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Resilience in Young Children Involved with Child Protective Services

Kierra M.P. Sattler and **Sarah Font**[1]

The University of Texas at Austin, 108 E. Dean Keeton St., Stop A2702, Austin, TX 78712

Abstract

Child maltreatment increases the risk of poor developmental outcomes. However, some children display resilience, meaning they are high-functioning despite their adverse experiences. To date, few research studies have examined protective factors among very young maltreated children. Yet, levels of resilience, and the protective factors that promote resilience among maltreated children, are likely to differ by developmental stage. Drawing on ecological systems theory and life course theory, we examined how protective factors at multiple ecological levels across early childhood were related to social and cognitive resilience among very young children involved with Child Protective Services. The results demonstrated that the buffering effects of protective factors varied by social or cognitive resilience and the cumulative effects of protective factors were more consistently related to later resilience than protective factors at specific time points. In addition, the influence of specific protective factors on resilience slightly varied by initial in-home or out-of-home placement. These findings have important policy and research implications for promoting optimal development among children involved in child protective services.

Keywords

Resilience; protective factors; child maltreatment

In 2015, Child Protective Services (CPS) investigated allegations of maltreatment involving over 3 million children (U.S. Department of Health and Human Services, 2017). CPS-involved children are at significant risk of adverse developmental outcomes, irrespective of whether there was sufficient evidence to substantiate them as victims of child maltreatment (Hussey et al., 2005). Young children are particularly vulnerable: 6.8% of U.S. children under 1 year of age were the subject of a CPS investigation in 2014, compared with 4.3% of U.S. children overall (U.S. Department of Health and Human Services, 2015). Although recognition of these negative impacts has rightfully made child maltreatment prevention a top priority among researchers and governmental and advocacy groups (Zimmerman & Mercy 2010), we must also identify factors that promote resilience among children who have already been victimized or exposed to serious risk.

[1]Present address: The Pennsylvania State University, 505 Oswald Tower University Park, PA 16802

Resilience, which refers to positive adaptation to adverse circumstances, is understudied among children at risk of or exposed to maltreatment. Despite that the first few years of life are when children are at the highest risk of maltreatment (Wildeman et al., 2014), factors promoting resilience among very young maltreated children are not well-identified (Cicchetti, 2013; Klika & Herrenkohl, 2013). Resilience during early childhood is likely to promote continued positive development. Indeed, children's school readiness and performance during their early years of schooling are predictive of later academic achievement (Duncan & Magnuson, 2011). In this study, we used ecological systems theory (Bronfenbrenner, 1994) and life course theory (Elder, 1998) to investigate whether children's emotional regulation abilities (self-regulation and easy temperament), parenting behavior (cognitive stimulation and emotional support), and neighborhood cohesion operate as protective factors for CPS-involved children. Specifically, we examined how early temperament and regulation abilities, parenting behavior, and neighborhood quality across early childhood, were associated with cognitive, social, and multi-domain resilience at school entry among children involved with CPS prior to age 1. Using a nationally representative sample of CPS investigations, we address three research questions: (1) What protective factors across early childhood promote resilience at school entry among CPS-involved children?; (2) Does the timing, accumulation, and inconsistency of parenting and neighborhood protective factors matter for resilience?; and (3) Are the benefits of parenting and neighborhood protective factors equivalent for children who remained in the home as compared with children initially placed outside the home?

Literature Review

Identifying Resilience

Generally defined, resilience is a dynamic process of positive adaptation following the presence of a significant risk (Luthar et al., 2000). Positive adaptation is generally defined in one of three ways: (1) avoiding psychopathology (Tiet et al., 1998), (2) outperforming peers in similar risky environments (Rutter, 2006), or (3) displaying competence in normative developmental tasks (meaning performing better than peers in non-risky environments; Masten, 2001). In studies of maltreatment, it is common to measure resilience as being at or above normative developmental standards (Jaffee and Gallop, 2007). By this standard, it was estimated that anywhere from 37% to 49% of children, aged 8 to 16 years, displayed resilience in either social skills or school achievement (Jaffee and Gallop, 2007). In this study, we focused on normative development as a marker of resilience.

Children may perform differently across developmental domains (e.g., social, emotional, academic, health), and studies vary as to whether, to be identified as resilient, a child must show positive adaptation in a single domain or multiple domains (Luthar et al., 2000). Among maltreated children ages 8 to 10, the rate of resilience was found to vary from 63% to 88% depending on whether the focus was academic, behavior, or social competence (Walsh, Dawson and Mattingly, 2010). Children were found to be less resilient when using multiple domains than any single domain (27% versus 45%; Walsh et al., 2010). Although these studies demonstrate that resilience varies based on developmental domains, there is still little research on resilience among young children who experience maltreatment. Thus,

we examined cognitive and social resilience separately, as well as, displaying resilience in both domains (hereafter referred to as “multi-domain resilience”) in a sample of children observed prior to one year of age through school entry.

Protective Factors

To improve the prospects of children exposed to maltreatment, it is important to identify factors associated with healthy development among high-risk children. Protective factors can moderate the effects of different risks and are positively associated with better developmental outcomes among children exposed to various risk environments (Luthar, Crossman, & Small, 2015). Protective factors can be found at the individual, family, and community levels (Luthar, Crossman, & Small, 2015). Bronfenbrenner’s (1994) ecological systems theory posits that a person develops within a set of nested environments and multiple ecological levels influence an individual’s development both directly and through interactions among ecological levels. By using an ecological systems framework to study resilience, it can be expected that that protective factors at multiple ecological levels might promote resilience.

Individual-level protective factors—Several individual-level protective factors have been shown to promote positive development following maltreatment, such as ego resiliency or self-efficacy (Afifi & MacMillan, 2011; Cicchetti, 2013). However, a much larger body of research has focused on protective factors for older children, rather than younger children, who have experienced maltreatment. An extensive body of research has identified easy temperament and self-regulation as protective factors for maltreated children (Afifi & Macmillan, 2011; Werner, 1992; Zolkoski & Bullock, 2012). Easy temperament might contribute to positive development by eliciting positive attention from family and others (Werner, 1992), thereby increasing the likelihood of receiving help following maltreatment or receiving positive support from non-offending caretakers concurrent with the maltreatment exposure. Children with easy temperament also tend to be less reactive to stressors and to use more flexible coping strategies (Compas, Connor-Smith, & Jaser, 2004). Self-regulation is the ability to control, or regulate, one’s emotional and behavioral responses following a stressor (Eisenberg et al., 2010). Self-regulation, such as self-soothing behaviors in infants, could help children navigate stressful situations (Eisenberg et al., 2010). Higher self-regulation was shown to be a protective factor among children, aged 8 to 18 years, living in low-income households and was associated with better social and academic outcomes (Buckner et al., 2009). Effortful control, a voluntary aspect of self-regulation, has also been cited as being protective among homeless children (Obradović, 2010). Although self-regulation is often considered a malleable skill, aspects of self-regulatory ability are static; for example, behavioral inhibition is stabilized by 1 year of age (Hoyle, 2006). Thus, we focused on early self-regulation (prior to 1 year of age) as a potential protective factor.

Family-level protective factors—Children who receive nurturing and cognitively stimulating parenting are better positioned for normative development (Afifi & Macmillan, 2011). Receiving nurturance from a caregiver has been found to be beneficial for children’s development regardless of risk; however, maltreated children may benefit from high-quality parenting differently. Prior research has shown that children who received inadequate

nurturing exhibit weakened responses to familiar persons and pleasant experiences (Fries, Ziegler, Kurian, Jacoris, & Pollak, 2005). Thus, maltreated children may require higher levels of, or more consistent, parenting than children who have not experienced maltreatment. One study found that, among CPS-involved infants with increased neurodevelopmental risk, sensitive and stimulating caregiving was associated with better cognitive and behavioral outcomes (Jaffee, 2007). Harden and Whittaker (2011) found that cognitive stimulation and emotional support were related to better outcomes (e.g. cognitive and language development, behavior problems, and social skills) for young children involved in child welfare services at different points in time. Notably, prior research does suggest that nurturing parenting benefits maltreated children, particularly if the nurturance is from a non-offending caregiver (Rosenthal et al, 2003). This raises the question of whether, and how much, nurturing displays of parenting from a previously abusive or neglectful parent will benefit children's development.

Community-level protective factors—Although little research has focused on protective factors at the community level after maltreatment (Afifi & Macmillan, 2011), residing in a high-quality neighborhood may promote positive development. Neighborhood quality, such as social cohesion, could be a proxy of available support and resources which would be advantageous in promoting positive development. Indeed, neighborhood quality is protective against other risks, such as discrimination and living in low-income households (Tran, 2015; Vanderbilt-Adriance et al., 2015), and neighborhood social cohesion has been found to be protective among children aged five years-old who experienced maltreatment (Jaffee et al., 2007). Furthermore, neighborhood quality, including social cohesion and informal social control (the extent to which neighbors are perceived to share norms around children and parenting), may reduce the risk of ongoing maltreatment (Maguire-Jack & Font, 2016; Kim & Maguire-Jack, 2015). Lastly, higher quality neighborhoods may provide access to high-quality child care or early education programs that help to prepare children for school entry.

Timing, cumulative effects, and consistency of protective factors—Much remains unknown about whether the timing, accumulation, or consistency of protective factors is most pertinent for resilience (Luthar et al., 2000). Life course theory (Elder, 1998) guided our research questions, specifically the concepts of timing and developmental pathways. Timing refers to the proposition that the developmental impact of an event depends on its timing in the life course, and the concept of developmental pathways emphasizes that earlier childhood experiences influence later development (Elder, 1998). Thus the aim of the current study was to investigate how protective factors at different ecological levels (caregiver-provided emotional support and cognitive stimulation, and neighborhood quality) at different time points relate to children's resilience and how the accumulation and consistency of protective factors across time relate to later resilience. The timing of protective factors, concurrently and following risk may be influential for children's later outcomes. For example, it could be more important to have a highly stimulating environment or nurturing parenting earlier in development and closer to risk exposure. Alternatively, the timing of protective factors may matter less than the accumulation and consistency of protective factors across childhood. In other words, is a child who receives

consistent but average nurturance more likely to be resilient than a child receiving high-quality nurturance at some stages and low-quality at others? One study demonstrated that compared with higher income families, children who experienced engaging and positive interactions with their mothers were more likely to benefit in concurrent and future development (Gutman & Feinstein, 2010). Another study demonstrated that consistently positive parenting, rather than positive parenting at any specific time point, was most protective for low-birthweight children (Landry et al., 2006). Few studies have examined the cumulative effect of protective factors, but previous research has demonstrated that having types of more protective factors is predictive of children's positive outcomes in varied risk environments (Evans et al., 2010; Turner et al., 2007).

Resilience in out-of-home care—Protective factors might also function differently for children who remain at home after experiencing maltreatment compared with children who are placed in out-of-home care (OHC). Children placed in OHC likely experienced more severe abuse and inadequate care (prior to placement) as compared with children who remained in home. Their exposure to more severe risk factors may be particularly detrimental for the development of secure attachment, which according to attachment theory is an important factor for normative development (Sroufe, 2005). Children's attachment is based on the caregiver's responsiveness when children are distressed and this interaction leads to secure, insecure, or disorganized attachments (Main & Solomon, 1990). Children who experience maltreatment are less likely to form secure attachments and more likely to display disorganized attachments compared to non-maltreated children and children in high-risk environments (Cyr et al., 2010; Cicchetti et al., 2006). Disorganized attachment is characterized by caregivers who display fearful behavior and children both trying to be comforted by their caregiver but also wanting to escape their caregiver's fearful behavior, which leads to a dissociative state (Sroufe, 2005). Disorganized attachment has been linked to later negative outcomes, such as dissociative tendencies and conduct disorder (Sroufe, 2005). Yet, when children enter foster care there is the opportunity to form a new attachment relationship and possibly develop a secure attachment to their new caregiver. Several studies have illustrated that children are able to form secure attachments to foster parents (Ponciano, 2010; Stovall-McClough & Dozier, 2004). Thus, children who are placed in foster care have the opportunity to develop secure attachments and subsequent protective factors, such as parental cognitive stimulation or emotional support, might be especially beneficial compared to children who remain in-home with the caregiver who perpetrated the maltreatment. For the current study, we replicated our models separately for children who remained in home and children who were placed in out-of-home care to examine potentially differential effects of protective factors on resilience.

The Current Study

Due to the lack of research on protective factors and resilience among young children involved with CPS (Cicchetti, 2013; Klika & Herrenkohl, 2013), our study focused on three research questions. First, which protective factors across early childhood promote cognitive, social, and multi-domain resilience at school entry? Second, does the timing, accumulation, and inconsistency of parenting and neighborhood protective factors matter for resilience? According to life course theory and social ecological systems theory, the buffering effects of

protective factors across early childhood should vary based on timing and their ecological level. Third, do the benefits of parenting and neighborhood protective factors differ for children initially placed out-of-home compared to children placed in-home? According to attachment theory and ecological system theory, the caregiver-child relationship and the context of the home environment should influence the association between protective factors and resilience.

Methods

Data and Sample

We used data from the first National Survey of Child and Adolescent Wellbeing (NSCAW I). NSCAW I is a nationally representative, longitudinal sample of 5,501 children aged 0 to 14 years involved in child protective services investigations. Initial data collection began in 1999 and there were 4 complete waves of data collection available (Waves 1, 3, 4, and 5). Additional information on sampling and study design are available in Dowd et al. (2002). For the purposes of the current study, we restricted the sample to children no older than 12 months at Wave 1, which resulted in the final wave of assessment aligning with children's school readiness. This was done because there is limited research on resilience among children who experienced maltreatment before entering school and school readiness is important for long-term academic outcomes (Duncan et al., 2007). This resulted in a final analytic sample of 1,193 children. Family- and neighborhood-level protective factors were measured at waves 1, 3, 4, and 5 and social and cognitive resilience were measured at wave 5.

Outcome Measures

Social resilience—Resilience was based on social-emotional and cognitive domains of development at the final wave of assessment, when children were about 5 years old. For the social-emotional domain, scores were derived from the Social Skills Rating System (SSRS; Gresham & Elliot, 1990). Caregivers used a 1(never) to 3 (very often) scale to measure children's social behaviors, such as "How often does [CHILD] follow your instructions?" and "How often does [CHILD] volunteer to help family members with tasks?" The SSRS has demonstrated high reliability (α = .73–95). To be considered socially resilient, children must have an average or higher score on the SSRS at wave 5 and was coded as (0) not resilient or (1) resilient. The SSRS was chosen as a measure of social resilience because it has been normed on a general population sample, thus allowing us to clearly compare our sample with a typical child. In addition, the SSRS specifically measured prosocial behaviors, which are considered to be learned and malleable. In contrast, other measures that relate more generally to socialization may reflect personality traits, such as introversion.

Cognitive resilience—The cognitive domain was based on scores from the Kaufman Brief Intelligence Test for children 4 or older at wave 5, which was administered by an interviewer (K-BIT; Kaufman & Kaufman, 1990). The K-BIT includes tests on children's vocabulary (e.g. expressive vocabulary and definitions) and matrices (ability to perceive relationships and complete analogies) to create an overall IQ composite. The K-BIT has high reliability for the IQ composite (median α =.93). For children to be considered cognitively

resilient they must have scored at or above the normative mean for the K-BIT (100). Cognitive resilience at wave 5 was coded as (0) not resilient or (1) resilient. We chose the K-BIT in part because, as with the SSRS, it allowed for direct comparison with the typical child, providing a clear threshold for normative development. In addition, many other measures of cognitive development were only used within narrow age ranges, whereas the K-BIT was available for all children over the age of four years.

Baseline Explanatory Measures

Easy Temperament and Self-Regulation—Measures of children's easy temperament and self-regulation were derived from the set of Emotion Regulation – Temperament subscales (Baker, Keck, Mott, Quinlan, 1993). Temperament was measured using the Positive Affect subscale, which was composed of 6 items, 3 for children aged 0–11 months and 3 items for children aged 12–23 months. Caregivers rated the tendency of a child to exhibit a certain behavior (e.g. when you play with CHILD, how often does he/she smile or laugh?) based on a 1 (Almost Never) to 5 (Almost Always) scale. Children's self-regulation was assessed based the Friendliness subscale, which included 8 items (Baker, Keck, Mott, Quinlan, 1993). Although termed "friendliness", on the items contained in the subscale were conceptually related to self-regulation. Specifically, the friendliness scale had caregivers rate the tendency of their child to display certain behaviors (e.g. be upset by loud sound) compared to others on a scale of 1 (Almost Never) to 5 (Almost Always). Items were reverse coded such that a higher score indicated more self-regulation.

Time-Varying Explanatory Measures

We focused on caregiver-provided emotional support and cognitive stimulation, and neighborhood quality. Each of these three constructs was measured using a validated scale described below. For each construct, we created the following variables: (1) a *time-specific* composite measure for each of the four waves (W1, W3, W4 and W5); (2) a *cumulative* measure that was equal to the sum of the unstandardized composites across all four waves; and (3) a child-specific *inconsistency* measure that was equal to the standard deviation of the child's average score across all four waves (i.e., the average difference between a child's at cognitive stimulation each wave as compared with the mean of child's cognitive stimulation across waves). The wave-specific composite measures and the cumulative measures were standardized to have a mean of 0 and standard deviation of 1.

Caregiver-provided emotional support and cognitive stimulation—The Home Observation for Measurement of the Environment-Short Form (HOME-SF) assessed the quality and quantity of support and stimulation in the home environment for children under 10 years old (Bradley et al., 2001). The HOME-SF is a widely-used measure of the caregiving environment and was the only measure related to parenting behaviors for young children that was available irrespective of a child's living arrangement (i.e., other measures focused on maltreatment-related behaviors were only asked when children were not in foster care). The two subscales, emotional support and cognitive stimulation, were based on a combination of interviewer observations and caregiver-reported questions. Interviewers noted whether different aspects of the physical environment (e.g., interesting activities or safe place to play) existed, do not exist, or were not observed and the children's current

caregivers answered questions about their caregiving and the home environment (e.g., “How often do you get a chance to read stories to CHILD?”). The emotional support subscale had 9 items for children 2 years or younger and 12 items for children aged 3 to 5 years. The subscale included questions about caregiver responses to children’s behaviors (e.g., had to spank in past week) and observed physical affection (e.g., kissed or hugged child). The cognitive stimulation subscale had 9 items for children under 2 years and 14 items for children between 3 to 5 years old. The cognitive stimulation subscale included caregiver reports and interviewer observation on available stimulating materials (e.g., caregiver provided interesting materials) and the physical environment (e.g., if there are safe play spaces).

Neighborhood quality—Community environment was measured by the Abridged Community Environment Scale (Furstenberg, 1993), which included nine items on quality of life and perceived neighborhood safety. NSCAW used four of the nine items to assess neighborhood quality. The child’s primary caregiver at the time of the interview responded to four items that assess neighborhood quality (e.g. “neighbors that help each other”). These items were measured on a three-point scale from “neighborhood is better than most” to “neighborhood is worse than most”. The scale items were reverse coded, such that a higher score indicated a higher-quality, and then summed to create a composite measure of neighborhood quality (α = .86)

Covariates

The current study controlled for several child demographic characteristics: race and ethnicity (Black, Hispanic, Native American, or White/other), age in months, and sex. Child neurodevelopmental risk was assessed by the Bayley Infant Neurodevelopmental Screener (BINS; Aylward, 1995). The BINS measured children’s basic neurological, receptive, expressive, and cognitive functioning and has high reliability (α = .73–.85). We also included binary indicators of baseline (Wave 1) living arrangement: biological family, non-relative foster care, living with a relative, or other. We accounted for instability in living arrangement with a variable equal to the number of waves at which the child’s caregiver differed from the previous wave. Our caregiver-related covariates were measured at baseline and were: education (beyond high school), marital status (married=1; else=0), mental well-being, and an indicator of whether the child’s household received benefits from the Supplemental Nutrition Assistance Program (food stamps).

Analytic Approach

All analyses were conducted with Stata 14. Missing data were imputed using multivariate normal imputation. Missing values were imputed separately by initial placement (with biological parent or not) and 200 imputed data sets were created for each group. We used logistic regression models for all analyses. All models included the covariates described earlier (baseline demographics and caregiver attributes) and sampling weights.

We specifically estimated four sets of models. First, in order to examine how the timing of protective factors related to children’s resilience, we regressed resilience (social, cognitive, and combined type) at W5 on protective factors at W1, W3, W4, and W5. Second, to

examine how the total amounts of select protective factors across time were associated with the probabilities of displaying social or cognitive resilience, we regressed resilience on standardized cumulative measures of each time-varying protective factor (cognitive stimulation, emotional support, and neighborhood quality). Third, we regressed resilience on the cumulative measures and the inconsistency measures. After estimating those sets of models, we calculated the predicted probabilities of resilience at specific values of our time-vary protective factors. Lastly, we replicated our models separately by initial placement (with biological parents or otherwise).

Results

Sample Description

A sample description is shown in Table 1. The mean age at W1 for our sample was 7.11 months. The sample was racially diverse, with 46% White, 32% Black, 18% Latino, and 4% Native American. About 70% of children were residing with their biological parents at baseline and the remainder were primarily in non-relative foster care (14%) or living with a relative (12%). The children's baseline caregivers were mostly low-education and unmarried, and approximately 1/3 were receiving food stamps.

Predictors of Resilience

The results of models predicting the probability of social, cognitive, and multi-domain resilience are found in Table 2. Models included all covariates described in the methods section as well as sampling weights. The first set of models (M1) focused on the timing of protective factors. Cognitive stimulation at W3 and W4 (when children were approximately 3 to 4 years old) was associated with increased odds of social resilience. Cognitive stimulation at W4 was associated with cognitive resilience, whereas W5 cognitive stimulation was associated with multi-domain resilience. Emotional support at W5 was associated with social resilience, but at no individual wave was emotional support predictive of cognitive or multi-domain resilience. Neighborhood quality was not associated with resilience.

The second set of models (M2) examined cumulative amounts of protective factors. Cumulative cognitive stimulation was predictive of resilience. A 1 standard deviation (SD) increase in cumulative cognitive stimulation was associated with a 1.8, 1.5, and 1.7 times increase in the odds of social, cognitive, and multi-domain resilience, respectively. Cumulative emotional support was not associated with social resilience, but was associated with a 1.5 times increase in the odds of cognitive resilience, and a 1.4 times increase in the odds of multi-domain resilience. Cumulative neighborhood quality was not predictive of resilience.

The third set of models (M3) focused on inconsistency in protective factors. We found that increased variation in cognitive stimulation was associated with decreased odds of social resilience, and increased variation in emotional support was associated with decreased odds of cognitive and (marginally) multi-domain resilience. The last set of models included both the cumulative and inconsistency measures. Once accounting for cumulative amount of

protective factors, inconsistency was no longer significantly predictive of resilience in any domain.

Across models, we found some evidence that self-regulation promoted social and multi-domain resilience. However, the coefficients were generally only marginally significant ($p<.1$). In none of the models was easy temperament associated with resilience.

Predicted Probabilities of Resilience at Specified Levels of Protective Factors

Table 3 shows the predicted probabilities of social, cognitive and multi-domain resilience at specific values of our explanatory variables, with no changes to any covariates. Because inconsistency was not a significant predictor of resilience after including cumulative amounts of protective factors, we only estimated predicted probabilities for the timing effects (M1) and cumulative effects (M2) models. As observed, 38% of the sample exhibited social resilience, 25% cognitive resilience, and 11% multi-domain resilience. Our predicted probabilities provide additional context to the results in Table 2. We found that, were children to have received above-average (1 SD above the sample mean) levels of cognitive stimulation, emotional support, and neighborhood quality early on (waves 1 and 3) and below-average (1 SD below the mean) levels at waves 4 and 5, predicted rates of resilience would be *lower* than those for children receiving average (mean) levels at all waves. To the contrary, were children to have low quality environments early on and higher quality environments closer to school entry, resilience would be higher than children receiving consistently average parenting.

Our predicted probabilities also indicated that cognitive stimulation was key to promoting resilience. According to our estimates, if children received above-average cognitive stimulation at all waves, 57% would display social resilience, 36% cognitive resilience, and 18% multi-domain resilience. Above-average emotional support would have made a smaller difference.

Differences by Initial Placement

Sub-group models by initial placement (with or apart from biological parent) are shown in Table 4. Overall, there were relatively few differences by initial setting. Of note, emotional support was more consistently associated with social resilience among children living apart from their biological parents than children residing in home. Specifically, whereas a 1 SD increase in cumulative emotional support predicted a 67% increase in the odds of social resilience among those initially placed out of the home, the association was non-significant and negative for children living at home. Notably, although cognitive stimulation was strongly and consistently associated with all forms of resilience among children initially living at home but not children living out of home, the coefficients were generally not significantly different.

Discussion

Although maltreatment is associated with negative social-emotional, behavioral, and cognitive outcomes (English et al., 2005; Mills et al., 2011), some children display resilience. Previous research has demonstrated that individual and family protective factors

are beneficial for older children who have experienced maltreatment (Afifi & Macmillan, 2011); however there is little information on factors promoting resilience among very young maltreated children (Cicchetti, 2013; Klika & Herrenkohl, 2013). Thus, the current study extended this work by demonstrating that some protective factors are more beneficial for certain domains of resilience, and that their importance may depend on where children are placed.

We found relatively little evidence that the timing of protective factors was important for resilience. Rather the cumulative amount of family-level (e.g. cognitive stimulation and emotional support) protective factors seemed to be consistently linked with later resilience and this is supported by previous research on non-maltreated populations (Landry et al., 2006). Specifically, cumulative cognitive stimulation was associated with social, cognitive and multi-domain resilience, and cumulative emotional support was associated with cognitive and (marginally) multi-domain resilience. According to ecological systems theory, interactions between the individual and their environment over time shape development and therefore overall cognitive stimulation would promote continued positive development. This theory also help to explain the association between emotional support and cognitive resilience. Future studies should continue to explore how protective factors at multiple ecological levels relate to different domains of resilience and how protective factors at specific times relate to later resilience.

Notably, there was no evidence that neighborhood quality was associated with resilience. Caregivers may not accurately report on their neighborhoods, or perhaps the aspects of quality included in our measure are not related to child outcomes. Alternatively, given the little empirical evidence on how neighborhood quality influences resilience among children involved in CPS, it is possible that neighborhoods do not have the same impacts for maltreated children as found for children generally.

Initial models indicated that high inconsistency was associated with reduced odds of resilience, but these associations were non-significant when the model included cumulative amount and inconsistency. This finding was conflicting with the general consensus that inconsistency is harmful. One potential explanation for these results is data was collected about 18 months between waves and inconsistent levels of protective factors might be more influential when measured on a smaller scale. According to attachment theory, consistent and appropriate caregiving responses are needed to help form secure attachment and promote positive social development (Sroufe, 2005). However, attachment is usually formed within the first two years and therefore, consistency would be measured at almost each distressing situation. Future research should continue to investigate how inconsistent levels of protective factors across time relate to resilience among children who experience maltreatment.

We found only one notable difference by initial placement. Early and overall emotional support was strongly related to social resilience among children in out-of-home care, but unrelated to social resilience for children in home. Drawing on attachment theory, it may be that children in out-of-home care need immediate and highly supportive caregiving interactions to form new attachment relationships, which have been linked to social

development (Sroufe, 2005). In addition, the primary caregiver for many children in the in-home group was the perpetrator of maltreatment. Children may respond more tentatively or fearfully to caregivers who previously maltreated them, even if no additional maltreatment occurs. The provision of emotional support from a maltreating caregiver may not be experienced as positively by the child, and not buffer the experience of maltreatment.

Several limitations should be taken into account when considering these results. First, this study lacked a comparison group of children who did not experience maltreatment, thus it is difficult to evaluate whether there are differences between maltreated and non-maltreated children in how little or how much they benefit from specific environmental factors. Future studies should include children who are not at risk of maltreatment in order to find protective factors that uniquely help children who have experienced maltreatment. Second, caregivers were the source of information for both the protective factors and for social resilience. Caregivers may overstate or misrepresent their provision of emotional support and cognitive stimulation. To the extent that caregivers overstate the quality of their caregiving behaviors, the results may be downwardly biased. At the same time, using caregiver report for explanatory and outcome variables may also result in inflated correlations (Paulhus & Vazire, 2007). Future studies should incorporate the use of multiple informants when assessing resilience. Despite these limitations, this study significantly contributed to our understanding of resilience among young children who have experienced maltreatment.

Turning to implications for child welfare practice and policy implications, our findings suggest that teaching parents to provide cognitive stimulation, and to a lesser extent, emotional support, could promote positive outcomes among children who experienced maltreatment; however, emotional support may be particularly beneficial for children placed out-of-home. Yet, average levels of cognitive stimulation and emotional support were insufficient to produce normative development overall. That is, probabilities of normative development were far below .5 for children receiving average levels of protective factors, and only at above-average levels did our sample approach the .5 threshold. This indicates that at-risk children may need especially high levels of parenting quality to overcome the risks that they experience. Currently, home visiting programs and parent training programs are the most common types of secondary prevention programs that focus on parenting behaviors, and several evidence-based program models exist (Berger & Font, 2015). Both home visiting programs, such as the nurse-family partnership (Olds, 2006), and parent training programs, such as the Incredible Years Parenting Series (Webster-Stratton & Taylor, 2001), target parents of very young children and are associated with improved positive parenting behaviors (Berger & Font, 2015). Yet, those programs, as well as many others, provide time-limited services and are underutilized due to cost and implementation barriers (Berger & Font, 2015). CPS agencies, in many cases, do not provide such intensive services, particularly if the presenting allegations were unsubstantiated.

Moreover, when children are placed outside the home, they may reside with foster parents who received little training. Foster parent training requirements and content vary significantly across states, and kinship caregivers are often not required to complete training at all (Child Welfare Information Gateway, 2014). States can do more to ensure that children are placed with caregivers who are well-suited to provide an optimally supportive and

stimulating environment. Although some evidence suggests foster parenting training is effective (Soloman et al., 2016), few evaluations have been rigorous or long-term (Rork & McNeil, 2011; Festinger & Baker 2013). In addition, some pre-service training programs focus nearly exclusively on procedural or role-related issues (e.g., orienting foster parent to the child welfare system, working with birth parents), rather than on skill acquisition or development (Benesh & Cui, 2015). Although foster parents require training that covers more complex issues (e.g., traumatic stress), it cannot be taken for granted that foster parents have already mastered basic parenting skills. It may be advisable to include more skill-based learning in pre-service foster parent training, and to require training for all foster parents, regardless of kinship status. Based on our results that parenting behaviors across early childhood were important for resilience, it would be most beneficial for parent programs to expand across several years and provide support to both parents and foster parents.

Lastly, we cannot say for certain whether child characteristics like temperament and self-regulation are protective because they enable children's development directly, or because children with positive affective responses are more likely to elicit caregiver investment and attention. However, to the extent that children's affective traits may influence caregiving responses (Belsky 1984), parent training programs that emphasize responses to children who display difficult emotional regulation or temperaments may be particularly advantageous.

In conclusion, children with very early involvement with CPS underperform on cognitive and social indicators at school entry, irrespective of whether they remained with their families of origin. Children's temperament and self-regulatory qualities and neighborhood quality may promote resilience, but these associations were less consistent. Cognitive stimulation and emotional support from current caregivers across early childhood were more consistently associated with higher probabilities of resilience at school entry. Yet, children who remained in home after the index CPS investigation did not benefit equally from positive parenting practices as compared with children who were placed out-of-home. This study provided evidence that both the initial child placement and the timing of protective factors across early childhood were influential in promoting different domains of resilience at school entry.

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Table 1

Sample Description using Imputed Data (N=1,193)

	Mean	95% CI	
Child			
Age in months	7.11	6.79	7.42
Living with relative	0.12	0.09	0.16
Non-relative foster care	0.14	0.11	0.17
Biological parent	0.70	0.65	0.74
Male	0.49	0.43	0.54
Black	0.32	0.27	0.36
Hispanic	0.18	0.13	0.22
Native American	0.04	0.03	0.06
Instability (new caregivers by W5)	1.05	0.93	1.17
Neurodevelopmental risk	2.43	2.37	2.50
Caregiver-Baseline			
More than High school education	0.17	0.14	0.20
Married	0.36	0.31	0.41
Mental health score	0.18	0.08	0.28
Received food stamps	0.34	0.29	0.39

Table 2

Protective Factors Associated with Resilience (*N*=1,193)

	Social Resilience		Cognitive Resilience		Multi-domain Resilience	
	B	**(SE)**	**B**	**(SE)**	**B**	**(SE)**
M1. Timing						
Cognitive Stimulation						
W1	1.02	(.14)	1.28	(.20)	1.04	(.22)
W3	1.50	(.21)**	.96	(.15)	1.07	(.22)
W4	1.30	(.18)+	1.35	(.22)+	1.35	(.27)
W5	1.23	(.18)	1.20	(.19)	1.43	(.30)+
Emotional Support						
W1	.80	(.12)	1.25	(.21)	1.20	(.23)
W3	.95	(.13)	1.29	(.21)	1.10	(.21)
W4	1.05	(.14)	.98	(.17)	1.19	(.23)
W5	1.47	(.22)*	1.19	(.19)	1.17	(.24)
Neighborhood Quality						
W1	1.08	(.15)	1.04	(.18)	1.02	(.22)
W3	1.12	(.18)	.90	(.19)	1.03	(.30)
W4	.93	(.14)	.96	(.17)	.86	(.18)
W5	.99	(.14)	1.18	(.19)	.98	(.21)
W1 Self-regulation	1.21	(.17)	1.17	(.16)	1.44	(.30)+
W1 Easy temperament	1.10	(.14)	.97	(.14)	.96	(.18)
M2. Cumulative						
Total cognitive stimulation	1.80	(.25)***	1.49	(.24)*	1.65	(.33)*
Total emotional support	.98	(.17)	1.52	(.29)*	1.44	(.32)+
Total neighborhood quality	1.11	(.14)	1.01	(.15)	.92	(.18)
W1 Self-regulation	1.29	(.19)+	1.17	(.16)	1.48	(.31)+
W1 Easy temperament	1.05	(.14)	.96	(.14)	.92	(.17)
M3. Inconsistency						
SD cognitive stimulation	.40	(.15)*	.96	(.35)	1.01	(.44)
SD emotional support	1.26	(.39)	.47	(.16)*	.52	(.20)+

	Social Resilience		Cognitive Resilience		Multi-domain Resilience	
	B	**(SE)**	**B**	**(SE)**	**B**	**(SE)**
SD neighborhood quality	.69	(.23)	1.10	(.44)	1.19	(.58)
W1 Self-regulation	1.29	(.17)+	1.20	(.16)	1.54	(.32)*
W1 Easy temperament	1.07	(.13)	.98	(.14)	.97	(.17)
M4. Cumulative and Inconsistency						
Total cognitive stimulation	1.64	(.25)**	1.63	(.29)**	1.86	(.43)**
Total emotional support	1.25	(.23)	1.37	(.29)	1.34	(.36)
Total neighborhood quality	1.07	(.14)	1.05	(.16)	.95	(.18)
SD cognitive stimulation	.58	(.25)	1.46	(.56)	1.70	(.83)
SD emotional support	1.99	(.75)+	.78	(.30)	.86	(.42)
SD neighborhood quality	.78	(.27)	1.28	(.52)	1.32	(.65)
W1 Self-regulation	1.26	(.18)+	1.18	(.16)	1.48	(.30)+
W1 Easy temperament	1.07	(.14)	.96	(.14)	.93	(.18)

Notes: Exponentiated coefficients (odds ratios). Models included all discussed covariates and sampling weights.

Table 3

Predicted Probabilities of Resilience by Levels of Protective Factors

	Social Resilience		Cognitive Resilience		Multi-domain Resilience	
	Pr.	95% CI	Pr.	95% CI	Pr.	95% CI
From M1: Timing						
As observed	.38	[.35, .40]	.25	[.23, .26]	.11	[.10, .12]
At average levels across waves	.35	[.34, .36]	.22	[.21, .23]	.09	[.09, .10]
Above average early, below average later	.26	[.25, .26]	.20	[.19, .20]	.06	[.06, .07]
Below average early, above average later	.46	[.45, .47]	.24	[.23, .25]	.13	[.12, .14]
Above average emotional support at all waves (other values as observed)	.40	[.38, .42]	.35	[.33, .36]	.16	[.15, .17]
Above average cognitive stimulation at all waves (other values as observed)	.57	[.55, .59]	.36	[.34, .37]	.18	[.17, .19]
From M2: Cumulative						
Average on all	.37	[.36, .38]	.23	[.22, .24]	.09	[.09, .10]
Below average on all	.23	[.23, .24]	.12	[.11, .12]	.05	[.04, .05]
Above average on all	.53	[.51, .54]	.39	[.38, .40]	.18	[.17, .19]
Above average cumulative emotional support (other values as observed)	.38	[.36, .39]	.31	[.30, .33]	.14	[.13, .15]
Above average cumulative cognitive stimulation (other values as observed)	.51	[.49, .52]	.31	[.29, .32]	.15	[.14, .16]

Table 4

Protective Factors Associated with Resilience by Initial Living Arrangement

	Social Resilience		Cognitive Resilience		Multi-domain Resilience	
	In Home	**Out-of-home**	**In Home**	**Out-of-home**	**In Home**	**Out-of-home**
M1. Timing						
Cognitive Stimulation						
W1	.96 (.17)	1.07 (.24)	1.20 (.26)	1.46 (.36)	.94 (.26)	1.29 (.45)
W3	1.70 (.32)**	1.31 (.29)	1.14 (.23)	.83 (.21)	1.25 (.32)	.76 (.26)
W4	1.24 (.22)	1.59 (.36)*	1.22 (.27)	1.57 (.39)+	1.28 (.32)	1.50 (.53)
W5	1.46 (.25)*	1.01 (.21)	1.18 (.23)	1.05 (.26)	1.55 (.43)	1.18 (.38)
Emotional Support						
W1	.76 (.14)	1.06 (.21)	1.31 (.29)	1.02 (.23)	1.22 (.31)	1.11 (.35)
W3	.80 (.14)	1.66 (.39)*	1.21 (.27)	1.63 (.43)+	.94 (.23)	1.70 (.62)
W4	1.05 (.18)	.99 (.22)	1.06 (.23)	.84 (.21)	1.31 (.32)	.99 (.35)
W5	1.40 (.27)+	1.55 (.38)+	1.22 (.25)	1.21 (.29)	1.15 (.31)	1.34 (.47)
Neighborhood Quality						
W1	1.05 (.18)	1.35 (.32)	.96 (.20)	1.10 (.29)	.89 (.23)	1.71 (.64)
W3	1.12 (.24)	.96 (.24)	1.03 (.27)	.65 (.18)	1.08 (.40)	.78 (.29)
W4	1.04 (.18)	.70 (.18)	.92 (.20)	1.24 (.36)	.83 (.21)	1.05 (.40)
W5	.90 (.15)	1.43 (.36)	1.28 (.24)	.99 (.26)	.97 (.23)	1.05 (.37)
W1 Self-regulation	1.17 (.22)	1.36 (.24)+	1.26 (.25)	1.24 (.23)	1.42 (.38)	1.58 (.42)+
W1 Easy temperament	1.39 (.29)	.91 (.15)	.78 (.18)	1.14 (.20)	.89 (.26)	1.01 (.26)
M2. Cumulative						
Total cognitive stimulation	2.06 (.36)***	1.72 (.39)*	1.52 (.33)+	1.42 (.32)	1.83 (.47)*	1.32 (.39)
Total emotional support	.82 (.17)	1.67 (.41)*	1.56 (.38)+	1.46 (.42)	1.39 (.38)	1.67 (.71)
Total neighborhood quality	1.12 (.19)	1.14 (.25)	1.10 (.22)	.90 (.18)	.86 (.20)	1.21 (.35)
W1 Self-regulation	1.24 (.24)	1.37 (.23)+	1.24 (.24)	1.18 (.23)	1.45 (.39)	1.58 (.49)
W1 Easy temperament	1.32 (.27)	.92 (.14)	.77 (.18)	1.16 (.20)	.84 (.24)	1.02 (.24)
M4. Cumulative and Inconsistency						
Total cognitive stimulation	1.76 (.33)**	1.92 (.49)*	1.62 (.38)*	1.55 (.38)+	2.01 (.59)*	1.51 (.52)
Total emotional support	1.07 (.25)	2.16 (.69)*	1.41 (.38)	1.40 (.48)	1.31 (.43)	1.64 (.82)

	Social Resilience		Cognitive Resilience		Multi-domain Resilience	
	In Home	**Out-of-home**	**In Home**	**Out-of-home**	**In Home**	**Out-of-home**
Total neighborhood quality	1.06 (.18)	1.15 (.25)	1.13 (.23)	.93 (.19)	.89 (.21)	1.23 (.37)
SD cognitive stimulation	.36 (.18)*	1.76 (.91)	1.35 (.67)	1.39 (.80)	1.57 (.94)	1.79 (1.49)
SD emotional support	2.09 (.96)	2.27 (1.16)	.75 (.38)	.93 (.50)	.88 (.55)	.99 (.71)
SD neighborhood quality	.68 (.28)	.94 (.50)	1.16 (.60)	1.69 (.95)	1.29 (.77)	1.42 (1.06)
W1 Self-regulation	1.22 (.23)	1.37 (.23)+	1.25 (.23)	1.18 (.23)	1.44 (.38)	1.57 (.48)
W1 Easy temperament	1.32 (.28)	.96 (.15)	.77 (.18)	1.17 (.21)	.85(.25)	1.05 (.25)

Note: In home group = 698; Out-of-home = 495. Exponentiated coefficients. Standard errors in parentheses.