



Contents lists available at ScienceDirect

## Child Abuse & Neglect



### Research article

# Assessing adverse experiences from infancy through early childhood in home visiting programs<sup>☆</sup>

Lorraine M. McKelvey\*, Leanne Whiteside-Mansell, Nicola A. Connors-Burrow, Taren Swindle, Shalese Fitzgerald

University of Arkansas for Medical Sciences, Department of Family and Preventive Medicine, 4301 W. Markham St, #530, Little Rock, AR 72205-7199, USA

### ARTICLE INFO

#### Article history:

Received 16 July 2015  
Received in revised form 8 September 2015  
Accepted 14 September 2015  
Available online xxx

#### Keywords:

Child abuse and neglect  
Adverse Childhood Experiences  
Home visiting  
Early childhood

### ABSTRACT

The general aim of early intervention and home visiting programs is to support families to minimize Adverse Childhood Experiences (ACEs). However, assessing children's exposure to these risks is complicated because parents serve as the conduit for both measurement and intervention. The primary aims of the study were to develop an assessment of children's exposure to ACEs and to examine concurrently measured parental child abuse and neglect potential and child social-emotional functioning. Home visiting programs in a southern state implemented the Family Map Inventories (FMI) as comprehensive family assessment and child screenings ( $N = 1,282$ ) within one month of enrollment. Children ( $M = 33$  months of age,  $SD = 20$ ) were exposed at rates of 27% to one, 18% to two, 11% to three, and 12% to four or more FMI-ACEs. FMI-ACEs were associated with increased parental beliefs and behaviors associated with child abuse and neglect. FMI-ACEs also significantly predicted the likelihood of the child having at-risk social-emotional development; children with 4 or more FMI-ACEs were over 6 times more likely than those with none to have at-risk scores. The findings add to our understanding of the negative impact of trauma on children and families. Assessing these risks as they occur in a family-friendly manner provides a platform for early intervention programs to work with families to increase family strengths and reduce the impacts of adverse experiences for their children.

© 2015 Elsevier Ltd. All rights reserved.

### Cumulative Risk

For decades, researchers have examined the outcomes of children exposed to multiple risks. Cumulative risk models fundamentally suggest that as the number of risks to which one is exposed increases so does the likelihood of a negative outcome (Evans, Li, & Whipple, 2013; Rutter, 1979, 2000; Sandler, 2001) and that exposure to risks can often cascade, with one risk leading to another (Masten et al., 2005). Findings from cumulative risk studies have documented the deleterious effects of an accumulation of risks on children's cognitive (Sameroff, Bartko, Baldwin, Baldwin, & Seifer, 1998; Sameroff &

<sup>☆</sup> Funding for this study was made possible in part by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number D89MC23141 of the Affordable Care Act - Maternal, Infant, and Early Childhood Home Visiting Program awarded to the Arkansas Department of Health. This study was also funded in part by the HHS Office of Head Start (90YD0254) and Administration on Children, Youth, & Families (90YF0051). The information or content and conclusions expressed in this material or by speakers and moderators are those of the author(s) and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS, or the U.S. Government.

\* Corresponding author.

Seifer, 1983; Sameroff & Seifer, 1995; Sameroff, Seifer, & Bartko, 1997) and psychosocial functioning (Garnezy & Rutter, 1983; Jenkins & Keating, 1999; Rutter, 1979, 1981, 1985, 1987, 1990, 1996; Rutter, Champion, Quinton, Maughan, & Pickles, 1995; Rutter & Quinton, 1977; Rutter & Quinton, 1984).

Findings from a retrospective study of cumulative risk, the Adverse Early Childhood Experiences (ACEs; Anda et al., 2006; Felitti et al., 1998) study have prompted recent discussion about the deleterious impact of childhood traumatic experiences on long-term psychosocial and physical health and well-being. The ACEs research demonstrates that serious adverse experiences in childhood (e.g., child maltreatment and associated family characteristics) were associated with psychosocial problems in adults; including depression, anxiety, suicide, aggression, and intimate partner violence (Anda et al., 2006; Felitti et al., 1998). Exposure to ACEs also increases the likelihood of individuals' participation in health behaviors related to less optimal physical health such as smoking, abuse of alcohol and other drugs, risky sexual behavior, and physical inactivity (Anda et al., 2006; Felitti et al., 1998). Adverse experiences in childhood also increase the likelihood of serious illnesses and early mortality in adulthood, such as obesity, cancer, and diseases of the heart, lungs, and liver (Felitti et al., 1998).

Cumulative risk studies have also demonstrated effects of a risk threshold. Rutter (1979) examined the likelihood of child psychiatric diagnosis in 10-year-old children based on the contribution of six risk factors (socio-economic status, family density, marital distress, maternal depression, paternal antisociality, and removal of child from the family). In this study, only 2% of children in families with zero or one risk factor exhibited psychiatric problems, compared to 20% of children in families with four or more risks. The ACEs study also demonstrated a threshold of four risks, retrospectively reported, for predicting the most deleterious outcomes in adulthood (Anda et al., 2006; Felitti et al., 1998). Further, exposure to more ACEs increased the number of comorbid adverse outcomes in adulthood such that those with the highest level of ACEs experienced nearly three times the comorbid conditions as those with no adverse experiences (Anda et al., 2006).

While developmentalists have long discussed the negative impact of exposure to multiple risks in the home and caregiving environment, the ACEs study brought this information to the medical and early intervention community in a way that has generated much public attention. In fact, public health initiatives in many states have begun assessing the population for ACEs. The study highlighted the life-long impacts of risk exposure in childhood, including the impact on outcomes never before examined, such as cancer and early death. This has resulted in new efforts to understand the mechanisms behind the long-term impact of childhood trauma on health and development as well as to find novel ways to assess ACEs and intervene with at-risk individuals, both adults and children.

### Adverse Childhood Experiences Screening

Because of the strong evidence from the study of ACEs, there is a growing demand to assess retrospective childhood trauma in clinical practice (Schubert, 2015; Starecheski, 2015) as well as in early intervention (Zorrah, 2015). For example, home visiting programs in some states are assessing parents' ACEs (e.g., Louisiana's NEAR@Home and Iowa's ACEs training; "ACES 360 Iowa," n.d.; Zorrah, 2015). While assessing parents' exposure to ACEs has the potential to inform clinical and psychosocial intervention, preventing young children's exposure to adverse events and their resulting trauma presents a great public health opportunity to promote long-term wellness. Indeed, it is the general aim of early intervention and home visiting programs to support families to minimize the adverse experiences of their children. However, assessing children's exposure to these risks can be complicated and uncomfortable for service providers, particularly as the parent is the partner in the intervention as well as the conduit through which a very young child's ACEs are assessed.

When assessing ACEs specifically, the research conducted to date includes a retrospective report from adults of their experiences in childhood including; physical and emotional abuse and neglect, sexual abuse, household substance abuse, having an incarcerated household member, domestic violence, parental separation or divorce, and parental mental illness (Anda et al., 2006; Felitti et al., 1998). A benefit of this retrospective study is the ability to study the long-term correlates of childhood trauma. However, screening and assessing family situations in the present is needed to aid early intervention efforts and further the research on exposure to adverse experiences for children. The original ACEs questionnaire is not appropriate in its current form to be administered to parents to answer about the experiences of their young children. For example, while it was possible to ask adults to retrospectively report on experiences of various forms of abuse as children, early intervention providers cannot simply ask parents if they are abusing their young child. Similarly, the original ACEs study asked adults if their parents abused alcohol or drugs during their childhood. Again, this approach must be adapted when asking parents directly about their current substance use/abuse. It is preferable to screen for symptoms of a major risk factor such as substance abuse. Therefore, new approaches must be developed to efficiently identify families whose children are experiencing ACEs, including engaging in behaviors that are illegal or precursors to abusive/neglectful parenting. While there are methods available to screen for many of these factors individually (e.g. well-established child abuse risk measures, substance abuse screening tools), we are unaware of any tools that can efficiently screen for the range of experiences represented in the ACEs study.

#### Specific Aims

The first purpose of this study is to demonstrate the assessment of very young children's (birth to five years) exposure to adverse experiences. Given the evidence that exposure to ACEs has lasting negative effects on development, methods of

identifying young children who are experiencing ACEs are needed. This study describes a newly developed ACEs screening tool for infants, toddlers, and preschoolers. The index can be delivered in the context of home visiting or other early intervention services thereby giving family and child support professionals the needed tools to support change.

The second purpose of the study is to examine parenting beliefs and behaviors that should be positively associated with an ACEs index. Because half of the ACEs indicators tap child neglect and abuse, we will also examine the associations between this newly developed ACEs index and concurrently assessed parenting beliefs and behaviors that are known to be associated with child maltreatment. We would expect a positive association between measures of potential child maltreatment and an ACEs index. However, as it is imperative to use items that indirectly capture child maltreatment risk as a result of assessing ACEs for children from their parents, it is possible that associations with other measures of maltreatment potential could be weakened. A positive association between the newly developed tool and concurrently measured maltreatment risk serves as evidence that the tool is adequately capturing ACEs.

Finally, the third purpose of the study is to examine whether child psychosocial well-being is negatively impacted by ACEs. Retrospectively reported ACEs and cumulative risks in childhood have been found linked to increased social and psychological problems (Anda et al., 2006; Evans et al., 2013; Sandler, 2001). Therefore, we would expect a negative correlation between a child's ACEs burden and their optimal psychosocial functioning. Again, though, this indirect measurement of ACEs could reduce the strength of the association. As a whole, this study will add to the literature on effective screening of ACEs and the effects of cumulative risk exposure for very young children.

## Methods

### Study Design

In general, home visiting programs are two-generation programs designed to serve at-risk families with children below the age of five. This study uses evaluation data collected during the implementation of home visiting programs, funded through the Maternal Infant and Early Childhood Home Visiting (MIECHV) program, in the southern United States. Families included in the analysis voluntarily enrolled in three evidence-based home visiting models. Two models, Healthy Families America and Parents as Teachers, serve expectant families or those with children up to age three. The third model, Home Instruction for Parents of Preschool Youngsters, serves families with children between the ages of three and five. In addition to the individual eligibility criteria for each of the evidence-based models, families were eligible for services if they reported risks associated with less optimal parenting. These risks included demographic characteristics (low-income or a single and/or teen parent), parent characteristics (such as parental history of abuse, incarceration, military deployment, disability, or chronic illness), and child characteristics (developmental delay, pre-term/low birth-weight, disability, or chronic illness). The evaluation study was approved by the University of Arkansas for Medical Sciences' Institutional Review Board.

### Sample Description

We used data collected at enrollment into services ( $N = 1,282$ ) to examine children's ACE scores at or near the beginning of services. The vast majority of families (84%) were living at or below 100% of the federal poverty line. Primary caregivers were 28 years old on average ( $SD = 8$ ). The majority were White (60%) with another 22% being African-American and 16% of Hispanic ethnicity. The majority of primary caregivers reported having a high school diploma or general equivalency (39%). Finally, caregivers were single (53%) or married or cohabiting with a partner (47%). Children were 33 months of age on average ( $SD = 20$ ) and were nearly equally divided on gender (49% male). Table 1 shows family and child demographics at enrollment.

### Measures

Home visitors complete family assessments and child screenings within one month of enrollment into services.

*The Family Map Inventories.* The Family Map Inventories (FMI; Whiteside-Mansell et al., 2007, 2013) are a set of semi-structured interviews developed to assess important aspects of the family and home environment associated with well-being in birth to 5-year old children. There are three versions of the Family Map Inventories based on the age of the child at the time of assessment. For the purposes of this study, we examine enrollment data collected with the Infant/Toddler (birth to three years) and Early Childhood (3–5 years) version of the FMI. The instruments were designed to be used during home visits. The FMI systematically identify areas of concern and strength so that providers can design interventions to reduce risk factors (e.g., food insecurity, physical safety issues, family conflict, harsh parenting practices, or parental depression) or to enhance factors associated with healthy development (e.g., availability of learning materials in the home, good monitoring and supervision, or home safety). The FMI domains cluster into three broad areas: (1) physical and social conditions that children experience directly, (2) family climate/context, and (3) parental characteristics. Estimates of test-retest reliability and construct validity were adequate (Whiteside-Mansell et al., 2007, 2013). Compared to national estimates, notably those reported in the Head Start FACES study (U.S. Department of Health and Human Services, 2002) and the Early Head Start Baby FACES study (Vogel et al., 2015), the estimates from the FMI suggest that the rate of identification is consistent with rates found for other low-income families.

**Table 1**  
 Individual and family characteristics as a percentage of the sample.

	Total (N = 1,282)
<i>Child Characteristics</i>	
Child is male	49.2
Child age: months at enrollment (M, SD)	33 (20)
Infant/toddler (<36 months)	42.1
<i>Parent/family characteristics</i>	
Parent age: years at enrollment (M, SD)	28 (8)
Teen (<20 years)	10.9
Race/ethnicity	
Caucasian	60.2
African-American	21.6
Hispanic	15.8
Other	2.4
Education	
Less than high school graduate	26.9
High school graduate or equivalent	38.5
Some college or degree	34.6
Employment status	
Unemployed	60.2
Part-time	9.2
Full-time	30.6
Marital status	
Single	46.9
Married/cohabitating	47.0
Separated/divorced/widowed	6.1
Family income: percent of poverty (M, SD)	0.59 (0.45)
100% of poverty or less	83.9

**Table 2**  
 Family Map Inventories – Adverse Childhood Experiences at enrollment.

Original construct	Family Map Inventories items	FMI-ACEs % N = 1,282	ACEs Study % N = 17,337 <sup>a</sup>
Emotional abuse	Family Members Lose Tempers and Yell in Anger (Often or Always) and/or Discipline Strategy to Yell at Child (Often or Always)	7.4	10.6
Physical abuse	In Past Year Child Physically Hurt by Someone (>="Once") and/or Discipline Strategy to Spank with Object (>="Rarely")	18.7	28.3
Sexual abuse	In Past Year Child Seen Drug or Sexual Activities (At least "Once") and/or Open Child Protective Services Case	5.7	20.7
Emotional neglect	Family Members Feel Close and Help and Support (Not Often or Always)	20.2	14.8
Physical neglect	Food Did not Last or Cut Meal Size/Skipped (True) and/or Lived in Temporary Housing (Yes) or Observed Cluttered or Crowded Home	33.4	9.9
Parental separation or divorce	Parent Living Outside the Home and/or Owed Child Support	30.9	23.3
Mother treated violently	In Past Year You or Someone in Home Physically Hurt or Child Seen Someone Physically Hurt (At least "Once")	6.2	12.7
Household substance abuse	Friends/Family with Drinking/Drug Problem in Home or CAGE (Yes) or Observed Concern	4.3	26.9
Household mental illness	Patient Health Questionnaire-2 <sup>b</sup> Screen Positive or Observed Concern	15.4	19.4
Incarcerated household member	Family Involved w/Legal System	10.9	4.7
<i>Totals</i>			
None		31.9	36.1
One		27.4	26.0
Two		17.7	15.9
Three		11.2	9.5
Four or more		11.9	12.5
Total (M, SD)		1.52 (1.55)	Unavailable

<sup>a</sup> <http://www.cdc.gov/violenceprevention/acestudy/prevalence.html>.

<sup>b</sup> Kroenke, Spitzer, and Williams (2003).

We identified items from the Infant/Toddler and Early Childhood versions of the FMI that directly tap the constructs retrospectively reported in the ACEs study (FMI-ACEs; items presented in Table 2). We purposefully identified items to represent the constructs of the original ACE scale, but included only items that measure risk within a quantifiable period of time (i.e., the longest period of time for which parents report is one year). While the original ACE measure is retrospective, and therefore includes historical reports of risk, we developed the FMI-ACEs to allow service providers to screen the current environment in which the child is developing and provide the ability to measure change in risk across time.

During the FMI, the interviewer also observes parental warmth, the absence of which could be indicative of emotional neglect. *Maternal Warmth/Emotional Neglect Risk* was measured with 8 items from the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO; Cook & Roggman, 2009; Roggman, Cook, Innocenti, Jump Norman, & Christiansen, 2009). The PICCOLO is an observational instrument designed to measure positive parenting along four domains known to support children’s early development: (1) Affection, (2) Responsiveness, (3) Encouragement, and (4) Teaching. The PICCOLO was developed for use with parents of children 10–47 months of age. The FMI use 8 items from the PICCOLO’s Affection and Responsiveness scales that include affectionate touching, smiling, praising, and positive regard. Cronbach’s alpha for the Parental Warmth scale was .90 and test–retest reliability was 80% (Whiteside-Mansell et al., 2007, 2013). Emotional Neglect Risk on the FMI is defined as having five of eight items where the parent’s behaviors are not at all or hardly observed.

The *Adult-Adolescent Parenting Inventory* (AAPI-2; Bavolet & Keene, 2001) was used to further measure parenting beliefs associated with abusive/neglectful parenting. The purpose of the AAPI-2 is to determine the degree to which respondents agree or disagree with parenting behaviors and attitudes known to contribute to child abuse and neglect. Parenting attitudes are measured in five scales: Inappropriate Expectations for Children, Parental Lack of Empathy, Strong Belief in the Use of Corporal Punishment, Reversing Parent–Child Roles, and Oppressing Children’s Power and Independence. Test–retest and internal consistency reliability coefficients for the subscales were high and ranged from .87 to .96 and .86 to .96, respectively. The AAPI-2 was developed on a five-point Likert scale ranging from Strongly Agree to Strongly Disagree. The AAPI-2 is converted from raw scores to standard scores (by race, sex, and age) for developing a risk profile that can be compared with a national sample of parents. The standard scores provide a risk index of practicing abusive and neglecting parenting and child rearing behaviors (standard scores of 3 or lower on a 1–10 scale are indicative of risk).

The *Ages & Stages Questionnaires: Social–Emotional* (ASQ:SE; Squires, Bricker, & Twombly, 2002) was used to screen for children’s social–emotional behavior problems. The ASQ:SE consists of a series of age-related questionnaires that assess seven behavioral areas: self-regulation, compliance, communication, adaptive functioning, autonomy, affective functioning, and interaction with others. Administration time is 10–15 min. Each questionnaire consists of a set of items scored on a 3-point Likert scale, scored 0 (most of the time), 5 (sometimes), or 10 (never or rarely) points based on the frequency with which parents indicate their child does a behavior. Cut-off scores indicating a child is at risk of social–emotional developmental problems are provided based on the age of the child at assessment. The higher the score, the greater the concern for development. The ASQ:SE has strong test–retest reliability (three-week test–retest for children classified as “at risk” was 94% and intraclass correlations ranged from .75 to .82) and internal consistency reliability (Cronbach’s alpha ranged from 0.67 to 0.91, with an overall alpha of 0.82).

**Results**

In our study, nearly one-third (32%) of children enrolled in services were not exposed to adverse experiences. Those children with adverse experiences were exposed at rates of 27% to one, 18% to two, 11% to three, and 12% were exposed to four or more FMI-ACEs (see Table 2). The average number of FMI-ACEs was 1.5 (SD = 1.6; Range 0–8). For comparison, when individuals retrospectively report about their childhoods as in the original study, 36% were not exposed to FMI-ACEs and 26%, 16%, 9.5%, and 12.5% were exposed to one, two, three, and four or more FMI-ACEs, respectively (Centers for Disease Control & Prevention, 2014). Table 2 provides a breakdown of percentages of individual FMI-ACEs.

Analysis of Covariance (ANCOVA) examined the association between children’s FMI-ACEs scores (matching the analyses done in the original studies, which included groups with no, one, two, three, and four or more FMI-ACEs) and concurrently measured parenting beliefs and attitudes on the AAPI-2 and FMI (see Table 3). All analyses controlled for program model and for parent and family demographics, including primary caregiver age, education and race. Results demonstrate infant, toddlerhood, and early childhood FMI-ACEs were associated with concurrently measured total AAPI-2 scores ( $F(4, 1148) = 2.88, p = .02$ ). As FMI-ACEs scores increased, parenting beliefs were less optimal. Post hoc pairwise Least Significant Difference

**Table 3**  
 Parenting differences by Family Map Inventories – Adverse Childhood Experiences Classification: ANCOVA and Pairwise Post Hoc Comparisons Results.

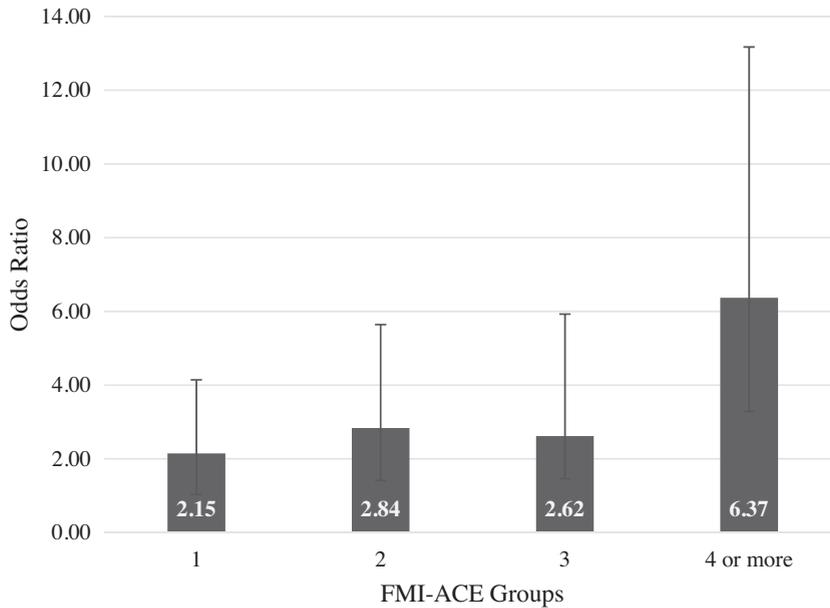
Construct	Number of FMI-ACEs					F-test
	0	1	2	3	4 or more	
Adult-Adolescent Parenting Inventory-2						
Total score	4.82 (0.08) <sup>a</sup>	4.81 (0.08) <sup>a</sup>	4.71 (0.10) <sup>a</sup>	4.63 (0.12) <sup>ab</sup>	4.36 (0.12) <sup>b</sup>	2.88*
Inappropriate expectations	4.93 (0.09) <sup>a</sup>	4.87 (0.09) <sup>a</sup>	4.83 (0.12) <sup>a</sup>	4.68 (0.14) <sup>ab</sup>	4.43 (0.15) <sup>b</sup>	2.38*
Lack of empathy	4.69 (0.11) <sup>a</sup>	4.80 (0.12) <sup>a</sup>	4.62 (0.15) <sup>a</sup>	4.53 (0.18) <sup>a</sup>	4.03 (0.18) <sup>a</sup>	3.29**
Corporal punishment	4.55 (0.09) <sup>a</sup>	4.17 (0.10) <sup>a</sup>	4.19 (0.12) <sup>a</sup>	4.15 (0.15) <sup>a</sup>	3.98 (0.15) <sup>b</sup>	3.60**
Reversing roles	5.85 (0.12) <sup>a</sup>	6.17 (0.13) <sup>a</sup>	5.88 (0.16) <sup>a</sup>	5.93 (0.20) <sup>a</sup>	5.49 (0.20) <sup>a</sup>	2.25
Oppressing independence	4.13 (0.10) <sup>a</sup>	4.03 (0.11) <sup>a</sup>	3.98 (0.13) <sup>a</sup>	3.86 (0.16) <sup>a</sup>	3.92 (0.16) <sup>a</sup>	0.61
Observed parental warmth	2.92 (0.02) <sup>a</sup>	2.92 (0.03) <sup>a</sup>	2.85 (0.03) <sup>b</sup>	2.81 (0.04) <sup>a</sup>	2.68 (0.04) <sup>d</sup>	8.46**

Notes: Estimated Marginal Means (SEs) in columns. Homogeneous groups indicated by superscripts based on post hoc comparisons.

\*  $p < .05$ .

\*\*  $p < .01$ .

Please cite this article in press as: McKelvey, L. M., et al. Assessing adverse experiences from infancy through early childhood in home visiting programs. *Child Abuse & Neglect* (2015), <http://dx.doi.org/10.1016/j.chiabu.2015.09.008>



**Fig. 1.** Odds ratios for problematic social-emotional development across levels of Family Map Inventories – Adverse Childhood Experiences (Compared to children in families with no FMI-ACEs).

comparisons (shown in Table 3) suggest that the mean AAPI scores for parents in families with 4 or more FMI-ACEs are significantly lower, denoting less optimal beliefs, than those with fewer FMI-ACEs. Similar findings in the same direction occurred for many of the AAPI-2 scales including Inappropriate Expectations for Children ( $F(4, 1152) = 2.38, p = .05$ ), Parental Lack of Empathy ( $F(4, 1155) = 3.29, p = .01$ ), and Strong Belief in the Use of Corporal Punishment ( $F(4, 1152) = 3.60, p = .006$ ). There were not significant associations between FMI-ACE score groups and two subscales of the AAPI-2: Reversing Parent-Child Roles ( $F(4, 1151) = 2.25, ns$ ) and Oppressing Power and Independence ( $F(4, 1158) = 0.61, ns$ ). ANCOVA findings also suggest that FMI-ACEs were associated with observed warmth in parent-child interactions ( $F(4, 622) = 8.46, p < .001$ ) such that FMI-ACEs were related to interactions that were rated as less warm as FMI-ACEs scores increased. Post hoc demonstrate that parental warmth is negatively related to FMI-ACEs in a graded fashion; emotional warmth is significantly lower with additional FMI-ACEs.

Logistic regression using the same controls examined the association between children’s FMI-ACEs scores (groups with no, one, two, three, and four or more FMI-ACEs) and whether the overall AAPI-2 or Parental Warmth scores were in the ‘at-risk’ range for parenting concerns. Results reveal a significant association between FMI-ACEs and at-risk AAPI-2 (Wald Statistic = 12.32,  $p = .02$ ) and Parental Warmth (Wald Statistic = 23.12,  $p < .001$ ) scores. Findings suggest families in the highest FMI-ACEs group were more likely to have parenting beliefs associated with child abuse and neglect (at-risk AAPI-2 and Parental Warmth scores). Parents in these families were nearly twice as likely to have AAPI-2 scores in the at-risk range ( $OR = 1.78, CI [1.15, 2.75], p = .01$ ) and over eight times as likely to have Parental Warmth scores in the at-risk range ( $OR = 8.15, CI [2.80, 23.74], p < .001$ ) compared to those with no FMI-ACEs exposure.

The ASQ:SE scores represent typical (“Below Cutoff”) and potentially problematic (“Above Cutoff”) social-emotional behaviors. Logistic regression results reveal a significant association between children’s exposure to adverse experiences and child social-emotional behavior (Wald Statistic = 25.72,  $p < .001$ ). Exposure to any FMI-ACE negatively impacted child behavioral outcomes, but the risks were greatest for those with the most risks. As seen in Fig. 1, compared to child with no FMI-ACEs at enrollment, children with one ( $OR = 2.15, CI [1.13, 4.14], p = .02$ ), two ( $OR = 2.84, CI [1.46, 5.64], p = .003$ ), or three ( $OR = 2.62, CI [1.16, 5.93], p = .02$ ) FMI-ACEs were between two and three times as likely to exhibit social-emotional behaviors in the concern range. Having social-emotional scores in the problem range was highest for children exposed to four or more FMI-ACEs; these children were over six times more likely to have at-risk scores ( $OR = 6.37, CI [3.08, 13.17], p < .001$ ) than children with no FMI-ACE exposure.

## Discussion

The current study extends our understanding of the assessment and correlates of early adverse childhood experiences. First, we have identified how FMI, an existing family assessment tool, can be used to capture information about ACEs in very young children. This is an ideal time to capture ACEs risk, as it is still possible to intervene to reduce children’s ongoing exposure to and trauma associated with these risks. In spite of the differences between our sample (low income, eligible for home visiting based on family risks) and the sample from the original study, the rates of ACEs are strikingly similar and disturbingly common. More than 40% of the sample were exposed to multiple ACEs at a very young age.

Second, we were able to demonstrate a relationship between our efficient and less direct assessment of ACEs (FMI-ACEs), and other measures of abuse and neglect risk on the part of the parent. As measured with the FMI, these adverse experiences were associated with parenting beliefs and behaviors associated with child abuse and neglect. For example, children in families with four or more FMI-ACEs were more than eight times as likely have parents whose interactions demonstrate potential emotional neglect. Thus, while we were unable to ask directly about the child's experience with abuse and neglect for practical reasons, there is evidence that we captured this information in our sample.

Third, we provided evidence which, although not causal, suggests that the impact of ACEs may be seen very early in development. Children with multiple FMI-ACEs were far more likely to fail a screening of social-emotional development. In fact, children with four or more FMI-ACEs were more than six times as likely to score in the at-risk range on the social-emotional screening. This finding is remarkably similar to the findings of the early cumulative risk research, despite the ages of the children being markedly younger, and also converges with the original ACE studies in demonstrating a threshold of four risks for predicting the most deleterious outcomes in adulthood (Anda et al., 2006; Felitti et al., 1998).

Assessing these risks as they occur in a manner that is family-friendly provides a platform for home visiting and other early childhood programs to work with families to increase family strengths and reduce adverse experiences. Our ACEs assessment was embedded in a larger interview between the parent and home visitor. Evidence from prior research indicates that the FMI interview process is acceptable to parents both in content and in length (McKelvey et al., 2013; Whiteside-Mansell et al., 2007, 2013). This is important given that staff concerns about how parents will react are often a key barrier to screening for family risks. The FMI have been successfully embedded in home visiting programs and are now routinely used at enrollment. Anecdotally, we know that many home visitors were anxious about interviewing parents using the FMI given the sensitive nature of some of the questions. However, consistent with prior research (Whiteside-Mansell et al., 2007, 2013), parents typically are open to providing answers to these questions. Home visitors received training in appropriate administration of the FMI, which covers the rationale for the questions, ways to engage families, and what to do when serious risks are identified. It also covers interview style, such as asking questions in a non-judgmental way and emphasizing that we ask these questions of all families. This training is essential for staff who are unaccustomed to discussing sensitive personal issues with families.

Using the FMI to assess the ACEs burden of the children in a family provides home visitors and other early interventionists an avenue to discuss the child's daily experiences and how these influence the child's development and long-term well-being. Fortunately, home visiting and early intervention programs are prepared to support parent and family skill building aimed at promoting optimal child development. For example, most home visiting curricula address ACEs and facilitation of positive parent-child and family interactions, appropriate discipline, and support and referrals for parental depression. Further, these curricular components are expertly prepared to help parents protect their children from the stress of ACEs, even if a reduction in ACEs is not attained. It is important to emphasize the context in which the FMI-ACEs was administered in this study, given potential ethical issues associated with identifying concerns without supports in place for staff and the families they serve. While the FMI-ACEs screening is not primarily intended to identify child maltreatment the potential to do so is inherent in screening. Therefore, implementation of the screening should not only be accompanied by support to providers to address healthy family relationships, but also to report suspected child abuse or neglect.

There are limitations of the current study. We should note that our assessment of FMI-ACEs in young children was specific to families enrolled in one state's home visiting programs. By definition, these families should be at somewhat greater risk than families from the general population. Assessment of FMI-ACEs using a more economically diverse sample would be useful to further the research in this area. Again, the analyses in this study are correlational in nature. A longitudinal analysis of the association between the FMI-ACEs scale and later child outcomes would also further this line of inquiry.

## Conclusion

As a whole, this study adds to the literature on ACEs and the effects of cumulative risk exposure in infants, toddler, and preschoolers. It is the first paper to develop a screening instrument for adverse experiences in the child's life. As a result, its use provides interventionists with a mechanism to start a discussion about the environments that support optimal development for the child. The FMI-ACEs scale is positively associated with other measures of abusive and neglectful parenting which provides evidence that the FMI-ACEs tap similar constructs to the original ACEs items and adequately reflect child maltreatment risk. Finally, while correlational, our findings also suggest that these adverse events hinder children's social-emotional development, putting children on a trajectory for less optimal outcomes at a very early age.

## References

- ACES 360 Iowa: In-person training [web page]. (n.d.). Retrieved from <http://www.iowaaces360.org/training.html> (12.07.15).
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C. H., Perry, B. D., Dube, Sh. R., & Giles, W. H. (2006). *The enduring effects of abuse and related adverse experiences in childhood. European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174–186.
- Bavolek, S., & Keene, R. G. (2001). *Adult Adolescent Parenting Inventory – version 2: Administration and development handbook*. Park City, UT: Family Development Resources, Inc.
- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. (2014). *ACE study: Data and statistics*. Retrieved from <http://www.cdc.gov/violenceprevention/acesstudy/prevalence.html>
- Cook, G. A., & Roggman, L. A. (2009). *Parenting interactions with children: Checklist of observations linked to outcomes* (Technical Report). Logan, UT: Utah State University.

- Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin*, 139(6), 1342.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258.
- Garmezy, N., & Rutter, M. (Eds.). (1983). *Stress, coping, and development in children*. New York, NY: McGraw-Hill.
- Jenkins, J. M., & Keating, D. P. (1999). *Risk and resilience in six-and ten-year-old children*. Human Resources Development Canada, Applied Research Branch.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The Patient Health Questionnaire-2: Validity of a two-item depression screener. *Medical Care*, 41(11), 1284–1292.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., & Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, 41(5), 733.
- McKelvey, L. M., Bokony, P., Johnson, D., Whiteside-Mansell, L., Burrow, N., & Swindle, T. (2013). Family engagement: Establishing a system to support the parent–teacher partnership. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 16(1), 171–175. Retrieved from <https://journals.uncc.edu/dialog/article/view/50/105>
- Roggman, L. A., Cook, G. A., Innocenti, M. S., Jump Norman, V. K., & Christiansen, K. (2009). *Parenting interactions with children: Checklist of observations linked to outcomes user's guide*. Logan, UT: Utah State University.
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent, & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Vol. 3, Social competence in children* (pp. 49–74). University Press of New England: Hanover, NH.
- Rutter, M. (1981). Stress, coping and development: Some issues and some questions. *Journal of Child Psychology and Psychiatry*, 22, 323–356.
- Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, 147, 598–611.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry*, 57, 316–331.
- Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. Rolf, A. Masten, D. Cicchetti, K. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 181–214). New York: Cambridge University Press.
- Rutter, M. (1996). Transitions and turning points in developmental psychopathology: As applied to the age span between childhood and mid-adulthood. *International Journal of Behavioral Development*, 19, 603–626.
- Rutter, M. (2000). Resilience reconsidered: Conceptual considerations. In J. P. Shonkoff, & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (pp. 651–675). New York: Cambridge University Press.
- Rutter, M., Champion, L., Quinton, D., Maughan, B., & Pickles, A. (1995). Understanding individual differences in environmental risk exposure. In P. Moen, G. H. Elder Jr., & K. Luscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 61–93). Washington, DC: American Psychological Association.
- Rutter, M., & Quinton, D. (1977). Psychiatric disorder: Ecological factors and concepts of causation. In H. McGurk (Ed.), *Ecological factors in human development* (pp. 173–187). North-Holland: Amsterdam.
- Rutter, M., & Quinton, D. (1984). Parental psychiatric disorder: Effects on children. *Psychological Medicine*, 14, 853–880.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Seifer, R. (1998). Family and social influences on the development of child competence. In M. Lewis, & C. Feiring (Eds.), *Families, risk and competence* (pp. 161–185). Mahwah, NJ: Erlbaum.
- Sameroff, A. J., & Seifer, R. (1983). Familial risk and child competence. *Child Development*, 54, 1254–1268.
- Sameroff, A. J., & Seifer, R. (1995). Accumulation of environmental risk and child mental health. In H. E. Fitzgerald, B. M. Lester, & B. Zuckerman (Eds.), *Children of poverty* (pp. 233–254). New York: Garland Publishing.
- Sameroff, A. J., Seifer, R., & Bartko, W. T. (1997). Environmental perspectives on adaptation during childhood and adolescence. In S. S. Luthar, J. A. Burack, D. Cicchetti, & J. R. Weisz (Eds.), *Developmental psychopathology: Perspective on adjustment, risk, and disorder* (pp. 507–526). New York: Cambridge University Press.
- Sandler, I. (2001). Quality and ecology of adversity as common mechanisms of risk and resilience. *American Journal of Community Psychology*, 29, 19–61.
- Schubert, K. (2015, March 12). *Re: How childhood experiences shape our nation's health* [Web log message]. Retrieved from [http://www.rwjf.org/en/culture-of-health/2015/03/how\\_childhood\\_experi.html?rid=U7hmF4z9mzr1Pfm64giK4lzjnirr5PNKktYkqV5p7ck&set\\_cid=210772](http://www.rwjf.org/en/culture-of-health/2015/03/how_childhood_experi.html?rid=U7hmF4z9mzr1Pfm64giK4lzjnirr5PNKktYkqV5p7ck&set_cid=210772)
- Squires, J., Bricker, D., & Twombly, E. (2002). *Ages & Stages Questionnaires: Social–Emotional – A parent completed, child-monitoring system for social–emotional behaviors*. Baltimore: Paul H. Brookes Publishing Co.
- Starecheski, L. (2015, March 3). *Re: 10 questions some doctors are afraid to ask* [Web log message]. Retrieved from <http://www.npr.org/blogs/health/2015/03/03/377569539/even-some-doctors-fear-these-10-questions>
- Vogel, C. A., Caronongan, P., Thomas, J., Bandel, E., Xue, Y., Henke, J., Aikens, N., Boller, K., & Murphy, L. (2015). *Toddlers in Early Head Start: A portrait of 2-year-olds, their families, and the programs serving them* (OPRE Report #2015-10). Retrieved from <http://www.acf.hhs.gov/programs/opre/resource/toddlers-in-early-head-start-a-portrait-of-2-year-olds-their-families-and-the-programs-serving-them>
- Whiteside-Mansell, L., Bradley, R. H., Conners, N. A., & Bokony, P. A. (2007). The Family Map: Structured interview to identify risks and strengths in Head Start families. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 10, 189–209.
- Whiteside-Mansell, L., Johnson, D., Bokony, P., McKelvey, L. M., Burrow, N., & Swindle, T. (2013). Using the Family Map: Supporting family engagement with parents of infants and toddlers. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 16(1), 20–44.
- Zorrah, Q. (2015, March 10). *Re: NEAR@Home toolkit: A guided process to talk about trauma and resilience in home visiting* [Web log message]. Retrieved from <https://thrivewa.org/nearhome-toolkit-guided-process-talk-trauma-resilience-home-visiting/>