bartow, Bleckley, Chattahoochee, Clarke, Dekalb, Dooly, Glynn, Gwinnett, Houston, Jackson, Macon, Madison, McIntosh, Muscogee, Oglethorpe, Peach, Richmond, Rockdale, and Whitfield. Length of time in the program was treated as an ordinal variable and separated into five categories: less than six months, six months to less than one year, one to two years, two to three years, and three or more years. Their insurance status was coded as indicator variables, including the categories: Medicaid, military/Tricare or private insurance, or no insurance, with no insurance as the reference category. Marital status was divided into two categories: married/partnered or single, with married/partnered being the reference group. Participant age was divided into two categories: participants who were under 20 years at the child's birth and participants who were not. The former was the reference group. Child gender was categorized as male or female with male being the reference group. Gestational age was coded as a nominal variable and divided into two categories: 36 weeks or younger and 37 weeks or older. The former was the reference group. Child age was treated as a continuous variable measured in years.

Statistical Analysis

Statistical analyses were conducted using SAS v9.4. One-way analysis of variance was used to determine how the average impact of home visiting differed by the following variables: program, participant race/ethnicity, number of children living with participant, county, participant's insurance status, length of time in the program, child gender, and child's gestational age at birth. T-tests using Tukey's method were used to identify statistical differences in the

15

different levels of each variable while holding the alpha level at 0.05 regardless of the number of

levels the variable had. Each level of every variable was compared to every other level of that

variable to test for statistical differences. For example, the average perceived impact of home

visiting on child SEL in each county was compared to that of every other county, generating 19

p-values each for the 20 counties included in the study. A multiple linear regression model was

used to analyze the relationship between type of home visit and the average perceived impact of

home visiting on child SEL. The covariates discussed above—child gender, participant

race/ethnicity, length of time in the program, participant insurance status, gestational age, marital

status, participant age, number of children living with participant, and the program type—were

all considered as confounding or interaction terms. F-tests were used to determine statistical

significance. Collinearity of predictors in this model were assessed using variance inflation

factors (VIF); VIF values over 10 indicated collinearity. Ordinal logistic regression was used to

analyze the relationship between type of home visit received and individual indicators of the

perceived impact of home visiting on child SEL, with Wald chi square tests to determine

statistical significance of the odds ratios. The same covariates considered for the multiple linear

regression were also considered for the ordinal logistic regression, with the exception of length

of time in the program, which was replaced by child age. Collinearity of predictors in this model

were assessed using condition indices (CI) and variance decomposition proportions (VDP); CI

values greater than 30 as well as two or more VDPs greater than 0.5 indicated collinearity. An

alpha level of 0.05 was used for all statistical tests in this study.

Results

Participant Demographics

Of the total 252 participants, slightly more than half (52%) received home visits in a virtual format only, 39% received both in-person and virtual home visits, and 9% received only in-person visits (Table 1). Children of participants were relatively evenly split between male and female. More participants in the HFG program (58%) completed the survey compared to PAT. The majority of participants identified as Black/African American (46%), one third identified as Hispanic/Latinx (29%), and fewer identified as White (14%) or Asian (6%). Over half of all participants (59%) are insured through Medicaid, while 20% are uninsured and 20% are privately insured or have military insurance. Survey responses completed in Spanish made up 13% of all responses, however 18% of participants stated Spanish was their first language and 7% reported a first language other than English or Spanish.

Table 1: Characteristics and Demographics of Clients from MIECHV-Funded HFG and PAT Home Visiting Programs in Georgia from November, 2019-February, 2022, n=252

Variable	No.	Percent (%)
Participant Demographics		
Home visit type		
Virtual only	132	52.4
Combined	98	38.9
In-person only	22	8.7
Program		
HFG	106	42.1
PAT	146	57.9
Race/ethnicity		
Asian	15	6.0
Black/African American	116	46.0
Hispanic/Latinx	72	28.6
Other/mixed race	14	5.6
White	35	13.9
Length of time in program		
Less than 6 months	26	10.3
6 months to less than 1 year	42	16.7
1 year to less than 2 years	69	27.4
2 years to less than 3 years	50	19.8
3 or more years	65	25.8
Insurance status		
Medicaid	150	59.5
No insurance/self pay	51	20.2
Private or military insurance	51	20.2
Education		
Less than high school	44	17.5
High school diploma or GED	86	34.1
Some college or post-secondary training	68	27.0
College	42	16.7
Graduate or professional school	12	4.8
Age		
<20 years at child's birth	16	6.4
20+ years at child's birth	236	93.7
Employment status		
Employed full-time	79	31.4
Employed part-time	54	31.4
Unemployed	112	44.4
Disabled or retired	7	2.8
Housing status		
Owns their own home	71	28.2
Renting or living with Family	160	63.5

Public housing or other	21	8.3
Marital status		
Married or partnered	153	52.8
Unmarried	119	47.2
Survey language		
English	218	86.5
Spanish	34	13.5
First language		
English	188	74.6
Spanish	45	17.9
Other	19	7.5
Index Child Characteristics		
Gestational age at birth		
<37 weeks	31	12.3
37+ weeks	221	87.7
Age (mean)	3.6 (SD=1.5)	
Gender		
Female	131	52.0
Male	121	48.0
Special needs		
Child has special needs	15	5.2
Child does not have special needs	239	94.8

Abbreviations: SD, standard deviation

Predictors of Average Perceived Impact of Home Visiting Services on Child SEL

The overall average rating of perceived impact of home visiting services for all participants was 4.55 (Table 2), indicating that on average participants reported moderate to significant improvements in child SEL. Statistical differences were found between the two programs (p=0.0144), with HFG participants reporting an average of 4.61 and PAT an average of 4.45. Participants of all races reported average improvement in child SEL. However, Asian participants had significantly lower average ratings (3.95) than White (4.51, p=0.0036), Black/African American (4.61, p<0.001), Hispanic/Latinx (4.53, p=0.0006), or other/multi-race participants (4.77, p=0.0001). By county, participants from Dekalb had a significantly lower average rating (4.09) than Houston (4.68, p=0.0060), Muscogee (4.68, p=0.0074), and Whitfield (4.71, p=0.0058). Participants whose primary language was neither English nor Spanish also

reported a significantly lower rating (4.20) than English speakers (4.59). No significant

differences were found between male and female children, premature and mature children,

participants with one child and those with multiple children, or between participants who have

been in the program for different lengths of time.

Table 2: Average Rating of Perceived Impact of Home Visiting on Child SEL by Clients of
MIECHV-Funded PAT and HFG Home Visiting Programs in Georgia, n=252

Variable	Sample Size	Average Rating (1-5)
Overall Average Rating	252	4.56
Participant		
Program*		
HFG	146	4.61
PAT	106	4.45
Race/ethnicity		
Asian*	15	3.95
Black/African American	116	4.61
Hispanic/Latino	72	4.53
Other or multi-race	14	4.77
White	35	4.51
Number of children		
1	69	4.47
2+	183	4.57
County		
Bartow	9	4.56
Bleckley	1	3.77
Chattahoochee	3	3.62
Clarke	17	4.34
Crisp	14	4.70
Dekalb*	19	4.09
Dooly	2	4.08
Glynn	10	4.67
Gwinnett	1	5.00
Houston	37	4.68
Jackson	6	4.42
Macon	1	5.00
Madison	2	4.62
McIntosh	2	4.42
Murray	3	4.97
Muscogee	34	4.68
Oconee	1	4.92
Oglethorpe	1	5.00

Peach	2	3.81
Richmond	20	4.58
Rockdale	38	4.48
Whitfield	29	4.71
Insurance status		
Medicaid	150	4.62
No insurance/self pay	51	4.45
Private or military	51	4.43
Time in program		
<6 months	26	4.58
6 months-1 year	42	4.48
1 year- 2 years	69	4.54
2 years-3 years	50	4.54
3+ years	65	4.58
Survey language		
English	218	4.56
Spanish	34	4.48
First language		
English*	188	4.59
Spanish	45	4.52
Other*	19	4.20
Index Child		
Gender		
Female	131	4.54
Male	121	4.55
Gestational age at birth		
<37 weeks	31	4.50
37+ weeks	221	4.55

*Indicates the value is statistically significantly different (p<0.05) from one or more other levels of that variable. Multiple P-values were generated for each level (one less than the number of levels of that variable), so a variable may have a statistical difference between some levels but not others.

Association Between Type of Home Visit Received and Average Perceived Impact of Home Visiting Services on Child SEL

Linear Regression

A crude simple linear regression model was run with type of home visiting versus

average perceived impact of home visiting services on child SEL. This model was not found to

be statistically significant. In the initial adjusted model all covariates and possible interaction

terms were run (Appendix B). When no interaction was found, interaction terms were removed

and the model was rerun (Appendix C). All non-significant covariates were then removed from the model. Only insurance status and race/ethnicity were kept in the model. All variance inflation factors were less than 10, indicating no collinearity between predictors in the model. The correlation between type of home visiting and average rating of perceived impact of home visiting on child SEL was weak but statistically significant (adjusted R-squared=0.11) (Table 3). The predictor for type of home visit in this model was statistically significant (p=0.0383). The average rating for perceived impact of home visiting on child SEL for those who received combined home visits was an average of 0.10 points higher than for those who received virtual only, when controlling for participant insurance status and race/ethnicity. Those who received in-person only visits had an average rating 0.10 points higher than those who had combined types and 0.20 points higher than those who received virtual only, when controlling for participant insurance status and race/ethnicity. This means those who received in-person only visits perceived a slightly higher impact of home visits on child SEL. Additionally, participants who had Medicaid reported an average perceived impact of home visiting on child SEL rating 0.22 points higher than those with no insurance, when controlling for race and type of home visit received. When controlling for insurance status and type of home visit received, participants of all races reported higher average perceived impact of home visiting on child SEL ratings than Asian participants, with Black/African American reporting 0.5881 points higher, Hispanic/Latinx reporting 0.65 points higher, white reporting 0.56 points higher and participants of other races or multiple races reporting 0.85 points higher. This indicates that Asian participants reported significantly less favorable impacts of home visiting on child SEL compared to other races.

Table 3: Linear Regression Model Summary: Association Between Type of Home Visit and Average Rating of Perceived Impact of Home Visiting on Child SEL Among Clients of MIECHV-Funded PAT and HFG Home Visiting Programs in Georgia, n=252

Variable	Beta	P-Value	Variance Inflation Factor
Crude Model			
Intercept	4.44	<0.0001	0.00
Type of home visit	0.09	0.0623	1.00
Adjusted Model			
Intercept	3.88	<0.0001	0.00
Type of home visit*	0.10	**0.0383**	1.06
Participant insurance Status (Ref. No Insurance)			
Medicaid*	0.22	**0.0208**	2.20
Private or military	0.04	0.6694	1.75
Participant race (Ref. Asian)			
Black/African American*	0.59	**<0.0001**	4.85
Hispanic/Latinx*	0.65	**<0.0001**	4.34
Other race or multi-race*	0.85	**<0.0001**	1.86
White*	0.56	**0.0003**	2.86
Adjusted R-Squared		0.11	

Abbreviations: Ref, reference group
Bold P-value indicates parameter is statistically significant

Ordinal Logistic Regression

In the ordinal logistic regression, a chunk test found that there was no statistically significant interaction between any covariates and type of home visit for any individual indicator(Appendix D). A confounding assessment was conducted for each individual indicator, and confounding was found to be present (Appendix E), with most crude odds ratios (ORs) more than 10% different from the fully adjusted model (gold standard). When only participant's insurance status, participant's race, and child age were left in the model confounding was not found by other variables, so models with varying combinations of these variables were tested (Appendix E). Participant insurance status, participant race, and child age were all found to be associated with both the exposure and outcome for several indicators and so were kept in the

model as confounders to control for any spurious associations. Nine indicators did not meet the proportional odds assumption (Appendix F), so their odds ratios (ORs) are not reported. Only indicators 3 and 11 were found to have statistically significant odds ratios (Table 4). Participants who received in-person only home visits or both in-person and virtual home visits were 1.57 times more likely to report perceived improvement in the knowledge of activities related to their child's emotional development. Participants who received in-person only home visits or both in-person and virtual home visits were 1.92 times more likely to report perceived improvement in the knowledge of resources related to their child's emotional development.

Table 4: Odds Ratios from Ordinal Logistic Regression for Association of Type of Home Visit Received with Average Rating of Perceived Impact of Home Visiting Services on Child SEL Among Clients of MIECHV-Funded PAT and HFG Home Visiting Programs in Georgia, n=252

Outcome	OR (95% CI)
Knowledge of activities to improve child emotional development(Indicator 3)	1.57 **(1.01-2.44)**
Child's ability to self-regulate emotions and behaviors (Indicator 6)	1.48 (0.98-2.22)
Knowledge of resources to improve child emotional development (Indicator 11)	1.92 **(1.20-3.08)**
Willingness to engage in discussion about child's social development (Indicator 12)	1.48 (0.94-2.33)

Abbreviation: OR, odds ratio; CI, confidence interval
Bold CIs indicate statistically significant odds ratio

Discussion

Our study found that, across 13 indicators of child SEL, home visiting creates an overall moderate to significant improvement in child SEL, which complements existing literature. We also found that home visiting more effectively improves child SEL when delivered in-person compared to virtually while controlling for race and participant insurance status, although this difference is small. In particular, it was found that imparting knowledge of activities and resources related to child emotional development is more effective in-person than virtually.

Limited research on the impact of virtual home visiting exists, so these results provide new information for decision-making regarding the format in which home visiting services should be offered. The slight increase in effectiveness using in-person visits should be weighed against the risks of COVID-19 transmission. This study also found that Asian clients are more likely to report less improvement in child SEL compared to any other race. It should be noted that all Asian participants were from Dekalb county, which had a lower average rating compared to several other counties. The majority of respondents from Dekalb county were Asian so it is unclear from our results whether these differences are a result of race or location.

The results of this study indicate that home visiting has a positive impact on early childhood SEL. This is in line with several other studies which report that home visiting has a favorable impact on cognitive development and problem behaviors (Peacock et al., 2013) and can promote gains in academic performance and social emotional adjustment (Bierman et al., 2018). Unlike several recent studies which suggest no difference between in-person and virtual interventions (Bock et al., 2021; Feil et al., 2020), our results show that in-person home visits may have more impact than virtual ones.

There are at least three strengths of this study. First, the survey used to collect data was created for the purposes of this study which ensured that all of the information collected addressed our research questions. Second, the participant population was relatively diverse, ensuring a broad array of perspectives were represented. Finally, the survey was offered in Spanish, ensuring language was not a barrier to participation for Spanish-speaking clients, which comprises a significant portion of the GHVP client population.

Despite these strengths, there are at least X limitations. First, data was self-reported, so recall bias may have an effect on the accuracy of the data collected. Second, the outcome used was perceived impact of home visiting on child SEL, which may not exactly correlate to the actual impact of the programs. Third, social desirability bias may have also caused participants to rate the impact of home visiting more favorably. However, because survey responses were anonymous and confidential, we anticipate that they will accurately reflect the impact on child SEL. Finally, there were a relatively small percentage of the total eligible clients that participated in the survey. While the survey was distributed to all clients, and was made available in Spanish, participation was completely voluntary. This may have created a selection bias towards clients who have stronger opinions on the program. We attempted to minimize this by offering a small financial compensation for survey completion and sending several reminders to take the survey.Moving forward, more research is needed on the how the impact of in-person and virtual home visiting differ. This will be critical in making decisions about what format to offer these services in. Future research should aim to directly measure SEL rather than use self-report data, in order to avoid potential bias. More longitudinal or experimental research would also provide stronger evidence of a causal relationship between home visiting and SEL. Additionally, the survey used in this study includes data about program experience and satisfaction as well as qualitative data. These responses should be analyzed to gain an understanding of the impact of home visiting in Georgia beyond social emotional learning. More research is also needed on how the impact of home visiting differs by race, as the results from this study are ambiguous and do not offer an explanation for why Asian participants report lower perceived impact on child SEL.

The findings from this study have relevant public health implications. These results may help guide decision making about program activities and modalities. The differences in impact

on child SEL by the mode in which home visiting is delivered suggest that, when safe and appropriate, in-person home visits may be preferable in Georgia. Given the current limited research on the impact of virtual home visiting nationally, this study could also serve as a guide for recommendations on home visiting programs across the country as well as a stepping stone for future research. The findings of this study will also support legislative efforts to increase funding for home visiting in Georgia as well as infant and child mental health programs. This can increase availability of these programs to more families in need of these services, which may in turn increase child health and learning outcomes, including SEL. Many interventions targeted at SEL are often implemented starting in pre-school or later. This may be due to difficulties in universally reaching children younger than pre-school age to provide these services. The indication of a moderate to significant improvement in early childhood SEL by home visiting clients suggests that home visiting is an effective way to address SEL in this age group. Starting SEL interventions earlier is likely to help close the gap in academic achievement and behavioral problems between higher and lower income children.

Conclusion

Our study reported on the perceived impact of home visiting on child SEL in Georgia. Our findings of improvement in child SEL due to home visiting suggest that home visiting is an effective tool at addressing SEL in early childhood. Increasing the availability of these services may be an effective approach to improving SEL outcomes in children before preschool en masse. The greater impact of home visiting in-person, compared to virtually, may suggest there is an aspect of in-person visits that is necessary for child SEL which cannot be replicated online.These results can be used by home visiting site supervisors to made decisions about what mode to offer

home visiting services in, as well as by legislators to advocate for increased funding for home

visiting services as a means to improve child mental and emotional health outcomes. .

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Appendix A: Perceived Impact of Home Visiting Services on Child SEL Indicators

Please rate how you have perceived the following to have been affected by the home visiting program on a scale from 1 to 5, with 1 being significantly worsened and 5 being significantly improved:

Your understanding of concepts related to your child's social and emotional development (e.g., secure attachments, parental empathy, brain science)

Your knowledge of activities to improve your child's social development

Your knowledge of activities to improve your child's emotional development

Your parental empathy

Your parenting skills

Your child's ability to self-regulate emotions and behaviors

Your positive interactions with your child

Your ability to help your child solve problems

Your ability to help your child learn new things

Your knowledge of resources to improve your child's social development

Your knowledge of resources to improve you child's emotional development

Your willingness to engage in discussion or activities related to your child's social development

Your willingness to engage in discussion or activities related to your child's emotional development

Appendix B: Linear Regression Model Summary: Association Between Type of Home Visit and Average Rating of Perceived Impact of Home Visiting on Child SEL Among Clients of MIECHV-Funded PAT and HFG Home Visiting Programs in Georgia With All Possible Covariates Included in the Model

Variable	Beta	P-Value	Variance Inflation Factor
Crude Model			
Intercept	4.44	<0.0001	0.00
Type of home visit	0.09	0.0623	1.00
Adjusted Model			
Intercept	2.65	0.0152	0
Type of home visit	0.55	0.3900	178.50
Participant insurance status (Ref. No Insurance)			
Medicaid	0.38	0.1495	17.49
Private or Military	0.37	0.1898	13.46
Participant race (Ref. Asian)			
Black/African American	0.55	0.1345	34.38
Hispanic/Latinx	0.34	0.3398	26.41
Other Race or Multi-Race	0.69	0.1813	14.45
White	0.67	0.0982	19.91
Number of children (Ref. 1)	-0.01	0.9684	9.06
Participant age (Ref. <20 at child's birth)	0.32	0.4398	10.61
Marital status (Ref. Married or Partnered)	-0.19	0.3515	10.78
Program (Ref. PAT)	0.41	**0.0452**	10.30
Time inpProgram (Ref. 3+ years)			
<6 months	-0.05	0.8792	9.08
6 months-<1 year	0.01	0.9815	11.71
1 year-<2 years	0.06	0.8270	13.28
2 years-<3 years	-0.27	0.3737	15.42
Gestational age at birth (Ref. <37 weeks)	-0.03	0.9199	10.23
Child gender (Ref. Male)	-0.02	0.9235	8.42
Type of Home Visit*Medicaid	-0.10	0.5562	24.68
Type of Home Visit*Private or Military Insurance	-0.20	0.2487	14.33
Type of Home Visit*Black/African American	0.01	0.9720	43.79
Type of Home Visit*Hispanic/Latinx	0.17	0.4356	24.33
Type of Home Visit*Other or Multi-Race	0.09	0.8024	13.45
Type of Home Visit*White	-0.09	0.7269	19.92
Type of Home Visit*Number of Children	0.08	0.5116	29.37
Type of Home Visit*Participant Age	-0.22	0.3954	125.99
Type of Home Visit*Marital Status	0.12	0.3145	27.41
Type of Home Visit*Program	-0.17	0.1496	26.49

Type of Home Visit*<6 months	-0.07	0.7032	8.12
Type of Home Visit*6 months-<1 year	-0.11	0.5290	9.94
Type of Home Visit*1 year-<2 years	-0.09	0.5288	13.35
Type of Home Visit*2 years-<3 years	0.16	0.3661	14.79
Type of Home Visit*Gestational Age	0.05	0.8132	72.20
Type of Home Visit*Child Gender	0.00	0.9721	16.87
Adjusted R-Squared			0.10

Abbreviations: Ref, reference group

Bold P-values indicate the parameter is statistically significantly differentfrom one or more other levels of that variable

Appendix C: Linear Regression Model Summary: Association Between Type of Home Visit and Average Rating of Perceived Impact of Home Visiting on Child SEL Among Clients of MIECHV-Funded PAT and HFG Home Visiting Programs in Georgia With All Possible Covariates Included in the Model With All Possible Confounding Variables Included

Variable	Beta	P-Value	Variance Inflation Factor
Crude Model			
Intercept	4.44	<0.0001	0.00
Type of home visit	0.09	0.0623	1.00
Adjusted Model			
Intercept	3.46	<0.0001	0
Type of home visit	0.08	0.1298	1.14
Participant insurance status (Ref. No Insurance)			
Medicaid	0.23	**0.0177**	2.31
Private or military	0.07	0.5174	1.84
Participant race (Ref. Asian)			
Black/African American	0.59	**0.0001**	5.78
Hispanic/Latinx	0.62	**<0.0001**	4.78
Other race or multi-race	0.85	**<0.0001**	2.01
White	0.55	**0.0007**	3.19
Number of children (Ref. 1)	0.11	0.1509	1.15
Participant age (Ref. <20 years at child's birth)	-0.02	0.9026	1.06
Marital status (Ref. married or partnered)	-0.01	0.8777	1.38
Program (Ref. PAT)	0.11	0.1144	1.29
Time in program (Ref. 3+ years)			
<6 months	-0.15	0.23	1.49
6 months-<1 year	-0.16	0.1366	1.57
1 year-<2 years	-0.10	0.2471	1.65
2 years-<3 years	-0.03	0.73	1.55
Gestational age at birth (Ref. <37 weeks)	0.03	0.7783	1.05
Child gender (Ref. Male)	0.00	0.9537	1.12
Adjusted R-Squared			0.11

Abbreviations: Ref, reference group
Bold P-valuesIndicate the value is statistically significantly different (p<0.05) from one or more other levels of that variable

Appendix D: Ordinal Logistic Regression: Chunk Test For All Possible Interaction Terms Conducted for Each Individual Indicator of Perceived Impact of Home Visiting on Child SEL In Association With Type of Home Visit Received

Indicator	P-Value
Understanding of concepts related to child social and emotional development (Indicator1)	0.4370
Knowledge of activities to improve child social development (Indicator 2)	0.4370
Knowledge of activities to improve child emotional development (Indicator 3)	0.4985
Parental empathy (Indicator 4)	0.3946
Parenting skills (Indicator 5)	0.3117
Child's ability to self-regulate emotions and behaviors (Indicator 6)	0.4506
Positive interactions with child (Indicator 7)	0.4761
Ability to help child solve problems (Indicator 8)	0.5653
Ability to help child learn new things (Indicator 9)	0.7592
Knowledge of resources to improve child social development (Indicator10)	0.2201
Knowledge of resources to improve child emotional development (Indicator11)	0.2471
Willingness to engage in discussion about child's social development (Indicator 12)	0.5270
Willingness to engage in discussion about child's emotional development (Indicator 13)	0.6491

Appendix E: Ordinal Logistic Regression: Confounding Assessment of the Association Between Individual Indicators of Perceived Impact of Home Visiting on Child SEL and Type of Home Visit Received

Indicator	Crude OR	Child Age, Race and insurance status included in model OR	Child Age and Race included in model OR	Child Age and insurance status included in model OR	Insurance status and race included in model OR	Child Age only OR	Race only OR	Insurance status only OR	Gold Standard OR
1	1.11*	1.28	1.27	1.25	1.18	1.28	1.15*	1.11*	1.26
2	1.15	1.26	1.25	1.20	1.23	1.25	1.19	1.13	1.21
3	1.43	1.57	1.55	1.57	1.49	1.60	1.44	1.44	1.55
4	1.42	1.50	1.47	1.57	1.42	1.59	1.36*	1.42	1.51
5	1.16	1.20	1.18	1.24	1.17	1.25	1.13	1.17	1.19
6	1.39	1.48	1.41	1.43	1.48	1.45	1.38	1.40	1.45
7	1.21*	1.36	1.32	1.29	1.32	1.31	1.25	1.22*	1.36
8	1.39	1.41	1.36	1.38	1.48	1.41	1.39	1.39	1.41
9	1.27	1.30	1.29	1.28	1.37	1.31	1.31	1.28	1.30
10	1.44*	1.76	1.67	1.53*	1.71	1.55*	1.59*	1.44*	1.75
11	1.49*	1.92	1.78	1.71*	1.76	1.71*	1.60*	1.50*	1.89
12	1.34*	1.48	1.41	1.41	1.46	1.43	1.37	1.33*	1.50
13	1.22	1.29	1.24	1.25	1.32	1.27	1.24	1.22	1.30

Abbreviations: OR, odds ratio

*Indicates the OR is greater than 10% different from the Gold Standard OR, meaning that there is confounding by one or more of the missing variables

Abbreviations: OR, odds ratio

Appendix F: Ordinal Logistic Regression: Score Test to Test the Proportional Odds Assumption for the Relationship Between Each Individual Indicator of Perceived Impact of Home Visiting on Child SEL and Type of Home Visit Received

Indicator	P-Value of Score Test
Understanding of concepts related to child social and emotional development (Indicator1)	<0.0001
Knowledge of activities to improve child social development (Indicator 2)	<0.0001
Knowledge of activities to improve child emotional development (Indicator 3)*	**0.3155**
Parental empathy (Indicator 4)	<0.0001
Parenting skills (Indicator 5)	<0.0001
Child's ability to self-regulate emotions and behaviors (Indicator 6)*	**0.3709**
Positive interactions with child (Indicator 7)	<0.0001
Ability to help child solve problems (Indicator 8)	<0.0001
Ability to help child learn new things (Indicator 9)	<0.0001
Knowledge of resources to improve child social development (Indicator10)	<0.0001
Knowledge of resources to improve child emotional development (Indicator 11)*	**0.2928**
Willingness to engage in discussion about child's social development (Indicator12)*	**0.2615**
Willingness to engage in discussion about child's emotional development (Indicator 13)	<0.0001

Bold P-values of the score test indicates the P-value is above 0.05 and the proportional odds assumption is met