



## Exploring associations between maternal adverse childhood experiences and child behavior

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### ABSTRACT

Adverse childhood experiences (ACEs) are linked to many negative outcomes for adults, but scant research has examined their intergenerational effects. This study's purpose is (1) to identify whether an association exists between maternal ACEs and children's psychosocial functioning, and, if so, (2) to delineate whether such an association is linked to age in a sample of families involved with the child welfare system ( $N = 259$ ). The relationship between maternal ACEs and child behavior was assessed using OLS regressions, and significant, positive associations were found linking the number of maternal ACEs and children's standardized Child Behavior Checklist scores, on both internalizing ( $B = 0.10, p < .001$ ) and externalizing ( $B = 0.09, p < .001$ ) subscales. Age was not significantly associated with CBCL scores. Findings suggest the need for deeper understanding of the pathways for intergenerational transmission of risk, improved identification of parental risk and its symptoms, use of interventions accounting for parental ACEs, and greater attention to the environmental and societal contexts placing families in risk.

### 1. Introduction

Decades of research on the intergenerational transmission of trauma observes that caregivers' experiences affect not only their parenting capacities but also the emotional and relational development of their children (Clarkson Freeman, 2014; Fonagy, Steele, Moran, Steele, & Higgit, 1993; Fraiberg, Adelson, & Shapiro, 1975; Main & Goldwyn, 1984). These intergenerational effects are found to be present in parent-child relationship quality (Steele et al., 2016), schemas for relationships (attachment classification) (Thomson & Jaque, 2017), and the development of psychopathology in childhood and adulthood (Kessler et al., 2010). While there has been extensive investigation of the ways in which Adverse Childhood Experiences (ACEs) influence physical and psychological developmental trajectories that persist throughout the life course (see Anda et al., 2006 for a review), less attention has been paid to intergenerational effects, specifically whether caregivers' history of childhood trauma is linked to the presence of clinical symptoms in their children. Instead, the majority of studies connecting maternal adversity to negative child outcomes examine single adverse experiences such as physical or sexual maltreatment rather than investigating

the impact of cumulative risk, which research demonstrates has stronger effects than either the type or severity of a singular adverse event (Dong et al., 2004; MacKenzie, Kotch, & Lee, 2011a, MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011b; Madigan, Wade, Plamondon, Maguire, & Jenkins, 2017). Further, ACEs studies examining parenting or child outcomes have either focused on the former or the latter in isolation rather than the potential intergenerational transmission of trauma.

The purpose of this study is to identify whether (1) there is an association between cumulative maternal adversity in childhood and the next generation's psychosocial functioning, as measured by internalizing behaviors (i.e., withdrawing, depression, low affective expression, etc.) and externalizing behaviors (i.e., aggression, rule-breaking, defiance, etc.) and, if so, (2) to delineate whether such an association is linked to child age in a clinical sample of families involved with the Child Welfare System (CWS). Age was examined as a potential moderator as different developmental stages pose distinct parenting challenges that may intersect with maternal trauma. Understanding the consequences of ACEs both as a result of cumulative burden and as intergenerational in their impact would have serious

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implications for policy and practice within child welfare. Along with extant research, if results of the present study indicate that mothers' experiences of early adversity have a detrimental effect on children's behavior, it would suggest the need for more universal screenings of ACEs for caregivers with open CWS cases, trauma-informed child welfare services at every point in the case, and relationship-based interventions when caregivers have experienced childhood adversity.

## 2. Theoretical framework

### 2.1. The impact of adverse childhood effects and toxic stress

Adverse childhood experiences have been linked with a wide range of physical and psychological consequences in adulthood, often with a cumulative effect where each additional ACE represents a higher likelihood of worse trajectories (Dube et al., 2003; Anda et al., 2006). Studies demonstrate robust associations between ACEs and the development of depressive disorders (Chapman et al., 2004), suicidality (Dube et al., 2001), alcohol or other substance use disorders (Anda et al., 2002; Dube et al., 2006; Dube, Anda, Felitti, Edwards, & Croft, 2002), obesity, smoking, heart disease, cancer, diabetes (Felitti, 1998), risk-taking behaviors, and even early death (Felitti, 1998; Brown et al., 2009). In short, adverse childhood experiences have the potential to affect many domains of one's life long after childhood has ended (Van Niel, Pachter, Wade Jr., Felitti, & Stein, 2014).

One potential pathway between exposure to adverse childhood experiences and the range of negative consequences outlined above is through the development of toxic stress, which results from “strong, frequent or prolonged activation of the body's stress response systems in the absence of the buffering protection of a supportive adult relationship” (Shonkoff et al., 2012a, b). When a child experiences a prolonged stress response, she experiences a state of sustained threat which alters brain architecture, potentially impairing cognitive, regulatory, and relational capacities (Center for the Developing Child at Harvard University, 2010). A dose-response effect exists with increasing number of ACEs making it more likely a child will experience toxic stress and its attendant harmful consequences that then shape adult capabilities (Felitti et al., 1998; Gilbert et al., 2015; Schilling, Aseltine, & Gore, 2007).

One key difference between stress that is tolerable and stress that is toxic is the degree to which a child has a safe, stable, and nurturing relationship with a primary caregiver to help buffer the impact of adversity (Shonkoff et al., 2012a, b; Shonkoff, Richter, et al., 2012b). Nurturing parent-child relationships are well established to be a key mechanism for children's healthy development and growth (Bates, Maslin, & Frankel, 1985; Crowell & Feldman, 1988). Conversely, parenting distress and problematic parenting behaviors are likely to impede the essential relational security that helps children weather even the most devastating adverse experiences (Lieberman, 2004). In and of themselves, relational impairments between caregivers and children can create the conditions for a child to experience toxic stress (Shonkoff et al., 2012a, b). Positive social supports or access to other adults like preschool teachers who offer high quality care can be protective, mitigating the impact of poor-quality parent-child relationships (Shonkoff et al., 2012a, b). When children lack access to these other forms of support, however, they are more likely to be vulnerable to the negative impacts of both vulnerable ecological conditions and poor-quality parent-child relationships.

### 2.2. ACEs, attachment theory and problematic parenting

Children with an open case in the child welfare system are, by definition, likely to be experiencing disturbances in child-caregiver relationships and challenging parenting behaviors. Research strongly connects caregivers' childhood adversity to later impairments in parenting (Lyons-Ruth & Block, 1996; Sroufe, 2005). Beginning with John

Bowlby, attachment theorists have recognized that there is an explicit connection between a parent's mental representation of relationships based on their past primary relationships and their representations, perceptions, attunement, and interactions with their own child (Bowlby, 1988; Fraiberg et al., 1975). Bowlby articulated that these mental representations serve as internal working models which have enormous generalizable and predictive power (Bowlby, 1969/1982, 1973, 1979, 1980, 1988). Fundamentally, internal working models are dynamic representations developed in the context of a transactional experience between a caregiver and a child about the safety and predictability of relationships, which in turn, shape a child's sense of self-worth (Bretherton, 1985; Sroufe & Waters, 1977). Caregivers who have a history of maltreatment are likely to have negative internal working models which impede their ability to provide children with “the average expectable environment” (Cicchetti & Valentino, 2006), which, in turn, likely influences child development.

Attachment styles reflect internal working models about relationships and can be characterized as secure, avoidant, ambivalent, or disorganized (Main, Goldwyn, & Hesse, 2002). Child maltreatment is firmly connected to all insecure attachment patterns (Raby, Labella, Martin, Carlson, & Roisman, 2017), as are other impairments in parenting and psychopathology in children and adults (Kessler et al., 2010; Steele et al., 2016).

Consistent with research on cumulative risk, the presence of higher levels of ACEs for a caregiver is predictive of greater likelihood of having a disorganized attachment style (Murphy et al., 2014). Steele et al. (2016) demonstrated that cumulative exposure to adverse childhood experiences is also associated with higher levels of parental distress, even when controlling for socio-economic status. Because childhood maltreatment is a risk factor for insecure attachment (Van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) and insecure attachment can contribute to disrupted parenting capacity (Hesse & Main, 2006), there is reason to believe that caregiver cumulative burden originating in childhood affects attachment style and parenting practices, which in turn shape children's psychological development. Few studies have investigated this intergenerational connection (Schickedanz, Halfon, Sastry, & Chung, 2018). These studies have found that higher levels of maternal ACEs were associated with increased risk of biomedical and psychosocial risk for mothers and their infants independent of socioeconomic status, as well as that higher ACE scores are associated with increased odds of children having poor health (LeScherban, Wang, Boyle-Steele, & Pachter, 2018; Madigan et al., 2017). Additionally, maternal ACEs have been associated with impairments in recognition of feeling states and emotion regulation, which in turn are associated with problematic parenting behaviors (Kolomeyer, Renk, Cunningham, Lowell, & Khan, 2016). These findings are suggestive that caregiver ACEs may have intergenerational consequences across developmental domains, however, the findings are restricted to the earliest period of development. This research fills a gap in current knowledge about the relationship between caregivers' experiences of childhood adversity and their children's externalizing and internalizing behaviors throughout childhood, providing support for our understanding of ACEs as intergenerational in nature. Moreover, this study examines the relationship between the accumulation of childhood adversity and intergenerational impact, moving a discussion of ACEs beyond a discussion of single risk factors or outcomes.

The current study is guided by two related research questions. First, we ask if caregiver exposure to ACEs is associated with internalizing and externalizing child behaviors in families receiving child welfare services while their child remains with them in their home. Only recently have researchers even begun to examine the potential impact of parental ACEs on child behaviors, and they have not considered child-welfare populations (Schickedanz et al., 2018). Here, we hypothesize that caregivers with higher ACE scores will have children with more behavioral difficulties. For our second research question, we incorporate a developmental perspective, considering the impact of ages

and stages when examining how earlier influences manifest in children's psychosocial functioning. We ask if the relationship between caregiver ACEs and child behavior is moderated by age among children with in-home involvement in the child welfare system. We hypothesize that the effect of caregiver ACE exposure on child behavior will be dependent on child age; we do not hypothesize as to whether the effect will become more or less apparent among older children compared to younger children.

### 3. Method

Within the context of a broader needs assessment for a populous, northeastern state, parents with in-home child welfare cases were surveyed by telephone in the fall of 2017. These parents had open, active cases with the state's public child welfare agency, and their child remained in the home, under their care. The survey aimed to elicit parents' perceptions of their needs across several domains, along with information about their use of any services in these areas. When the needs and services pertained to their child, parents of multiple children were directed to respond for a single target child identified in sampling. Trained interviewers employed by a university survey research institute administered the survey, which was designed to take approximately 30 min, using Computer Assisted Telephone Interviewing software (CATI). Parents who participated in the survey received a \$25 gift card of their choice from a small selection of online and brick-and-mortar retailers. This study was undertaken with the approval of the Institutional Review Board of the authors' institution.

#### 3.1. Sample

To be eligible for the survey, parents must have had an active, in-home case with the state's public child welfare agency at least two months before the survey period opened. The list of 10,207 eligible parents was extracted from the state administrative data, maintained in accordance with federal standards for statewide automated child welfare information systems (SACWIS). Although their cases may have involved more than one of their children, each parent was associated with a single target child who appeared only once in the sampling frame. For parents of multiple children, the target child was identified by selecting the sibling whose birthdate fell earliest in the month, regardless of month or year, to ensure the selection factor would not bias the sample toward younger or older children or introduce potential seasonal effects. In cases involving twins, the sibling whose name came first alphabetically was chosen. The primary caregiver for each target child, identified using the administrative data, was the parent listed in the sampling frame.

Participants were not informed about the survey before being contacted by interviewers. Over the phone, they were informed of the voluntary, confidential nature of the study and told that they would receive a \$25.00 gift card for their participation. Consent to participate was secured before the survey began and affirmed throughout the interview.

The order in which parents on the list were contacted was random, though quotas were employed to increase the likelihood that the distribution of participants across counties roughly matched that of the sampling frame. Of the 2221 caregivers who were successfully contacted by the survey team, 476 agreed to participate in the survey and provided complete or partial responses, yielding a response rate of 21%. While we are not aware of any published studies reporting response rates for telephone surveys of parents receiving in-home child welfare services, these rates aligned with our expectations, given that caregivers unsatisfied with child welfare services may be more likely to decline participation, or they may be more likely to participate to air their complaints; and that potential respondents may fear that their candid participation in surveys could negatively impact their cases (Alpert, 2005; Baker, 2007). Additionally, response rates for telephone surveys

in general have fallen precipitously in recent years, including for long-running standard political polls (Keeter, Hatley, Kennedy, & Lau, 2017). The survey sample did not differ significantly from the population in race or age of parents or children. A response rate of 21% was therefore considered to be quite adequate.

Only those respondents who completed at least half of the survey were included in the sample before further exclusion criteria were applied. Of the 391 caregivers who completed 50% or more of the survey, 259 were included in this study. To be included in the analysis, respondents must have responded to the ACE questionnaire, reported on at least one of the CBCL subscales, and provided complete data on all covariates. CBCL scales were only available for children at least 18-months-old. Caregivers responding to the survey with a target child less than 18-months-old were excluded from this analysis. One case was excluded because the reported number of children living in the household with the respondent was an extreme outlier. While the survey was open to biological caregivers receiving in-home child welfare services, an overwhelming majority of respondents were biological mothers. After applying exclusion criteria for the current study, the analytic sample contained only mothers.

#### 3.2. Measures

##### 3.2.1. Adverse childhood experiences

The survey included the Adverse Childhood Experience module from the Behavioral Risk Factor Surveillance System (CDC, n.d.), which includes 11 questions about events that happened to respondents before they were 12 years old. Of these questions, six relate to experiences of child maltreatment (i.e., physical, sexual, and emotional abuse), and the remaining five are associated with household dysfunction (i.e., living with someone who is mentally ill, living with someone who abuses drugs or alcohol, living with someone who was ever incarcerated, and parents' divorce or separation). These experiences, as well as their link with poor adult outcomes, are well catalogued in the literature (Dube et al., 2003; Anda et al., 2006) as described above. For each item, parents who experienced the event in question were given a score of one; those who did not experience the event were given a score of zero. Each parent's scores were summed across the eleven questions, for an ACE score ranging from zero to eleven (Cronbach's  $\alpha = 0.80$ ). Some researchers have collapsed certain ACE module items, resulting in a scale measuring eight, not eleven, ACEs. However, as each item in the questionnaire assesses a discrete experience or type of experience, including distinct types of sexual abuse, the authors of this study elected not to consolidate items.

##### 3.2.2. Children's behavioral and emotional functioning

The dependent variables in this study describe children's behavioral and emotional functioning, as measured by subscales of the Child Behavior Checklist (CBCL; Achenbach, 2009; Achenbach & Rescorla, 2001). The CBCL lists problematic behaviors and asks parents to indicate how well each item fits their child, using a scale ranging from 0 (not true) to 2 (very true or often true). The instrument was specific to the target child's age group; one tool was designated for parents of target children between the ages of 18 months and 5 years, and another tool was used with parents of target children older than 6 and younger than 18 years. To capture internalizing behaviors, the "Withdrawn" subscale was used for the younger children and the "Withdrawn/Depressed" subscale was used for the older children. Externalizing behaviors were gauged with the "Aggressive Behaviors" subscale on each CBCL. Within subscales, parents' scores were summed. For younger children (1.5–5 years), possible scores range from 0 to 16 (Cronbach's  $\alpha = 0.75$ ) on the internalizing behaviors subscale and 0–38 on the externalizing behaviors subscale (Cronbach's  $\alpha = 0.94$ ). The older group's possible scores range from 0 to 16 on the internalizing behaviors subscale (Cronbach's  $\alpha = 0.82$ ) and 0–36 on the externalizing behaviors subscale (Cronbach's  $\alpha = 0.94$ ). For the regression models,

all CBCL subscale sum scores were standardized. Both standardized internalizing subscales were pooled, as were both standardized externalizing subscales. Although CBCL subscales may be scored to categorize children into clinical and sub-clinical ranges, the analyses presented in this paper use the sum score to capture more variation in the population.

3.2.3. Covariates

Additional variables were included in the models to control for the effect of certain demographic factors that theory and extant literature suggest might influence the dependent variables, child problem behaviors. These include parents' age in years, child's age in years, and child's sex, either boy or girl. In the literature, both parent and child ages were associated with differences in child behaviors over time (Tearne et al., 2015). Overall child behaviors, as well as internalizing and externalizing behaviors, have been found to differ by child sex (Gerard & Buehler, 2004; Hunt, Slack, & Berger, 2017; Rescorla et al., 2007). Child race was also included, as differences in the association between cumulative risk and children's behaviors have been found to differ by children's race (Gerard & Buehler, 2004). In the survey, respondents were asked to indicate which racial groups they felt most closely described them from a list of 15 options. Given the sample size, cell sizes for most non-white respondent groups, even when condensed into fewer categories, were quite small. Therefore, for the current analyses, race was dichotomized into white and non-white categories to maximize interpretability of any difference in experience between the state's majority (white) and minority (non-white) populations. While this obscures potentially important differences between more discrete racial groups, a larger sample would be necessary to fully explore these distinctions. Studies have also indicated that internalizing and externalizing behaviors differ by the number of children living in the household, with internalizing behaviors being more associated with smaller families, and externalizing behaviors with larger families (Barnett & Hunter, 2012; Lawson & Mace, 2010). Survey respondents reported the number of children living in the household, and this was included in the regression models as a continuous measure. Whether the parent was partnered (married or in a committed relationship versus not) was also included, following recent scholarship finding that child behaviors differ by the type of parent relationship to which they are exposed (Hannighofer, Zimmermann, Foran, & Hahlweg, 2017). Finally, socioeconomic status has been well documented as having an association with child behaviors (Gonzalez, 2014; Hunt et al., 2017; Tearne et al., 2015), so an approximation of poverty status was included in the analyses. Caregivers were asked to provide their pre-tax income within \$5000 ranges listed. If the Federal Poverty Level for a caregiver's family size was below the upper limit of the range, the parent was considered to be living at or below poverty level.

3.3. Analysis

Both the standardized internalizing and the standardized externalizing subscales were treated as dependent variables. For each outcome, pairwise correlations among the independent variables, dependent variables, and covariates considered for inclusion were run to assess their relationships and deem their suitability for inclusion in the regression models. Next, each of the child behavior outcomes were regressed on ACEs scores without any additional control variables included to determine the variables' bivariate relationship. Finally, full OLS regression models were run to assess the relationship between parental ACEs and children's internalizing and externalizing behaviors, controlling for demographic factors listed above. To test the hypothesis that the relationship between caregiver ACEs and child behavior is dependent on child age, models interacting caregiver ACE score and child age were run for both the standardized internalizing and standardized externalizing behavior subscales. All analyses were performed using Stata (StataCorp, Version 15.1).

**Table 1**  
Descriptive information for the analytic sample (N = 259).

	Mean/percentage	Standard deviation
Parent's ACE score	2.95	2.93
Parent's age	33.59	7.36
Parent's race/ethnicity		
White	33.10%	
Non-White	66.90%	
Child sex		
Girl	51.60%	
Boy	48.40%	
Child age	7.90	4.75
Below poverty level	67.18%	
Partnered	34.75%	
Number of children in household	2.26	1.40

4. Results

4.1. Descriptive results

Descriptive results may be found in Table 1. Mothers included in the analytic sample reported an average of nearly three ACEs (m = 2.95, sd = 2.93). The distribution of ACEs experienced by mothers in the sample was positively skewed (Table 2). Respondents were majority non-white and had an average age of 33.59 years (standard deviation = 7.36). The mean age of their children was 7.90 years (standard deviation = 4.75), and there were an average of 2.26 children living in the household (standard deviation = 1.40). With over two-thirds of the sample (67.18%) living at or below the poverty level when the survey was administered, many of the mothers in this study are economically vulnerable. Just over one-third of the respondents reported that they are married or in a committed relationship.

Unstandardized externalizing behavior subscale scores averaged 9.06 points (standard deviation = 8.46) for children ages 1.5 to 5 and 7.63 points (standard deviation = 8.36) for children 6 and up. On the unstandardized internalizing subscales, younger children had an average score of 1.4 points (standard deviation = 2.18), and older children had an average score of 3.21 points (standard deviation = 3.4).

4.2. Regression results

Both regressions testing the relationship between parents' ACE exposure and their children's CBCL scores in absence of any other covariates revealed significant, positive associations (See Table 3). Controlling for no other factors, an increase of one caregiver ACE was associated with a moderate increase in both child externalizing (B = 0.10, p < .001) and internalizing behaviors (B = 0.10, p < .001) of one-tenth of a standard deviation, as measured by the CBCL.

**Table 2**  
Distribution of ACEs in the analytic sample.

# of ACEs	Frequency	Cumulative percent
0	48	18.53%
1	56	40.15%
2	27	50.58%
3	24	59.85%
4	31	71.81%
5	21	79.92%
6	12	84.56%
7	8	87.64%
8	13	92.66%
9	9	96.14%
10	7	98.84%
11	3	100.00%
Total	259	

**Table 3**  
Regression of parental ACE score on target child's CBCL subscale scores.

	Standardized CBCL Score							
	Internalizing Behavior				Externalizing Behavior			
	B		B		B		B	
Parent's ACE score	0.10	***	0.09	***	0.10	***	0.1	***
Parent's Age			0.01				−0.01	
Parent's race/ethnicity (ref. non-White)								
White			0.19				0.04	
Child SEX (ref. male)								
Girl			−0.20				−0.57	
Child's age (1.5–18 years)			0.01				0.00	
Below poverty level for family size			−0.03				0.07	
Parent's Relationship Status (ref. single)								
Married or in committed relationship			−0.32	*			−0.27	*
No. of Children in HH			0.09	*			0.053	
Constant	−0.31	***	−0.16		−0.33	***	−0.08	
R-squared or adjusted R-squared	0.08		0.10		0.09		0.09	

\*  $p < .05$ .

\*\*\*  $p < .001$ .

The significant, positive relationship between parental ACE exposure and child behavior persisted when the control variables were added to the models. The magnitude of the relationship was largely similar to that found in the uncontrolled regression models: a mother's exposure to an additional ACE was associated with modest increases on both the child externalizing and internalizing behavior subscales of 0.10 ( $p < .001$ ) and 0.09 ( $p < .001$ ) standard deviations, respectively (Table 3). No relationship between child age and child behavior subscale scores was observed in the fully-controlled models.

In this sample, it appears that being in married or committed relationships was somewhat protective for children's behavior, as previous studies suggest (Hannighofer et al., 2017). In both models, children of mothers who were married or in committed relationships had lower standardized scores on the externalizing and internalizing behavior subscales (aggressive:  $B = -0.27$ ,  $p < .05$ ; withdrawn:  $B = -0.32$ ,  $p < .05$ ). Meanwhile, living in a household with more children has an opposite effect on a child's internalizing behavior. Each additional child in the household was associated with a 0.09-standard deviation increase on the internalizing behavior subscale.

As a robustness check, additional variables were included in the fully-controlled models to test whether mother's depression or anxiety symptoms, measured using the 9-item Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) and the 7-item Generalized Anxiety Disorder instrument (Spitzer, Kroenke, Williams, & Lowe, 2006), respectively, might be influencing children's CBCL subscale scores (analyses available upon request). These variables were not significant in either of the models and did not increase their predictive power. The interacted models did not show a relationship between caregiver ACEs and child behavior dependent on child age (results are available upon request).

## 5. Discussion

This study examined the association between maternal adverse childhood experiences and children's problem behaviors in a sample of child welfare involved families. As hypothesized, higher numbers of ACEs experienced by caregivers were associated with greater behavioral difficulties in children. Specifically, every additional maternal exposure to an adverse childhood experience was related to higher ratings of difficulty in children's withdrawing and aggressing behaviors. Although research continues to find deleterious direct effects of ACEs on children, including behavior problems in early childhood (Jimenez, Wade Jr., Yong, Morrow, & Reichman, 2016), middle childhood (Hunt et al., 2017) and adolescence (Lucenko, Sharkova, Huber, Jemelka, &

Mancuso, 2015), little prior research has linked parental ACEs to children's behavioral problems across developmental stages. With age showing no interaction effect in these models, this research suggests an association between children's behavior and maternal ACEs across development. However, it should be noted that an interaction between child age and behavior, if there is one, may be masked by this sample's relatively small size. Also, while one might assume that mothers involved with CWS would have uniformly high levels of exposure to early adversity, examination of the data showed variation. In addition to contributing knowledge about the intergenerational impact of parental ACE exposure, this study also provides information about the prevalence of ACEs in a population receiving in-home child welfare services.

While the developmental mechanism(s) underlying the association between maternal ACEs and child outcomes remains to be fully understood and likely involves substantial continuity in risk across the lifespan in both environmental adversity and transactional family processes (Sameroff & MacKenzie, 2003), this research indicates that adversity affects individuals across the life-course and has the potential to influence the behaviors of other generations. As previously documented, the individual effects of adversity pervade personal development (Anda et al., 2006) influencing relational interactions such as parent-child relationship quality (Steele et al., 2016). Burgeoning research demonstrates the intergenerational transmission of child maltreatment is associated with mother-infant emotional availability (Fuchs, Möhler, Resch, & Kaess, 2015) and child maltreatment (Cort, Toth, Cerulli, & Rogosch, 2011), with recognition that parenting styles may develop from early experiences of maltreatment and influence parenting behaviors (Schwerdtfeger, Larzelere, Werner, Peters, & Oliver, 2013; Thomson & Jaque, 2017). These findings are consistent with the large body of literature on attachment styles which demonstrate a stable intergenerational effect (Fonagy & and, 1991; Fonagy, Gergely, & Target, 2007), providing a possible explanation for one pathway by which caregiver adversity impacts the next generation's behavioral outcomes. For example, mothers with maltreatment histories may have difficulties responding to their children's attachment needs, particularly when unresolved trauma exists, as it can have a negative impact on infant attachment disorganization (Berthelot et al., 2015).

Indeed, maternal ACEs have been associated with experiences of postpartum depression (Johnson et al., 2017) and the construction of parenting beliefs and behaviors (Bailey, DeOliveira, Wolfe, Evans, & Hartwick, 2012). It is likely that several pathways to transmission exist, but the presence of maternal ACEs as the impetus for indirect effects

still being identified. In a Canadian study of mother-infant dyads not involved in the CWS, maternal ACEs were associated with infant emotional and physical health problems through disparate risks, including biomedical, psychosocial, and behavioral risks (Madigan et al., 2017; Schickedanz et al., 2018). In another study, researchers identified that mothers' experiences of ACEs influenced their recognition of personal and child-related emotions which were then associated with negative parenting behaviors (Kolomeyer et al., 2016). These studies indicate the need for additional research to discern nuanced adverse events and their associated child-related effects. Further, while research examining the means for transmission risk may not show a direct effect of maternal ACEs to child outcomes, it does indicate that transmission of risk may be compounded by a mother's early experiences of adversity. Identification of adverse childhood histories in women planning families, expecting children, or caring for children thus presents critical opportunities for intervening to assess personal challenges and allay perpetuation of these risks to children. Cultural experiences and structural barriers should also be assessed as persons of color are the largest population in child welfare systems, suggesting a need to address stressors such as poverty and societal bias with culturally competent responses (Child Welfare Information Gateway, 2016).

Previous research has identified higher internalizing and externalizing behaviors among adolescents investigated for child maltreatment (Mills et al., 2013). Similarly, the current study finds that among a sample of children involved with the CWS, problematic internalizing or externalizing behaviors are observed. Although this study is limited to identifying an association between maternal ACEs and internalizing and externalizing behaviors, previous research suggests that child maltreatment in combination with other risks may exacerbate children's behavioral difficulties (MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011b). For families engaged with the CWS, recognition of a family's cumulative risks may be more important for understanding behavior problems than maltreatment alone (MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011b). As children transition from early childhood to middle-childhood and adolescence, those with higher total risks excluding maltreatment have demonstrated greater behavioral problems than those with lower total risks, including maltreatment (MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011b). Recognition of the cumulative ecological-transactional risk perspective necessitates identification of family environmental variables such as poverty, neighborhood conditions, and maternal history of maltreatment with appropriate interventions and supports in order to promote family well-being (MacKenzie, Kotch, & Lee, 2011a).

Previous research has found that the presence of a marriage or committed relationship positively influenced children's behaviors (Hannighofer et al., 2017). In this research, children coming from homes where mothers are married or in committed relationships demonstrated fewer externalizing or internalizing behaviors. A committed relationship may serve as a protective factor by modeling support, distributing family demands, and decreasing stressors. Further, parents with more supportive relationships have been linked to children displaying fewer difficulties (Goldberg & Carlson, 2014). However, the presence of additional children in a family was associated with moderately increased internalizing behaviors. Previous research has found conflicting results concerning the number of children in a family and children's behaviors. Some research has found that having more siblings was related to higher levels of externalizing behaviors (MacKenzie, Kotch, & Lee, 2011a, MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011b). Other research has found that fewer siblings in a family was predictive of internalizing disorders (Barnett & Hunter, 2012). Perhaps children's relationships with their siblings, personality traits, or family responses to aggression influence their display of depressed or anxious reactions to stressors. In families with more children, it may be more tolerable to withdraw from conflict than to act in a combative manner. With inconsistent findings, this leaves opportunities for future research to continue to examine how family size and parental relationship status

influence children's behaviors.

### 5.1. Limitations

This study has some limitations which should be considered. The sample represents a small group of individuals from a rather large system. The response rate for those individuals that could be contacted may be associated with the focus of the research, dissatisfaction, fear, or other circumstances that may have biased completion of the survey to those interested in sharing their experiences. As the survey was completed via phone call and relates to sensitive content, some social desirability bias may have limited some of the responses provided. The sample was entirely comprised of children placed in in-home child protective supervision, therefore it was not possible to compare child behavioral problems relative to their home environment. Additionally, while it is known that all of the children in the sample experienced a child maltreatment report, child maltreatment typology data was not available for inclusion in this study. As child maltreatment or other ACE experiences could serve as a major mechanism affecting children's behaviors, interpretation of the findings in this study should consider this limitation. Future research should examine child maltreatment types and severity relative to maternal ACEs and behavioral problems to examine the direct and indirect effects of parent and child ACEs on child behavior. Research should also consider how child placement may defuse or intensify these behaviors. Additionally, other factors not included in this study, such as unstable housing or homelessness, poverty, substance use, or the cumulative effects of other ecological risks could affect children's behaviors and should be explored in other research. While several mechanisms of risk transmission exist, it would be helpful to examine parenting practices and quality of relationships to fully assess how family connections influence internalizing and externalizing behaviors.

### 5.2. Implications

Several implications are derived from this study. First, maternal adversities, such as childhood ACEs, may create personal difficulties that influence children's behaviors. The results of this study may inform child welfare systems striving to eliminate, reduce, and buffer critical risk factors and maximize family preservation by encouraging assessment of a parent's most severe individual challenges. When parental trauma is indicated, child welfare systems have an opportunity to improve family functioning through a trauma-informed response. Trauma-informed responses focus on understanding current behavior as a consequence of past experiences. In particular, a trauma-informed practice approach requires that child-serving professionals have awareness of the neurobiological implications of trauma and the skills to assess its presence and then refer to evidence-based interventions for all affected family members. Such an approach would necessarily focus on relationship-based interventions for caregivers and their children, as well as interventions that promote the restoration of regulatory capacities. These kinds of interventions are inconsistent with psychoeducation or parenting classes that can often be a first-line treatment in child welfare services. Second, for those children in the CWS, a cumulative risk effect may exist that could potentially exacerbate problems whereby a mother's history of risks influences the child's risks with continuity in the experience of adversity across development. Identifying maternal symptoms related to ACE experiences and linking mothers to supportive services could help alleviate the source of risk transmission. Although depression and anxiety were not examined as personal sources of maternal struggle in this study, these and other individual concerns related to health, mental health, or interpersonal interaction could contribute to the parent-child relationship. Third, children may experience problematic behaviors related to maternal ACEs across development, though no significant interaction between mothers' exposure to early adversity and child age was identified in this study. Future research

should examine whether mothers' early adverse experiences manifest in children's psychosocial functioning in different ways depending on children's ages. Besides age, as considered in this study, the manifestation of behavior difficulties may be moderated by children's social supports or engagement in prosocial activities. Recognizing that maternal adversities can affect children over many years suggests that maternal barriers to well-being may not dissipate with time. Regardless of the age that children enter the child welfare system, it may be beneficial to consider parental symptoms of ACEs. Finally, family dynamics can influence the presentation of children's behavioral concerns as children with more behavioral symptoms were those with more siblings, and children with fewer symptoms were those whose mothers were in committed relationships. This suggests that interactions between caregivers and interactions between siblings can change expression of behavioral responses. Helping families to develop strong relationships and manage potentially divergent needs in families may reduce negative behavioral expression. It is also critical that systems of care respond to family dynamics that are influenced by the social-ecological ramifications of structural issues such as poverty, housing instability, and racial discrimination. In order to adequately improve family well-being, our systems must attend to the contexts that place families at risk by building communities where basic needs are met and healthy development is championed for all of its members. In this way, trauma-informed care and trauma-informed responses are intricately tied to the community level as well as individual forms of care.

## 6. Conclusion

The intergenerational transmission of risk is observed in the maltreatment of current generations of children and in the behavioral actions of those children. It will be important in future work to more fully integrate the to-date disparate and parallel literatures on cumulative risk in psychology and the ACEs literature in public health and medicine. The lack of inclusion of concurrent environmental adversity metrics in much of the temporally distal ACEs risk literature can lead to assumptions of linear main effects from childhood ACEs to later outcomes, without taking into account what we know about strong continuities in cumulative risk and transactional relationship processes across the life course. Regardless of age, children's problem behaviors are associated with parental experiences of adversity. Risk is not alleviated by time alone and may be exacerbated by failure to curtail those risks early, leading to greater individual and interpersonal consequences. Identifying risks and the associated symptoms of risk, whether poor individual functioning or challenging parenting practices, presents opportunities for augmenting family capacities with additional strengths. Moreover, the transmission of trauma from parent to child demands that we recognize the conditions that persist in inflicting adversity on vulnerable families and respond with efforts to improve environmental circumstances so that families can thrive.

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