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Infant Mental Health Home Visiting Mitigates Impact of Maternal Adverse Childhood Experiences on Toddler Language Competence: A Randomized Controlled Trial

Jessica L. Riggs, PhD,* Katherine L. Rosenblum, PhD,*† Maria Muzik, MD,*† Jennifer Jester, PhD,* Sarah Freeman, MPH,* Alissa Huth-Bocks, PhD,‡ Rachel Waddell, MSW,* Emily Alfafara, BA,* Alison Miller, PhD,§ Jamie Lawler, PhD,|| Nora Erickson, PhD,¶ Debbie Weatherston, PhD,** Prachi Shah, MD,†† Holly Brophy-Herb, PhD,‡‡; the Michigan Collaborative for Infant Mental Health Research¹

ABSTRACT: *Objective:* The goal of this study was to test the impact of maternal adverse childhood experiences (ACEs) on subsequent child language competence; higher parental ACEs were expected to predict risk of toddler language delay. Participation in Infant Mental Health Home Visiting (IMH-HV) treatment, which aims to enhance responsive caregiving and improve child social-emotional development, was expected to mitigate this association. *Methods:* A randomized controlled trial (RCT) design was used. ACEs data were collected at baseline. Child language screening (using the Preschool Language Scales Screening Test) was conducted 12 months later by masters-level evaluators who were blind to treatment condition. Visits occurred in participants' homes. Participants were community-recruited and were randomized to treatment (psychotherapeutic IMH-HV) or control (treatment as usual). Data come from 62 families who participated in all waves of an RCT testing the efficacy of IMH-HV; mothers were eligible based on child age (<24 mo at enrollment) and endorsement of ≥2 sociodemographic eligibility criteria (economic disadvantage, depression, perceived parenting challenges, and/or high ACEs). *Results:* The age of mothers enrolled in this ranged from 19 to 44 years (M = 31.91; SD = 5.68); child age at baseline ranged from prenatal to 26 months (M = 12.06; SD = 6.62). The maternal ACE score predicted child language competence ($t(5,55) = -3.27, p = 0.002$). This effect was moderated by treatment ($t(6,54) = 1.73, p = 0.04$), indicating no association between maternal ACEs and child language for those randomized to IMH-HV. *Conclusion:* The results highlight that the effects of parent ACEs on early childhood outcomes may be buffered by participation in psychotherapeutic home visiting (trial registration: NCT03175796).

(*J Dev Behav Pediatr* 43:e227–e236, 2022) **Index terms:** Infant mental health, toddler, language, adverse childhood experiences.

From the *Department of Psychiatry, Michigan Medicine, Ann Arbor, MI; †Department of Obstetrics & Gynecology, Michigan Medicine, Ann Arbor, MI; ‡Department of Pediatrics, Rainbow Babies and Children's Hospital, University Hospitals Cleveland Medical Center, Cleveland, OH; §School of Public Health, University of Michigan, Ann Arbor, MI; ||Department of Psychology, Eastern Michigan University, Ypsilanti, MI; ¶Department of Psychiatry, University of Minnesota, Minneapolis, MN; **Alliance for the Advancement of Infant Mental Health, Southgate, MI; ††Department of Pediatrics, Michigan Medicine, Ann Arbor, MI; ‡‡Department of Family Studies, Michigan State University, MI.

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¹The Michigan Collaborative for Infant Mental Health Research (MCIMHR) comprises faculty researchers from 8 universities and from the Alliance for the Advancement of Infant Mental Health, each of whom have collaborated in the design and implementation of the current study. MCIMHR members include (in alphabetical order) Holly Brophy-Herb, Hiram Fitzgerald, Alissa Huth-Bocks, Jennifer Jester, Megan Julian, Jamie Lawler, Alyssa Meuwissen, Maria Muzik, Larissa Niec, Julie Ribaud, Katherine L. Rosenblum, Sarah Shea, Paul Spicer, Ann Stacks, Laurie Van Egeren, Christopher Watson, and Deborah Weatherston.

Address for reprints: Katherine L. Rosenblum, Department of Psychiatry, Michigan Medicine, 4250 Plymouth Rd, Ann Arbor, MI 48109; e-mail: katier@med.umich.edu.

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Early childhood adversity, including experiences of abuse, neglect, parental mental illness or incarceration, and parental divorce, increases risk for poor physical, social, and emotional outcomes in later life.¹⁻³ Previous work has identified a number of potential pathways through which adversity may affect subsequent outcomes. For example, adverse childhood experiences (ACEs)¹ may impair early learning and academic achievement, thus negatively affecting later socioeconomic domains²; may alter stress response systems and subsequent physical and psychological health^{2,4,5}; and may impair relationships that might otherwise serve as buffers against social stressors.⁶ Early evaluations of ACEs have found that approximately 20% of adults have ACE scores ≥3, which represents a substantial subset of individuals who may be at increased risk, given experiences of early adversity. Recent studies have also underscored the protective role played by positive early experiences⁷ and highlight the potential benefit of early interventions to strengthen malleable protective factors, including early relationships.⁸

This study examines the association of parent ACEs on toddler language competence, a growing area of research,^{9,10} to test the potential moderating impact of a psychotherapeutic home-based infant mental health intervention.

Adversity, Parenting, and Child Language Development

Children whose parents experienced childhood adversity are more likely to exhibit internalizing and externalizing problems across childhood.¹¹ Parental adversity may reduce parenting capacity, as evidenced by higher rates of parental behavioral avoidance, withdrawal, hostility, and intrusiveness in parent-child interactions; higher levels of parenting stress; and perceptions of the child as difficult.^{12,13} Relatedly, trauma can increase parental mental health challenges and may subsequently negatively affect parenting by decreased responsiveness and sensitivity.^{14,15} Parents with greater experiences of childhood adversity have been shown to be at risk regarding parenting behavior, which in turn negatively affects child social-emotional development in the next generation. However, few have examined how the parental history of adversity during childhood may negatively affect other aspects of child development, including child language development.

Few studies have examined cognitive outcomes among children whose *parents* have a history of childhood adversity. One such study found that the maternal ACE score was associated with increased risk of suspected developmental delay among toddlers.¹⁰ Another study found that mothers with higher ACE scores were more likely to miss well-child visits, reducing opportunities for developmental screenings and appropriate referrals.¹⁶

Parenting behavior may be a mechanism linking parental adversity and subsequent child language development and is therefore a target for intervention. Studies routinely find that positive parenting is associated with better child language outcomes across the earliest years of child development.^{17,18} Other research has demonstrated that children whose parents have experienced interpersonal traumas exhibit less language competence when parent-child interactions are strained,¹⁹ suggesting that parenting behavior may be a link between parental experiences of adversity and subsequent child language competence.

Early Intervention and Child Language

As early childhood language delays are cause for concern, intervention to bolster child language competence is an important and common early intervention referral. There is evidence to support varied interventions to address delays, including parent-implemented,²⁰ home-based,²¹ and relational²² interventions. Taken together, ample evidence suggests that family-level intervention is appropriate for children at risk for, or who

already display, language delays. In particular, relationship-focused and parenting-focused interventions may prevent or ameliorate language delays.

The Present Study

Prospective data were obtained from a socioeconomically and racially diverse sample of mothers and infants. It was hypothesized that mothers' baseline report of childhood adversity would predict worse toddler language competence 1 year later. In addition, it was expected that intervention aimed to improve parental responsiveness, and provide support to broad infant/toddler social-emotional development (i.e., Infant Mental Health Home Visiting) would mitigate the association between parent adversity and toddler language competence in that those who received intervention were not expected to demonstrate the same association between maternal childhood adversity and toddler language.

METHOD

Study Design

These data come from a larger, 5-panel longitudinal study examining the efficacy of an in-home, relationship-based intervention model (Infant Mental Health Home Visiting [IMH-HV]). See Figure 1 for relevant recruitment and attrition information for the longitudinal study, highlighting those who were included in this study. This model was originally developed in Michigan in the 1970s and is currently delivered to more than 1700 parent-child dyads across the state through the community mental health system. IMH-HV treatment focuses on enhancing parental capacity for responsive provision of care, reducing risk of child maltreatment, and improving child social-emotional development.²³ Families may self-refer to IMH-HV or may be referred by other providers (e.g., child's pediatrician or social service agency worker). In this study, eligible mothers were 18 years or older, had legal custody of their age-eligible child (ages 0–24 mo at enrollment), and did not endorse symptoms of substance use disorders or psychosis. In addition, participants needed to endorse social, demographic, or psychological factors typical of those receiving IMH-HV services in the community. Specifically, participants were required to endorse 2 or more from the following list: a screening score that suggested possible depression diagnosis, endorsement of parenting challenges or perceived difficulty with their study child, eligibility for public services based on income, and/or endorsement of high adverse childhood experiences (ACEs; score of 3+ during screening). Interested parents who endorsed <2 risk factors were not eligible.

This study used a randomized controlled design using a priori urn randomization procedures to ensure equal distribution of maternal ACEs, depression diagnosis, and income across conditions. Analyses used an intent-to-treat design. This study underwent Institutional Review Board approval (ClinicalTrials.gov ID NCT03175796,

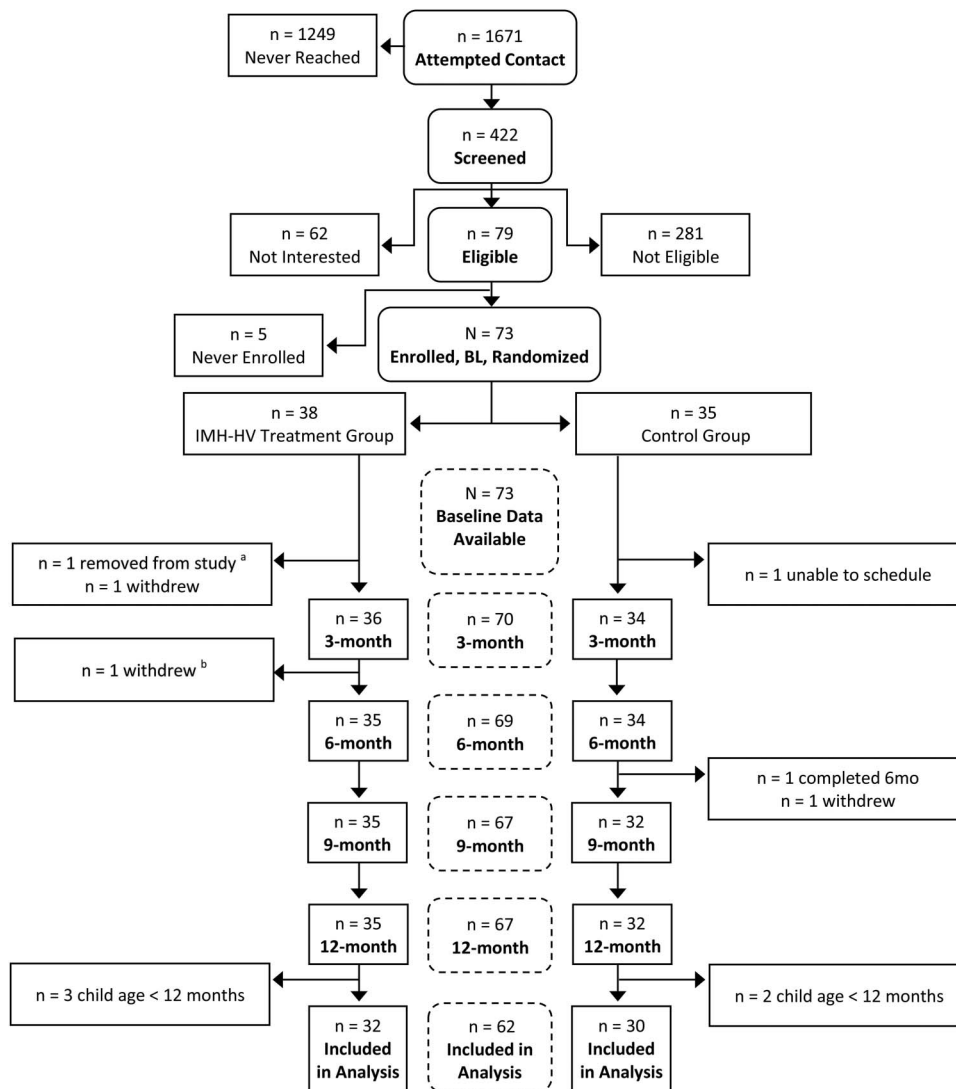


Figure 1. CONSORT diagram. ^aRisk level too high following CPS call; ^bin response to CPS call made by study team. BL, baseline; CONSORT, Consolidated Standards of Reporting Trials; CPS, children’s protective services; IMH-HV, Infant Mental Health Home Visiting.

Michigan Medicine Institutional Review Board: HUM00124224).

Participants

Participants were 62 mother-infant/toddler dyads who engaged in 5 waves of data collection, occurring approximately every 3 months. For this study, the first (baseline) and fifth (12-mo) waves of data collection were used. Overall retention rates were high; 90% of participants completed the 12-month visit, and 94% of those participants had a child old enough to complete a language screener. There were no significant demographic differences between those who remained in this study and those who did not. Table 1 summarizes participant demographics at baseline and at 12 months. Of the sample, 72.6% of mothers were White and 37.0% were African-American. The control group reported more children living in the home compared with the treatment group; Latino/a children were more likely to be in the treatment condition. There

were no other significant demographic differences between conditions.

Procedures

Participants were recruited through flyers posted in the community, referred from providers, or were contacted from a registry of women who recently gave birth and consented to learning more about research studies. Potential participants were screened for eligibility through telephone. Initial in-home data collection visits were scheduled, and consent was obtained from all participants before data collection.

In-home data collection visits were conducted by trained masters-level evaluators who were blind to treatment condition. Data collection included questionnaires, semistructured interviews, biological data (saliva and hair samples), and observations of the home and family. At the 12-month visit, child language was assessed. These visits lasted approximately 3 to 4 hours. Participants were compensated for their participation.

Table 1. Sample Demographics and Key Study Variables

	Total Sample		Treatment Condition		Control Condition		<i>p</i>
	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	
At 12-month evaluation							
N		62		32		30	
Child age (mo)	12.0–36.0	24.24 (6.69)	12.0–36.0	23.59 (6.57)	13.0–36.0	26.93 (6.86)	ns
Mother age (yrs)	22.0–45.0	32.87 (5.36)	22.0–43.0	32.38 (5.72)	23.0–45.0	33.40 (4.99)	ns
Baseline							
N		73		38		35	
Child age (mo)	0–23.8	10.8 (7.2)	0–23.8	9.6 (6.9)	0–23.7	12.0 (7.3)	ns
Mother age (yrs)	19.9–44.2	31.9 (5.7)	19.9–42.8	31.2 (6.1)	22.7–44.2	32.6 (5.2)	ns
Number of people living in home	2–8	4.1 (1.3)	2–7	3.8 (1.2)	2–8	4.4 (1.5)	0.091
Number of children living in home (<18 yr)	0–6	2.0 (1.3)	0–5	1.7 (1.0)	0–6	2.4 (1.4)	0.025
Key study variables							
Maternal ACE score	0–10	3.64 (2.40)	0–10	3.77 (2.34)	0–10	3.64 (2.53)	ns
Child communication score	0–1.00	0.80 (0.31)	0–100	0.84 (0.30)	0–100	0.73 (0.34)	0.11
		% (n)		% (n)		% (n)	<i>p</i>
Family income variables							
Household income <\$20,000		27.8 (20)		31.6 (12)		23.5 (8)	ns
Household income >\$20,000		72.2 (52)		68.4 (28)		76.5 (26)	ns
Currently receive Medicaid/Medicare		45.2 (33)		44.7 (17)		45.7 (16)	ns
Screened eligible for government assistance		63 (46)		60.5 (30)		65.7 (23)	ns
Child race/ethnicity							
White		72.6 (53)		76.3 (29)		68.6 (24)	ns
Black		37.0 (27)		39.5 (15)		34.3 (12)	ns
Hispanic or Latino/a		12.3 (9)		18.4 (7)		5.7 (2)	0.09
Arab or Arab American		5.5 (4)		5.3 (2)		5.7 (2)	ns
Asian/Pacific Islander		5.5 (4)		5.3 (2)		5.7 (2)	ns
American Indian		6.8 (5)		7.9 (3)		5.7 (2)	ns

Participants were able to select multiple racial/ethnic identities; totals are not constrained to sample totals. ACEs, adverse childhood experiences; ns, not significant.

Measures

Parent Experiences of Childhood Adversity

To assess mothers' experiences of childhood adversity, the ACE questionnaire was administered.¹ The ACE is a 10-item, retrospective, self-report questionnaire designed to assess a variety of adversity experienced before age 18 years. Questions include emotional, physical, and sexual abuse; emotional and physical neglect; witnessing intimate partner violence; household substance use; household mental illness; parental separation/divorce; and incarceration of a household member. Each of the 10 items on the measure are rated "yes" or "no," and responses are coded as "1" or "0," respectively.

Researchers have found that individuals who experienced 4 or more ACEs are more likely to experience psychological and physical health conditions and engage in risky behaviors.¹ In this study, ACEs were assessed at baseline ($M = 3.64$; $SD = 2.41$), and scores ranged from 0 to 10, with 52.1% of participants reporting an ACE score of ≥ 4 .

Toddler Language Competence

Toddler language was assessed at the 12-month visit using the Preschool Language Scales–Fifth Edition Screening Test (PLS-5 Screening Test²⁴). The PLS-5 Screening Test is an individually administered clinical developmental screening tool to detect speech/language disorders among children up to age 7 years. The measure can be administered in 5 to 10 minutes and screens for numerous language domains.²⁴ Children who do not pass the screener are typically referred for additional speech/language assessment. The PLS-5 Screening Test is well-validated and reliable.²⁴ The measure was administered by trained, masters-level evaluators with training and expertise in child development. Language was assessed by these evaluators, who had interacted with these children approximately every 3 months over the past year, after they had been in the home for several hours; waiting until later in the visit was meant to increase comfort of the child with the examiner and to allow the examiner to observe many possible examples

of communication skills exhibited by the toddler. Although using the parent report is a valid and reliable approach, particularly in the context of a very brief evaluation,²⁴ because PLS-5 data were collected in the home, during visits that on average lasted >2 hours, and because data collection was completed by evaluators who had made regular visits (5 visits within 12 mo) with the family over the past year, the parent report was not vital to supplement child behavioral responses on the language screen. Therefore, language/communication skills in which children were *observed* engaging during the evaluation visit were assessed. As the use of expressive language was an outcome, only toddlers of 12 months or older at the time of language screening were included in this study.

Each PLS-5 domain assessed produces a continuous score with corresponding pass/not pass cutoff scores, indicating whether the toddler has adequately developed communication skills or whether more assessment is needed. The Language and Social/Interpersonal subscales were used; Language subscale items assessed receptive and expressive language, and Social/Interpersonal subscale items assessed social communication behaviors, including attending to others, responding to one's name, and communicating distress in a nondisruptive manner. Within this sample, 82.3% ($n = 51$) of toddlers passed the Language subscale, and 75.8% ($n = 47$) passed the Social/Interpersonal communication subscale. Continuous scores on these scales were used to create a composite Communication scale, evaluating proportion of items passed across both domains. Parents were notified if their toddler did not pass the language screening test (regardless of treatment condition), so as not to withhold important developmental health information from families.

Treatment

These data come from a randomized controlled trial designed to assess the effectiveness of IMH-HV services. Participants randomized to the treatment condition were offered up to 12 months of IMH-HV services; those in the control condition were provided a list of community resources.

This clinical intervention is a multifaceted, needs-driven intervention that provides services to parents and their infants/toddlers, focuses on the parent-child relationship, and is delivered within the home.^{23,25} A more comprehensive overview of the intervention can be reviewed in other works that have established the effectiveness of the intervention for strengthening parent and child outcomes in community mental health settings and with child welfare—involved populations.^{26–28} IMH-HV providers receive training in the model and are also required to be eligible for endorsement as IMH specialists.²⁸ Infant-parent psychotherapy is a unique therapeutic component of IMH-HV compared with other home visiting models. It enables providers to observe patterns of interactions between the parent and the child and to assess for and address underlying unresolved

traumas or losses for the parent that might influence their relational patterns and experiences in interaction with the baby. Other core components of this model include case management, developmental guidance, emotional support, and life course planning. Use of video feedback with parents is integrated based on previous findings that a video review enhances treatment response.²⁸

Although child language development is not a core target outcome of IMH-HV, developmental guidance is an important therapeutic strategy used to help parents understand and scaffold their children's development. Assessment of child development across many domains, including language, by the IMH-HV clinician is regularly incorporated into IMH-HV treatment. In addition, support for positive parenting (e.g., responsiveness and sensitivity toward the child) is a key component of IMH-HV and has also been linked to improved child language development in previous studies.¹⁸

One aspect of this intervention is that it is needs-driven, meaning that the provider sets collaborative goals with the parent, focusing on the areas of need that are greatest first and then shifting focus to other aspects of the intervention as appropriate. For example, a family with high need for goods/services would receive case management and increasing service access before engaging in psychotherapeutic work. Alternatively, more affluent or economically stable families may require emotional support or developmental guidance as an early component of intervention. Despite the flexibility of implementation, clinician fidelity to the treatment model was monitored using the IMH Fidelity Checklist,²⁶ and fidelity was met throughout this study.

In this study, 75% ($n = 29$) of participants assigned to the treatment condition attended >10 sessions with their provider; 50% ($n = 19$) attended >26 sessions. Five parents (13%) who were assigned to the treatment condition never attended any IMH-HV sessions. These participants were retained in the treatment condition as assigned for all subsequent analyses. The range of sessions is large and reflects that this is a needs-driven model, and variability in dose is consistent with community-delivered practice.

Data Preparation and Analysis

Complete language screening data were available for 62 children who were 12 months or older at the time of the 12-month assessment. Data related to other study variables were available for these 62 families; no data estimation was required. Analyses were conducted using SPSS Version 26.0.

Descriptive statistics were used to examine sample characteristics, and linear regression models examined the association between maternal ACE score and child language competence. Sample characteristics that were associated with key study variables, including child age, child ethnicity, household income, and household density, were retained as possible covariates in the full

models. Before hypothesis testing, data were screened for normalcy and to ensure that all relevant data assumptions were met before analysis. Owing to the theoretical expectation regarding the impact of treatment, single-tailed moderation analyses evaluating the interaction between maternal ACE score and treatment condition (treatment group vs control group) were conducted using the PROCESS macro for SPSS.²⁹ PROCESS estimates nonstandardized coefficients using maximum likelihood regression.

RESULTS

Preliminary Analyses

Table 2 summarizes descriptive statistics for study variables, covariates, and correlations among variables for the entire sample, including both treatment and control groups. Compared with national prevalence data, on average, the maternal adverse childhood experience (ACE) score in this study was high ($M = 3.64$; $SD = 2.41$). Proportion correct on the Preschool Language Scales—Fifth Edition Screening Test indicated that toddler language competence ranged from a proportion score indicating a need for the follow-up to a score indicating no concern ($M = 0.80$; $SD = 0.31$). The number of adverse experiences reported by mothers was negatively associated with toddler performance on the communication composite of the language screener ($r = -0.33$, $p = 0.008$). Child performance on the language screener trended toward a negative association with number of people living in the home ($r = -0.20$, $p = 0.10$); toddlers with worse language development may tend to live with more people. Finally, mother age was associated with child age ($r = 0.28$, $p = 0.04$), people in the home ($r = 0.27$, $p = 0.04$), and household income ($r = 0.48$, $p = 0.000$) because older mothers tended to have older children enrolled in this study, lived in homes with more people, and lived in homes with higher household incomes. These bivariate associations were also examined within each treatment group. Overall, the significance level and magnitude of these associations

largely did not differ between treatment groups, with the exception of the association between maternal childhood adversity and child performance on the language screener. Specifically, the bivariate association was stronger among the control condition ($r = -0.50$, $p = 0.005$) and was weak and nonsignificant among the treatment condition ($r = -0.18$, $p = 0.31$).

Primary Analyses

The model assessing associations among maternal childhood adversity, child language 12-month post-enrollment, and treatment condition was significant ($R^2 = 0.25$, $F(5,55) = 3.74$, $p = 0.006$). Initial models included covariates, including maternal age, child age, child ethnicity, household density, and household income. The maternal ACE score was negatively associated with toddler language such that mothers with more ACEs had toddlers with poorer communication skills 12 months after enrollment in the study. Child age, household density, and household income approached significance; treatment condition was not associated with toddler communication performance.

When examining how treatment condition moderated the association between maternal adversity and toddler communication competence, the overall model was significant ($R^2 = 0.29$, $F(6,54) = 3.72$, $p = 0.004$); see Table 3. Household income was positively associated with toddler communication, and the negative association between maternal ACE score and toddler communication remained. There was no main effect of treatment condition on toddler communication. There was a significant interaction between maternal ACE score and treatment condition, illustrated in Figure 2 ($b = 0.05$, $SE = 0.03$, $t(54) = 1.73$, $p = 0.04$). Simple slope analysis revealed that, for families assigned to Infant Mental Health Home Visiting treatment, there was no association between mother ACE score and later toddler performance on the communication composite ($b = -0.027$, $SE = 0.022$, $t(54) = -1.24$, $p = 0.22$). For families assigned to the control condition, the mother ACE score was negatively associated with toddler

Table 2. Descriptive Statistics for and Bivariate Correlations Among Study Variables for the Total Sample

	M (SD)	Parent ACE Score	PLS-5 Score	Treatment Condition	Parent Age	Child Age	People Living in Home
Key study variables							
Parent ACE score (baseline)	3.64 (2.40)	—	—	—	—	—	—
PLS-5 Communication Score—proportion correct	0.80 (0.31)	-0.33**	—	—	—	—	—
Treatment condition		0.03	0.17	—	—	—	—
Covariates							
Parent age in yrs (12-month follow-up)	32.87 (5.36)	-0.17	-0.05	-0.10	—	—	—
Child age in mo (12-mo follow-up)	24.24 (6.69)	-0.11	-0.13	-0.10	0.26*	—	—
Number of people living in the home	4.10 (1.30)	0.01	-0.20	-0.23	0.27*	0.03	—
Household income	10.17 (6.91)	0.13	0.20	-0.05	0.48***	0.06	0.11

Parent ACE score: adverse childhood experiences; child communication ability: PLS-5; treatment condition: 1 = IMH-HV, 0 = list of community referrals; household income: assessed through participant identification with the income band (e.g., \$0–\$5000 annual household income), range 1 to 21. * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$. ACEs, adverse childhood experiences; IMH-HV, Infant Mental Health Home Visiting; PLS-5, Preschool Language Scales—Fifth Edition Screening Test.

Table 3. Main and Interaction Effects of Maternal Experiences of Childhood Adversity and Intervention on Child Communication Ability

Model 1	Child Communication		
	b	SE	t
Control variables			
Child age	-0.01	0.01	-1.82
Household income	0.01	0.01	1.89
Household density	-0.05	0.03	-1.67
Study variables			
Constant	1.32	0.21	—
Parent ACE score	-0.05	0.02	-3.27**
Treatment condition	0.80	0.08	1.04
Model 2	Child Communication		
	b	SE	t
Control variables			
Child age	-0.01	0.01	-1.75
Household income	0.01	0.01	2.01*
Household density	-0.04	0.03	-1.49
Study variables			
Constant	1.33	0.24	—
Parent ACE score	-0.08	0.02	-3.60***
Treatment condition	-0.11	0.14	-0.82
Treatment condition × parent ACE score (moderator)	0.05	0.03	1.73*

Model 1: Overall model: $R^2 = 0.25$, $F(5,55) = 3.73$, $p = 0.006$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Model 2: PROCESS does not provide standard estimates. Overall model: $R^2 = 0.29$, $F(6, 54) = 3.72$, $p = 0.004$. Parent ACE score: adverse childhood experiences. Child Communication: PLS-5. There were 5 families assigned to the treatment condition who did not attend any treatment sessions. When models were reanalyzed considering these families to be part of the control condition, significance of findings did not change. When models were reanalyzed removing these 5 families from analyses altogether, significance of findings did not change. ACEs, adverse childhood experiences; PLS-5, Preschool Language Scales—Fifth Edition Screening Test.

language ($b = -0.079$, $SE = 0.022$, $t(54) = -3.60$, $p = 0.001$). In other words, intervention buffered the negative impact of the maternal history of childhood adversity on toddler language.

DISCUSSION

The goal of this study was to examine the impact of maternal adversity on a critical aspect of toddler development—language. In addition, this study aimed to

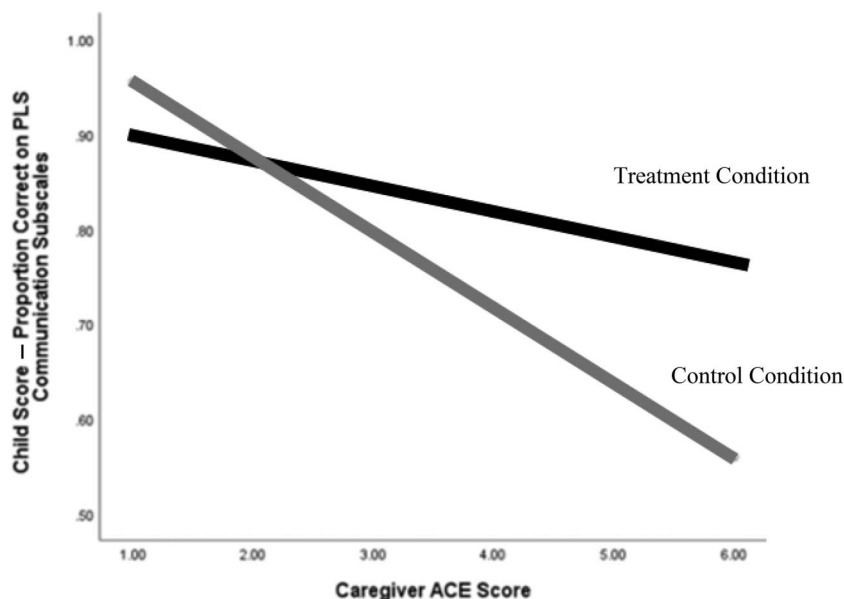


Figure 2. Interaction between caregiver experiences of childhood adversity and intervention condition on child communication screener performance. Conditional effects for each slope are as follows: Control Condition: $b = -0.08$, $SE = 0.02$, $t(54) = -3.60$, $p = 0.0007$; Treatment Condition: $b = -0.03$, $SE = 0.02$, $t(54) = -1.24$, $p = 0.2194$. ACE, adverse childhood experience; PLS, Preschool Language Scales.

examine whether participation in an in-home, relationally based psychotherapeutic intervention during the early childhood period (child age <3 yrs) mitigated negative impacts of maternal adversity on toddler language development. Consistent with our hypotheses, a higher maternal adverse childhood experience (ACE) score was associated with lower toddler language competence, as measured by a communication composite score. For families randomized to receive intervention, toddler language competence was similar to that of children whose parents reported low ratings of childhood adversity. The main effect of intervention status on toddler language competence only trended toward significance ($p = 0.11$), suggesting that the Infant Mental Health Home Visiting (IMH-HV) intervention may be particularly effective for families with mothers who have experienced childhood adversity.

This is one of the first studies to establish a direct link between maternal ACE score and child language development in the next generation.¹⁰ Although the ACE score has been found to be associated with a number of maladaptive behavioral and health outcomes for individuals with histories of adversity,¹ this study has demonstrated that the impact of ACEs may be intergenerational. This finding has public health and policy implications in that children of parents with high levels of childhood adversity could be screened for communication/language delays early and referred to intervention services as appropriate. This may be especially valuable when trauma-informed and relationally informed treatment approaches, such as IMH-HV, are available as referrals for families who screen at-risk. Of note, other study variables that approximate environmental risk (e.g., household family income) were not associated with reduced child communication skills. In this study, maternal childhood adversity played a unique role in predicting early childhood language, and this effect was mitigated by intervention.

Because of the far-reaching impact that language development has,³⁰⁻³² identifying early possible delays and connecting young children to services are vital. Doing so can improve academic outcomes for children³⁰ and may reduce financial burden associated with special education services. Furthermore, toddlers with early language delays are at risk for maladaptive outcomes across the life span, such as anxiety and self-esteem concerns.^{31,32} Therefore, improvements in early childhood language/communication skills may protect against social-emotional difficulties.

This study demonstrated that a relationally focused, home-based parenting intervention may buffer the impact of adversity across generations. IMH-HV services are home-based and relationally based, needs-driven services.²³ Therefore, clinicians working with families in which there was evidence of child language delay would likely address this directly in treatment with that family. As a multifaceted intervention, treatment may have included clinician-led or parent-led intervention, focused

on increasing parental responsiveness to child bids for interaction or joint attention, or it may have resulted in formal referrals to speech/language specialists for evaluation or treatment.²⁴ In this study, treatment condition was used as a moderator. For those assigned to receive the IMH-HV intervention, the number of sessions received varied based on family interest and availability, as well as progress toward treatment goals. Despite the range of treatment “dosage,” intervention condition remained a significant moderator in analyses. We have evaluated the session dosage at which the protective effect of intervention begins to buffer against the negative effect of parent ACEs on language. These analyses suggest that after receipt of 17 to 30 sessions, the associations between maternal ACE score and child language score decline from significance. Future work with larger samples should aim to determine adequate dose associated with buffering the negative impact of maternal ACEs on child language development. As IMH-HV treatment was associated with positive child communication *in particular* when mothers reported higher levels of childhood adversity, it seems as though the intervention may be *especially* beneficial to parents with trauma histories. IMH-HV treatment uses sensitive clinical techniques to uncover and explore parental histories of childhood adversity, allowing parents to become more aware of how their own parenting behaviors may have been negatively affected by their experiences of being parented. It may be that for parents with more extensive histories of childhood adversity, this intervention is especially helpful because it works to reduce the stress of adversity on the parenting system, which can “free up” the parent to engage in more sensitive interactions with their children, which in turn may result in improved child developmental outcomes.¹³ Additional work to evaluate the mechanisms for this treatment effect is warranted.

As part of the larger study, referrals for additional treatment or assessments for mothers and their children were tracked across the intervention period. Of note, only 1 mother in the control condition reported that she had received a referral for language screening or intervention for her toddler, suggesting that toddlers of parents who were not engaged in IMH-HV were not necessarily receiving screening and referrals for language assessment, despite these language screenings suggesting that there were children in the control condition who would have benefitted from such referrals.

Strengths of this study include its economically and ethnically diverse sample. This study used a longitudinal, randomized controlled trial design, allowing for evaluation of changes over time in response to intervention. Despite the sociodemographic risk variables selected as inclusion criteria (e.g., history of adversity, mental health challenges, and poverty), retention across this study was impressive at >90%.

This study also has limitations. The sample size is relatively small; future studies should attempt to replicate

these findings in larger samples. Like many studies examining parenting during early childhood, we relied exclusively on maternal caregivers, limiting generalizability. Future studies should determine whether the impact of childhood adversity on subsequent child development is robust across caregiver status. Given that a number of participating infants were newborns or very young infants at study entry, this study was necessarily limited by the absence of a baseline assessment of language competence. This study used a brief language screener to assess communication skills. Future work should use more comprehensive assessments of language and other domains of cognitive development. In addition, despite the overall narrow child age range in this study, regarding assessing language development, child age in this study was quite varied (range 12–36 mo). Because of the developmental expectations for language, it may be that language delays are more easily detected when children are older. In this study, language scores were not associated with child age, but child age is an important factor that should be considered in future studies. Finally, although all participants enrolled in this study spoke English, we did not collect data about other languages spoken in the home. This limits our ability to determine whether child communication scores differ based on the multilingual family status.

In addition, we used a retrospective report of childhood adversity among mothers. Although the ACE measure is widely used, there are limitations with relying on retrospective reports of childhood adversity.³³ As the use of the ACE measure expands, so does the conceptualization of childhood adversity. Others have included expanded ACE measures in their studies to capture community-level adversity, for example. Future studies should consider how these aspects of adversity affect child outcomes in the next generation. Another consideration is that when IMH-HV is delivered in the community, it is often performed without a 12-month maximum time limit for treatment duration, which was imposed on participants in the intervention for this study. This may have implications for outcomes relative to the standard treatment model in the community where duration may vary.

Future studies should aim to elucidate potential mechanisms of treatment effects on language development. The IMH-HV intervention is complex in nature, and later work may help determine whether particular facets of the intervention were related to improvements in toddler communication. For example, determining whether therapists addressed language directly or whether treatment effects were accounted for indirectly through increased parental verbal expression during interaction with the child will be important to address. In addition, more work should be conducted to determine whether the positive effect of treatment on toddler language among children with mothers who have high ACE scores is maintained over time. In particular, assessment following children up to the start of

formal education would be helpful in determining whether these benefits were sustained posttreatment.

CONCLUSIONS

Our results demonstrate that parental childhood adversity may affect development across generations; however, intervention can buffer this negative effect. These results support the use of such interventions among at-risk populations. In addition, support is provided for early childhood assessment and intervention as a mechanism for ameliorating intergenerational risk. Providers in pediatric settings may be first-line interventionists who are well-suited to conduct language screening, refer to early intervention, and to attend to the parental history of adversity.³⁴

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