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A Transactional Approach to Preventing Early Childhood Neglect: The Family Check-Up as a Public Health Strategy

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Abstract

This study examined the hypothesis that a brief, strengths-based home visiting strategy can promote positive engagement between caregiver and child and thereby reduce various forms of early childhood neglect. A total of 731 low-income families receiving services through the Women, Infants, and Children Nutritional Supplement (WIC) program were randomized to WIC as usual or the Family Check-Up (FCU) intervention. Assessments and intervention services were delivered in the home environment at ages 2, 3, 4, and 5. During the assessments, staff videotaped caregiver–child interactions and rated various features of the home environment, including the physical appropriateness of the home setting for children. Trained observers later coded the videotapes, unaware of the family’s intervention condition. Specific caregiver–child interaction patterns were coded and macro ratings were made of the caregiver’s affection, monitoring, and involvement with the child. An intention-to-treat design revealed that randomization to the FCU increased duration of positive engagement between caregivers and children by age 3, which in turn was prognostic of less neglect of the child at age 4, controlling for family adversity. It was also found that family adversity moderated the impact of the intervention, such that the families with the most adverse circumstances were highly responsive to the intervention. Families with the highest levels of adversity exhibited the strongest mediation between positive engagement and reduction of neglect. Findings are discussed with respect to developmental theory and their potential implications for a public health approach to the prevention of early-childhood maltreatment.

Introduction

It is a serious public health challenge to design services that are effective for preventing child maltreatment but are also engaging and palatable to caregivers. A formidable challenge to prevention and intervention efforts is that some forms of maltreatment, such as physical assault and sexual exploitation, are as serious as they are rare and are difficult to detect early to prevent harm to the child. Severe forms of abuse and maltreatment clearly reflect distorted caregiver cognitions (e.g., Bugental, 1989) and often emerge from adults' own abusive childhoods and familial experiences (Knutson & Mehm, 1988; Widom, 1989). It is therefore useful to consider maltreatment from a developmental psychopathology perspective, with a focus on the emergence of maltreatment in families and a specific emphasis on the interface of normative and psychopathological development (Cicchetti, 1990). Within this framework, it is critical to study subclinical forms of maltreatment, such as neglect, that are both a precursor to and the foundation of more extreme forms of maltreatment (Dubowitz, 2013). One strategy is to prevent the daily conditions and interactions that give rise to a neglecting caregiver environment from which more serious maltreatment events emerge.

Considerable developmental evidence supports this transactional perspective on child maltreatment (Belsky, 1993; Cicchetti & Lynch, 1993; Fergusson, Boden, & Horwood, 2008). However, this perspective has not been fully translated to the design of palatable and realistic prevention services (Kellam & Van Horn, 1997; Sameroff & Fiese, 1987). Our study examined whether the Family Check-Up (FCU; Dishion & Kavanagh, 2003; Shaw, Dishion Supplee, Gardner, & Arnds, 2006), a brief, periodic intervention, can effectively promote caregivers' use of positive behavior support strategies with young children (ages 2–3 years), which in turn prevent core dimensions of child neglect by age 4. The study included direct observations of caregiver–child transactions at ages 2–3 years and longitudinal assessment of macro-level measures of caregiver neglect at age 4 among an ethnically diverse group of high-risk families ($N = 731$) engaged in Women, Infants, and Children Nutritional Supplement (WIC) services. In addition, a family adversity index was considered as a potential moderator of intervention effects. When the children were age 2, the families were recruited, assessed, and randomly assigned to be *offered* the FCU (Dishion & Kavanagh, 2003; Shaw et al., 2006) or to receive the usual WIC services.

The vast majority of interventions that target child maltreatment address the consequences, such as posttraumatic stress disorder (Cohen, Mannarino, Murray, & Igelman, 2006; Tremblay & Peterson, 1999). The focus on the consequences of maltreatment is critical in that long-term mental health is seriously undermined (Cicchetti & Lynch, 1993) and development of normative milestones is compromised (Pears & Fisher, 2005). Problematic emotional and social development in childhood often persists to emotional maladjustment in early adulthood (e.g., depression, anxiety, traumatic stress) and suicide attempts (Crowell et al., 2008; Fergusson et al., 2008). Harsh and maltreating early experiences, coupled with genetic vulnerability, are prognostic of serious antisocial behavior (Odgers et al., 2008), especially for males (Caspi et al., 2002).

It is not surprising that antisocial behavior is more prevalent among children and adolescents who have a history of maltreatment. From an evolutionary perspective, youths who have experienced low levels of nurturance and high levels of harshness in childhood are likely to adapt at multiple levels, including the ways in which they view and think about the world (Figueredo, Vásquez, Brumbach, & Schneider, 2004; Frankenhuis & de Weerth, 2013). Even more problematic is the tendency to self-organization into groups in early adolescence that promote amplification of antisocial tendencies and promiscuous sexual practices (Dishion, in press; Dishion, Ha, & Véronneau, 2012). These adaptations, known as a *fast life history strategy*, frequently culminate in having more children earlier in development, when caregivers are less mature and less committed to family life, which potentiates the cross-generation perpetuation of child maltreatment (Belsky, 1993; Knutson, 1985).

Effective reduction and prevention of child maltreatment entails an integrated, multilevel strategy (see Biglan, 2015), including the provision of support services to children and families who experience and perpetuate maltreatment. In conditions of severe maltreatment, it is often necessary to remove the child from the home. During the past 10 years, remarkable progress has been made in the design of nurturing and safe treatment foster care that emphasizes skilled and compassionate behavior management strategies (Chamberlain et al., 2008; Price & Landsverk, 1998). Careful study of the physiological and psychological adaptation of children who have been removed from maltreating environments and placed in sane and safe treatment foster care suggests that safe and sane environments support recovery of the basic human stress response (i.e., diurnal cortisol patterns), improved DNA integrity (i.e., telomere length), and improved child behavior and emotional regulation (Asok, Bernark, Roth, Rosen, & Dozier, 2013; Dozier et al., 2006; Fisher, Burraston, & Pears, 2005; Fisher, Stoolmiller, Gunnar, & Burraston, 2007). Treatment foster care is rapidly becoming the mainstay of child welfare agency efforts to ensure safe and nurturing environments for children who have endured maltreatment in the family of origin.

Proactively providing treatment for families that show early signs of maltreatment may help prevent escalation of problematic parenting and the occurrence of abusive events and eventual removal from the home. For example, it is often the case that the mandated reporters (e.g., teachers, social workers, psychologists, doctors, nurses) will report suspected child abuse (physical, neglect, or sexual) to child protective agencies. In the absence of sexual abuse, the optimal strategy is to work directly with the parents and to emphasize nonpunitive, supportive parenting strategies (Zisser & Eyberg, 2010). In general, efforts to promote adult engagement in the caregiving role and to support positive parenting have generally been successful worldwide (see Knerr, Gardner, & Cluver, 2013, for a review).

Engaging and providing support to parents with a documented history of maltreatment of their child, however, is clinically challenging in part because of established patterns of interaction, but also because of the lack of trust for service providers (see Reid & Kavanagh, 1985). As community-based research suggests (see Belsky, 1993; Cicchetti & Lynch, 1993), families characterized by officially documented maltreatment also often experience several family adversities, with unique, disruptive constellations of difficulty specific to each family, including unemployment, substance abuse, daily frustrations, caregiver depression, and legal difficulties (Belsky, 1993). Despite adversities and the many clinical challenges

facing maltreating parents, interventions designed to reduce maltreatment have been effective (Skowron & Reinemann, 2005). Perhaps the most successful among them is Parent–Child Interaction Therapy (PCIT), which provides intensive support to caregivers in the form of videotaped feedback and in vivo coaching (Zisser & Eyberg, 2010). Randomized studies suggest improvement in observed parenting, especially for those who complete the intensive intervention regimen (Thomas & Zimmer-Gembeck, 2011).

In a key study of child neglect and abuse prevention that used the Triple P parenting program (Sanders, 1999), participating families in 18 counties in the southeastern United States were assigned to a control or an intervention condition. This multilevel approach to supporting empirically validated child management strategies was offered at the universal level to all families in a general community. Universal support included media and education for all professionals providing services to children and families, and for the families themselves. These supports promoted caregiver strategies to reinforce positive child behavior and nonpunitive approaches to limit setting with children's problem behavior (e.g., Forgatch & Patterson, 2010; Webster-Stratton & Reid, 2010; Zisser & Eyberg, 2010). This large-scale community promotion of positive parenting practices has shown modest reductions in the prevalence of officially reported maltreatment cases across the intervention communities (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009).

A preventive approach to child maltreatment is critical, because after-the-fact interventions for child maltreatment may not be effective for all caregivers and in some cases may be iatrogenic. Emotional sequelae may be associated with a family's experience with child protective services. For example, parents may show hostility to the child (Bugental, 1989) and find it challenging to engage positively in the caregiving process and intervention protocols (Giuliano, Skowron, & Berkman, 2015). From a transactional perspective, daily stressful interactions with a young child may undermine the parental investment in long-term, sensitive, and involved caregiving. Parenting requires self-regulation, and having several competing demands on time and energy while caregiving young children will certainly undermine the formation and development of positive caregiver–child interaction. Maltreatment often occurs in an impoverished family context in which adults are suffering mental health and substance use challenges, and their engagement in positive parenting may be further undermined by single parent status and neighborhood factors. The disruptive effect of these factors has been studied individually, but considerable evidence suggests the value of considering an overall index of family adversity (Rutter, 1983). Although it is clear that family adversity is correlated with child maltreatment, it is possible that families living in adverse circumstances may benefit from nonstigmatizing and motivating preventive family services.

A critical challenge in stressed families is isolation and insularity brought about by an inability to seek support services simply because family members lack access to transportation (Wahler, 1980). Efforts to prevent maltreatment, therefore, have increasingly focused on home visiting interventions to circumvent barriers to engagement in services secondary to family adversity. The nurse home visiting program designed and tested by Olds and colleagues (1997) has provided the most compelling evidence of the benefits of very early intervention efforts for young families living in high-risk contexts. In this program,

young expectant mothers are assigned a home visiting nurse who initially attends to the woman's prenatal health (e.g., smoking, diet, physical exams) and to the postnatal caregiving environment in the home. Several studies have documented striking long-term benefits of the program to the children from birth through adolescence (e.g., Olds, Hill, Robinson, Song, & Little, 2000). Not surprisingly, the early study also found significant benefits (46% reduction) in terms of child abuse and neglect in childhood (Olds et al., 1997). The nurse home visiting program assumes a strong developmental focus on the parent and restricts the services to young mothers with their first child, with the idea that mothers with more children may have already habituated into caregiving patterns that may be difficult to change and that "lessons learned" with the first child will be transferrable to the parenting of younger siblings.

Attachment theory suggests that early, sensitive caregiver interactions promote the child's sense of security and increase parental investment in future parenting. Sensitive caregiving often involves reading young children's emotional state and adjusting parenting to nurture and support the development of emotion and behavior regulation. Techniques that successfully promote parent sensitivity are inherently strengths based in that they identify and label caregiver competencies. Parent motivation may also be enhanced through the use of feedback about videotaped caregiver proficiencies. Randomized interventions that promote sensitive parenting reveal moderate effect sizes (see Bakermans-Kranenburg, Van Ijzendoorn, & Juffer, 2003, for a review). Moss et al. (2011) used a randomized design to test the effectiveness of eight weekly videotaped home visits followed by feedback, which proved to be a critical part of the effort to promote sensitive parenting. Results showed increases in sensitive parenting, improvements in child attachment security, and reductions in child behavior problems.

Of particular importance to a transactional perspective on the prevention of child maltreatment is research that examines the specific mediating and moderating mechanisms that link prevention strategies to reduced risk of child maltreatment. Identification of mediators and moderators advances the causal knowledge needed to understand how an intervention works and for whom it will be effective (MacKinnon & Fairchild, 2009). Analysis of mediation entails disentangling the unique effects of an intervention on maltreating processes by changing patterns of daily parent-child transactions while controlling for other possible covariates of change. We know that interventions are generally effective for promoting positive and sensitive parenting and reducing hostile attributions (Bugental et al., 2002). However, it is yet unclear whether intervention effects on the core dimensions of maltreatment are mediated through changes in daily transactions between caregivers and children.

The goal of this study was to model the processes through which effects on the core dimensions of maltreatment are mediated. The study involved a randomized examination of the FCU adapted to the specific needs of families with young children seeking support from WIC. The initial study of the FCU among WIC parents revealed the three-session intervention effectively reduced child behavior problems from age 2 through 4 (Shaw et al., 2006). Interestingly, the FCU also resulted in observed maintenance of caregiver involvement with the child, which was greater than that observed among the control group.

However, changes in parent involvement did not mediate reductions in children's problem behavior, perhaps because the FCU had been limited to one dose when children were age 2 (Shaw et al., 2006). Findings from a later study with a large multiethnic sample ($N = 731$) and FCUs carried out at child ages 2 and 3 showed that reductions in parent-reported behavior problems between age 2 and 4 were mediated by changes in directly observed parents' positive behavior support practices (Dishion et al., 2008). Later it was found that these short-term changes translated to long-term improvements in children's outcome in that teachers rated the children as less oppositional at age 7.5 (Dishion et al., 2014), and measures of self-regulation and academic achievement showed the children to be more school ready (Brennan et al., 2013; Lunkenheimer et al., 2008).

Positive behavior support reflects a set of strategies known to promote growth in competence and prosocial behavior in children and adolescents (Lucyshyn, Dunlap, & Albin, 2002; Sugai & Horner, 2002). The integrative framework suggests that relationship-enhancing (e.g., sensitivity) and behavioral (e.g., clear prompts, reinforcement) strategies are mutually nurturing and effective for promoting youth well-being and competence. Direct observations of parenting practices in early childhood (Dishion et al., 2008; Sitnick et al., 2014) and adolescence (Dishion, Forgatch, Van Ryzin, & Winter, 2012) suggest that the average duration of dyadic positive engagement is a critical index of positive behavior support. Longer dyadic positive engagement episodes with a child suggest the exchange of more words, proactive management of conflict, and mutuality in the interpersonal relationship.

This longitudinal study addressed the hypothesis that increases in directly observed dyadic positive engagement in early childhood (ages 2 to 3) mediates the benefits of the FCU in terms of reducing core dimensions of child maltreatment at age 4, that is, affection neglect, caregiving neglect, and monitoring neglect. We also tested the hypothesis that family adversity, in general, undermines dyadic positive engagement and directly leads to the emergence of neglect of the child. Finally, we explored the moderating role of family adversity in responding to FCU services, with respect to improvement in caregiver-child interaction and subsequent neglect.

Method

Participants

Between 2002 and 2003, 731 families were recruited from WIC programs in Eugene, Oregon; Pittsburgh, Pennsylvania; and Charlottesville, Virginia. WIC services offer nutritional assistance to indigent families with children between ages 0 and 5 years across the United States. This randomized trial was based on a previous prevention trial that involved 120 WIC families and similar recruitment strategies that tested the viability of the FCU in early childhood (Shaw et al., 2006). Families engaged in WIC services were invited to participate in our study on the basis of the following inclusion criteria: (a) they had a child between ages 2 years 0 months and 2 years 11 months, and (b) they reported family, socioeconomic, and/or child risk factors for child's future behavior problems; more specifically, families had to score at least one standard deviation above the normative mean in two of the three domains of risk: (1) familial (i.e., maternal depression, daily parenting

challenges, substance use problems, teen parent status), (2) child (i.e., conduct problems and high-conflict relationships with adults), and (3) sociodemographic (i.e., low education achievement and income relevant to WIC criterion). Child maltreatment was not a criteria for selecting families into the study.

A total of 1,666 families were approached at WIC sites for inclusion in the study. Among them, 879 families met the eligibility requirements and 731 families consented to participate in the study. Of the families who consented, 272 families (37%) were recruited in Pittsburgh, 271 (37%) in Eugene, and 188 (26%) in Charlottesville. At the time of the initial assessment, the children (49% female) had a mean age of 29.9 months ($SD = 3.2$). Primary caregivers were ethnically diverse across sites: 46.6% European American, 27.6% African American, 13.4% Hispanic, 9.8% biracial, and 2.4% other groups (e.g., American Indian, Native Hawaiian). More than two-thirds of the families had an annual income of less than \$20,000, and the average number of family members per household was 4.5 ($SD = 1.63$). In terms of primary caregivers' education level, 23.6% of the caregivers had less than a high school education, 41% had a high school diploma or general education diploma, and 35.4% had post-high school training.

The flow of participant recruitment, assessment, and randomization procedures in our study is shown in Figure 1. The longitudinal retention rate was high overall between ages 2 and 4: 659 (90%) families from the baseline sample ($N = 731$) were retained at the age 3 follow-up and 624 (85%) families at the age 4 follow-up assessments.

Procedure

Home assessment procedure—All home assessments were conducted with families, including a primary caregiver (PC) and a target child. Alternate caregivers were also assessed when available. Home assessment procedures were identical for participants in the control and the intervention groups. The assessment involved both structured and unstructured play activities for the target child and PC. The specific task procedure was as follows: the target child was involved in a free-play task (15 minutes); afterward, the PC and child participated in a clean-up task (5 minutes), a delay of gratification task (5 minutes), and four teaching tasks (3 minutes each). Then, a second free-play task (4 minutes) was given to the target child, followed by the child and PC doing a second clean-up task (4 minutes). Finally, there was the presentation of inhibition-inducing toys (2 minutes) followed by a meal preparation/lunch task (20 minutes). The same home assessment procedures were repeated at ages 3 and 4 for the control and the intervention groups. All PC–target child interactions were videotaped during the assessment session for later coding. A more detailed description of the home assessment protocol is available in Dishion et al. (2008).

Before randomly assigning participants to the control or intervention group, initial home assessments at age 2 were completed, and to increase internal validity of our study, assessment staff remained unaware of the family's group assignment. After the initial assessment (at age 2), home assessments were conducted annually. For families in the FCU intervention group, the annual home assessments were carried out prior to the intervention sessions.

Families participating in the project received financial incentives: \$100 for participating in the initial assessment at age 2, \$120 for the age 3 assessment, and \$140 for the age 4 assessment. Each home assessment lasted approximately 3 hours. Written consent was obtained from all participants prior to participation in the study. In addition, ethical clearance was obtained independently from the institutional review boards at three universities. Those in the control condition were paid only for assessments and otherwise received WIC services as usual. They were not offered the FCU; however, as a courtesy, all control and intervention participants received a list of local mental health and developmental disability services.

The Family Check-Up procedure—The FCU is a brief, three-session intervention that is offered annually and includes information about available and relevant evidence-based parenting support services. The FCU service model is individually tailored to each family on the basis of home assessment results. The three sessions include (a) a home-based, observational assessment session that is multi-informant and ecological, (b) an initial intake session, and (c) a feedback session (see Dishion & Stormshak, 2007, for a review). To ensure that the observational assessments were not biased, families in our study first were involved in the observational assessment session and then were invited to engage in the initial interview session and feedback. During the interview session, a trained consultant examined a PC's concerns, particularly about family issues that are important to the well-being of the child. The feedback session focused on observed parenting and family strengths but also included a discussion about possible areas of change in the family and in parenting practices. A motivational interviewing approach was used to elevate the PC's motivation to change their key parenting weaknesses.

The FCU is designed to assess the need for follow-up evidence-based parenting support services articulated in the Everyday Parenting curriculum (Dishion, Stormshak, & Kavanagh, 2011). Everyday Parenting sessions are consistent with other proven approaches to parent management training, particularly the Oregon model for parent training (Forgatch & Patterson, 2010). A direct observation of videotapes of provider services was developed to assess the need for follow-up sessions (Dishion, Knutson, Brauer, Gill, & Risso, 2010). A recent study of service provider fidelity revealed adequate fidelity. In addition, it was found that variation in provider competent adherence to the FCU model was prognostic of caregiver engagement in the FCU feedback session, which in turn was associated with improvements in parenting and in children's problematic behaviors between ages 2 and 4 (Smith et al., 2014).

Measures

Observed dyadic positive engagement—A critical advantage of using observed caregiver-child interaction as both a mediator and an outcome is that coders are blind to the intervention condition of the family. The Relationship Affect Coding System (RACS; Peterson, Winter, Jabson, & Dishion, 2008) is a microsocial coding system that captures the topography of relationship behaviors and the affect in PC-child interactions (e.g., emotional displays or lack thereof). This system was used to code the videotaped PC-child interaction tasks at ages 2, 3, 4, and 5. We used data only from ages 2 and 3 in our study. The RACS

reflects three simultaneous dimensions of behavior—verbal, physical, and affect—for each target child and PC. Each of the three dimensions of behavior is coded into three categories: positive, negative, and neutral. The behavioral cues that are used for coding are based on participants' facial expressions, tone of voice, and nonverbal cues (e.g., body posture and/or orientation).

Noldus Observer XT, Version 11.0 (Noldus Information Technology, 2012) was used to record RACS codes. The software allows for continuous coding of an interaction between the child and PC, simultaneously. Because there were three simultaneous data streams for each participant in the interaction tasks, six behavior clusters were created that represent the three data streams for each person (PC and child) in the interaction. The six behavior clusters are *positive*, *neutral*, *directives*, *negative*, *no talk*, and *ignore*. For instance, the positive behavior cluster included behaviors such as positive verbal, structure, affect or physical, and validation. The negative behavior cluster included behaviors that are associated with anger and disgust, negative verbal statements, and negative physical interaction. Decision rules were created to determine which behavior stream wins out in the event that two different behavior streams were present simultaneously. The order of trumping was as follows: (1) ignore, (2) negative, (3) positive, (4) directive, (5) no talk, and (6) neutral behavior. For example, if a PC made a negative verbal statement to the target child and then showed positive affect at the same time, the negative behavior stream would trump the positive behavior stream. Based on the six behavior clusters, dyadic states were derived by coding both the parent's and the child's state at every second of the videotaped observation. As such, the durations and frequencies of behavior clusters could be calculated not only for the PC and the child respectively, but also for the aforementioned dyadic states and interaction dynamics within families (both PC and child).

Observing both parent and child interaction in real time enables the ability to quantify dyadic states (Granic & Hollenstein, 2003; Hollenstein, 2007). In previous work with this coding system (Dishion, Forgatch, et al., 2012), we examined the validity of four dyadic states: *positive engagement*, *neutral engagement* (e.g., mostly verbal conversation), *coercive engagement*, and *noninteractive*. Of interest to this research is the duration of positive engagement between the caregiver and child. Dyadic positive engagement (DPE) is a summary score and reflects the duration of positive (POS) and neutral (NEU) behavior engagement between the PC and the child. Thus, the DPE included 4 out of 36 possible cells on the grid shown in Figure 2.

A duration-proportion score was then calculated for the four dyadic states by dividing the total duration of each caregiver–child dyad observed in the region by the overall session time. Reliability coefficients were in good to excellent range, with an overall kappa score of .93 at each age and coder agreement of 93% and 94% at age 2 and 3, respectively. Kappa coefficients were computed by Noldus Observer and were based on the duration and sequencing of coded behavior.

Child neglect at age 4—Child neglect at age 4 was conceptualized and measured with three coder ratings. Coders completed the Coder Impressions Inventory (COIMP; Dishion, Hogansen, Winter, & Jabson, 2004) on the basis of the observed videotaped interactions of a

PC and child at ages 2, 3, 4, and 5. However, our study used only age 2 and age 4 COIMP data. The COIMP was developed to measure various dimensions of family management processes, such as PC–child relationship quality, negative PC–child interaction, and family problem-solving skills. Coders rated each construct on a 9-point response scale in which 1 = *not at all*, 5 = *somewhat*, 9 = *very much*. Two outcome variables were created from these COIMP items. *Affection neglect* was derived from the mean of two COIMP items: (a) “The parent shows affection and/or love for the child during the observation session” (reverse coded), and (b) “The parent hugs, kisses, cuddles, tickles, or otherwise touches the target child in a positive way during the session” (reverse coded).

The second dimension of neglect, *monitoring neglect*, was formed from the mean of three COIMP items: (a) “The parent seems to be mindful of the child’s behavior, whereabouts, activities and feelings” (reverse coded); (b) “The parent seems to have clearly established routines that are well understood and practiced by the child” (reverse coded); and (c) “The parent seems ‘tired-out’, depressed, or inattentive to the child during the task.” The Spearman-Brown coefficient, for reliability of a two-item scale (Eisinga, te Grotenhuis, & Pelzer, 2013), was .86 and .85 for the affection neglect variable at ages 2 and 4, respectively. The Cronbach’s alpha coefficients for the three-item monitoring neglect were .70 to .68 for ages 2 and 4, respectively.

The third dimension, *caregiving neglect*, was measured using the original Home Observation for Measurement of Environment (HOME; Caldwell & Bradley, 2003). This measure includes 36 items used to assess the quality and quantity of support and stimulation in the home environment. HOME uses naturalistic observation to measure the parenting context (Caldwell & Bradley, 2003). The examiners visited each participant’s home for 3 hours, which enabled them to observe PC–child interactions and parental warmth and support. The lead examiner completed the HOME at the end of the visit. Among the observationally based HOME items, one item (“basic hygiene appears to be observed”) was selected to measure *caregiving neglect* in our study. This item was rated on a 4-point Likert scale in which 1 = *not at all true*, 2 = *hardly true*, 3 = *somewhat true*, and 4 = *very true*, and was reverse coded for our analyses.

Family Adversity Index

The family adversity index at age 2 was generated by the sum of eight indicators as follows: (a) PC income below the national poverty line, (b) low PC education level (i.e., less than high school education), (c) single parenthood, (d) household overcrowding (i.e., four or more children in home and more family members than the number of rooms), (e) household member with legal conviction (i.e., someone in the home convicted of crime), (f) PC with drug or alcohol problems (i.e., used at least one hard drug or marijuana once per month or more, PC drank every day and three or four drinks more than half of the time), (g) neighborhood dangerousness (i.e., scored 1 standard deviation above the mean of the current sample), and (h) PC with depression (i.e., scored greater than the standard clinical cutoff core of 16 on the Center for Epidemiological Studies on Depression Scale; Radloff, 1977). Families received a score of 1 for each indicator if an adversity was present or a score of 0 if an adversity was absent. Possible scores on the family adversity index ranged from 0 to 8.

Data Analysis Plan

Descriptive statistics and bivariate correlations were first examined for all study variables, including covariates. Multivariate outlier analyses, using Cook's distance as criteria (Cook, 1977), were conducted for the prediction of the mediator (i.e., DPE) and outcome variables. Attrition analyses were conducted on key demographic variables, diversity variables, and outcome variables at baseline. Mplus 7 software (Muthén & Muthén, 2012) was used to investigate the hypothesized mediation model (see Figure 3). Full information maximum likelihood (Arbuckle, 1996) estimation was used to handle missing data. Although the paths are not shown in Figure 2, the FCU treatment effect on dyadic positive engagement at age 3 controlled for the baseline score of DPE and child gender. In addition, all the effects on outcome variables at age 4 (i.e., affection, monitoring, caregiving neglect) controlled for their baseline scores at age 2 and for child gender. Family adversity at age 2 was included as a moderator for the intervention effects on the mediator and from the mediator to the outcome variables. Family adversity was centered prior to moderation analysis. To assess mediated effects in the study model, the percentile bootstrapping method was used (Taylor, Mackinnon, & Tein, 2008).

Results

Table 1 shows comparisons of demographic and baseline study variables by group assignment. Chi-square test and *t*-test results indicate that there were no significant differences in demographic and baseline study variables between control and FCU intervention group except affection and caregiving neglect (i.e., they were marginally significant). Affection neglect was slightly higher in the control group than in the FCU intervention group, whereas caregiving neglect was slightly higher in the FCU intervention group. Multivariate outlier analyses revealed one influential case, which was excluded from the analysis. No noticeable differences were found between the results of the analyses with the influential case included and excluded. Attrition analysis demonstrated no significant group by attrition interactions in any demographic variables and outcome variables at baseline. However, it was found that families with low education and gross income level were less likely to be retained in the study from age 2 through 4 (both $p < .01$), regardless of the group assignment. Table 2 shows bivariate Pearson's correlations and descriptive statistics of all the variables that were used in our study. Correlations between the dyadic positive engagement at age 3 and all outcome variables at age 4 were negatively significant. Family adversity was also significantly associated with all outcome variables at age 4 in the expected direction. Child gender as a covariate was not significantly correlated with any mediator or outcome variables and was therefore excluded from the mediation model for parsimony. Skewness and kurtosis of all variables also fell within the acceptable range (skewness cutoff = 2.0 and kurtosis cut off = 7.0; West, Finch, & Curran, 1995).

The overall model tested is shown in Figure 4. To test mediation and moderation, it is necessary to control for prior levels of each of the key constructs in the model. The stability paths are not shown in Figure 4, yet all were statistically significant. The model fit adequately to the data, $\chi^2(df = 16) = 45.37, p < .001$, CFI = .93, SRMR = .03, RMSEA = 0.05 (90% CI [0.03–0.07]). Note that the missing data-handling procedures are improved by

inclusion of auxiliary variables in a model either by reducing bias or by increasing power in estimating missing information (Enders, 2010). The results were nearly identical (i.e., no noticeable changes in p -values were observed) between the models with and without the inclusion of education and income as auxiliary variables in the model.

As hypothesized and consistent with previous studies that used slightly different measures (Dishion et al, 2008), participants in the FCU intervention group indicated significantly higher DPE than did those in the control group at age 3, while controlling for the baseline measure of DPE ($B = 0.03$, $SE = 0.01$, $p < .01$). Age 3 DPE significantly predicted less affection neglect ($B = -2.29$, $SE = 0.51$, $p < .001$), caregiver neglect ($B = -0.56$, $SE = 0.15$, $p < .001$), and monitoring neglect ($B = -1.02$, $SE = 0.36$, $p < .01$) at age 4, controlling for the same baseline measures at age 2, family adversity, and FCU direct effect. However, no significant FCU direct effects on age 4 neglect outcome variables were observed, contrary to our expectation. Even when a separate model was computed without the DPE variable as mediator, the FCU did not significantly predict any of the age 4 neglect variables. Thus, this study reflects indirect effects of FCU on neglect at age 4 through DPE.

As expected, family adversity at age 2 was significantly associated with affection neglect ($B = 0.32$, $SE = 0.12$, $p < .05$), caregiving neglect ($B = 0.13$, $SE = 0.04$, $p < .01$), and monitoring neglect ($B = 0.32$, $SE = 0.10$, $p < .01$) at age 4 but not with DPE at age 3 ($B = -0.08$, $SE = 0.01$, $p = .14$). It was also found that family adversity significantly moderated the association between DPE and affection neglect ($B = -0.71$, $SE = 0.33$, $p < .05$), and monitoring neglect ($B = -0.52$, $SE = 0.27$, $p = .05$). To facilitate the interpretation of these moderation effects, simple slope analyses (Aiken & West, 1991) of affection neglect and monitoring neglect at age 4 on DPE at age 3 were conducted at high (i.e., +1 SD), mean, and low (i.e., -1 SD) scores of family adversity (see Figures 5 and 6). As the family adversity index increased, the negative association between DPE at age 3 and affection or monitoring neglect at age 4 became stronger. For instance, families with high adversity scores showed much steeper decreases in affection neglect as DPE increases, compared with families with low adversity scores.

The percentile bootstrapping method with a total of 1,000 bootstrapped samples was used to test the overall mediated effect for caregiving neglect and to test the simple mediated effects (Tein, Sandler, MacKinnon, & Wolchik, 2004) for affection neglect and monitoring neglect. Point estimates and the 95% confidence intervals for the overall and the simple mediating effects of DPE on the association between FCU intervention and maltreatment outcome variables are presented in Table 3. Increases of DPE at age 3 mediated the effect of the FCU intervention on reduction of caregiving neglect across all participants (95% CI [-0.035, -0.003]). In addition, participants in the FCU intervention group showed an increase of DPE at age 3, which in turn was negatively associated with affection neglect at age 4. This outcome was found for families at the mean level and at a high level of family adversity scores (95% CIs [-0.137, -0.017] and [-1.296, -0.429], respectively, for the simple mediation effects) but not at a low level (95% CI [-1.057, 0.055]). Similarly, an increase of DPE at age 3 was negatively associated with PCs' monitoring neglect at age 4 for families at the mean level and a high level of adversity scores (95% CIs [-0.068, -0.001] and [-0.679,

–0.089], respectively, for the simple mediation effects) but not at a low level (95% CI [–0.511, 0.289]).

Discussion

A tendency to neglect children's physical, social, and emotional needs in early childhood is a critical precursor and context for other, more severe forms of maltreatment, such as physical and sexual abuse (Dubowitz, 2013). In our study sample, the prevalence of these more severe forms of child maltreatment was relatively rare (less than 5% for ages 2, 3, and 4 with contact with child protective services). Given the relatively high prevalence of maternal depression, however, there was considerable variation in various forms of neglect.

The findings from this study suggest two primary conclusions in the study of parenting neglect. First, the dynamics of an attentive caregiver can be readily observed. Specifically, the average duration (in seconds) of caregiver–child positive engagement episodes in a 20-minute videotaped interaction was reliably coded, and this simple dynamic as measured at age 3 predicts multiple forms of neglect. Second, and perhaps most important, a relatively brief home-visiting service increases the duration of positive caregiver–child interactions, which in turn reduces several forms of parental neglect in early childhood.

Noteworthy was the moderation of intervention effects on childhood neglect by family adversity. Although family adversity was directly correlated with caregiving neglect, it also moderated the impact of the FCU on child neglect. Families with multiple risk factors (i.e., maternal depression, substance use, poverty) were more responsive to the FCU intervention. Specifically, the mediation between caregiver–child positive engagement at age 3 and two of the parenting indices of neglect was strongest among the families with the highest level of adversity. This finding suggests that engaging high-risk families in a public health framework is a promising public health strategy, and the families most in need are most likely to find home visiting services helpful. These findings, and the literature in general, suggest that strengths-based, nonstigmatizing home visiting services are useful for engaging and motivating families to be more involved in nurturing their young child. The FCU strategy enables caregivers to step back and look at their child's development, their situation (marital, neighborhood, social support), and their parenting. The vast majority of caregivers enjoy the FCU sessions, and many of the participating mothers in particular become less depressed over time (Shaw, Connell, Dishion, Wilson, & Gardner, 2009). The FCU provider is trained to emphasize parenting strengths and to increase the caregivers' motivation to attend to the needs and well-being of their child.

In this study, the measure of caregiving neglect was primarily the physical surroundings of the household. Many of the families in this study lived in poor contexts, some in rural and others in high-density urban housing. The physical surroundings of the home may be challenging to change without a change in income. Moreover, some of the young families resided in homes owned and led by grandparents or other extended family. It is not surprising, then, that we did not observe the same level of mediation between increases in caregiver–child positive engagement and the physical surroundings as we did with affection

and monitoring, because these coder ratings are more linked to the relationship dynamics in the family.

One of the challenges of preventing child maltreatment before it occurs is the low base rate of the behavior. Families in this study were not selected because of risk for maltreatment. Moreover, videotaped home visits are unlikely to uncover more serious forms of maltreatment, especially given ample warning associated with informed consent protocols. However, three critical aspects of neglect are readily observable in the context of a videotaped home visit. Caregivers typically are on their best behavior during the home visits, and physical maltreatment is rarely observed; nevertheless, neglect suggests that caregivers are preoccupied with their own needs and wants, and this is difficult to hide even with home visitors. Without criticizing or judging the caregiver's orientation toward self, the process can be changed. For example, while providing videotaped feedback to caregivers, we emphasize parenting strengths. The videotaped session itself is undoubtedly stressful, but it also recognizes the caregiver's efforts. The best way to build positive, effortful parenting is to elicit the practice, attend and reinforce, and answer the inevitable questions from parents about other skills and positive parenting practices. When caregivers and children spend more time in positive interactions, a relationship is fortified that prevents drift into neglect, which in turn leads to reductions in accidents, problem behaviors, or potential opportunities for other adults to take advantage of the unmonitored young child.

Strengths and Limitations

This study has a number of strengths. We used longitudinal data from early childhood to report on the influence of a brief parenting intervention on objective observer ratings of caregiver neglect both in caregiver-child interactions and in the home environment. Although many studies report only on low base rate and extreme cases of maltreatment, this report adds to the literature by investigating more prevalent, everyday occurrences of neglect that may promote later, more severe instances of maltreatment.

This study, however, is not without limitations. First, our analyses include only a 2-year period of change. Our results did show a significant influence of the FCU at age 2 on neglect at age 4, but it is not understood how long these effects on neglect would last into later childhood. To date, the FCU has been associated with 5-year reductions in child behavior problems (Dishion et al., 2014) and improvement in school readiness (Brennan et al., 2013). However, future research will focus on the connection between changes in early childhood neglect and later exposure to traumatic events in childhood and adolescence, including maltreatment. A second limitation is that measures of neglect are a snapshot of a brief home visit and may have been biased, in that a study staff member was present. Because the interactions did exhibit instances of neglect and our results did show influences of the FCU on neglect through positive engagement, we argue that these measures were valid indices of neglect.

It would nevertheless be useful to further develop an observation protocol that would assess the more complex construct of caregiver neglect. In the past we were able to develop a direct observation of parental monitoring in the home by structuring a discussion between an adolescent and a friend that evoked information about the youths' involvement with peers

when they were unsupervised. A similar strategy could be designed for early childhood that focuses on the caregiver's ability to detect and attend to the child's emotional and physical needs when they conflict with their own needs. In the FCU model, there is a tight link between assessment and intervention, and a measurement tool such as this would also be useful for motivating change and tailoring follow-up services for neglecting caregivers. We suspect that with the current measures, exemplars of neglect may have been underrepresented because of the close scrutiny of the staff, but more important, because the tasks themselves pulled for caregiver-child engagement.

In summary, this research provides evidence for a public health approach to reducing instances of maltreatment in the larger community. Our results showed that a brief family-based intervention could influence everyday occurrences of neglect through caregiver-child positive engagement. Future research should investigate further to ascertain the longevity of such effects into later childhood and whether these indices of daily neglect predict consequential, extreme cases of maltreatment.

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Figure 1. A summary of the recruitment, assessment, and randomization protocol

Figure 2. Summary score of positive engagement for parent and child derived from RACS coding

Note. Pos = positive engagement, Neu = neutral engagement, Dir = directive, Neg = negative engagement, Ntk = no talk, Ign = ignore. Primary caregiver (PC) is shown on the y axis and the target child (TC) is on the x axis.

Figure 3. Hypothesized mediation path model

Note. The following covariates were included in the analyses but are not shown in the figure for parsimony: baseline score of dyadic positive engagement, and baseline scores of all outcome variables. FCU = Family Check Up. 2 = age 2; 3 = age 3; 4 = age 4.

Figure 4. Summary of the final path model

Note: Unstandardized β coefficients for only significant paths were indicated. The following covariates were included in the analyses but are not shown in the figure for parsimony: baseline score of dyadic positive engagement, and baseline scores of all outcome variables. FCU=Family Check Up, 2 = age 2, 3 = age 3, 4 = age 5. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 5. Interaction between dyadic positive engagement and family adversity on affection neglect

Figure 6. Interaction between dyadic positive engagement and family adversity on monitoring neglect

Table 1
Demographics and Study Variables at Baseline

Variables	Control	FCU	Difference
Demographics			
Female children (%)	180 (49.5%)	182 (49.6%)	$p = .97$
Children's mean age, months (SD)	42.05 (3.28)	41.63 (3.55)	$p = .11$
Primary caregiver's education			$p = .97$
Less than high school or general education diploma (%)	92 (25.3%)	80 (21.8%)	
High school or general education diploma (%)	137 (37.6%)	163 (44.4%)	
Post-high school training (%)	135 (37.1%)	124 (33.8%)	
Primary caregiver's gross annual income			$p = .67$
< \$10,000	108 (30.0%)	102 (28.1%)	
< \$20,000	139 (38.6%)	136 (37.5%)	
≥ \$20,000	113 (31.4%)	125 (34.4%)	
Ethnicity			$p = .42$
White	170 (46.7%)	171 (46.6%)	
Black/African American	97 (26.6%)	105 (28.6%)	
Hispanic	48 (13.2%)	50 (13.6%)	
Biracial	36 (9.9%)	36 (9.8%)	
Others	13 (3.6%)	5 (1.4%)	
Living location of family			$p = .99$
Rural (Charlottesville)	93 (25.5%)	95 (25.9%)	
Suburban (Eugene)	135 (37.1%)	136 (37.1%)	
Urban (Pittsburg)	136 (37.4%)	136 (37.1%)	
Mean number of family members per household (SD)	4.49 (1.67)	4.49 (1.58)	$p = .96$
Study variables at baseline (age 2)			
Dyadic positive engagement, Mean (SD)	0.33 (0.15)	0.32 (0.16)	$p = .71$
Affection neglect, Mean (SD)	5.52 (1.93)	5.25 (1.79)	$p = .05$
Monitoring neglect, Mean (SD)	3.01 (1.13)	2.94 (1.04)	$p = .37$
Caregiving neglect, Mean (SD)	2.36 (0.64)	2.45 (0.68)	$p = .06$
Family adversity, Mean (SD)	2.53 (1.44)	2.48 (1.42)	$p = .60$

Table 2
Bivariate Pearson's Correlations, Means, SDs, Skewness, and Kurtosis of Study Variables

	1	2	3	4	5	6	7	8	9	10
Dyadic positive engagement, age 2	—									
Dyadic positive engagement, age 3	.38**	—								
Affection neglect, age 2	-.15**	-.15**	—							
Affection neglect, age 4	-.08	-.22**	.25**	—						
Monitoring neglect, age 2	-.14**	-.18**	.22**	.20**	—					
Monitoring neglect, age 4	-.19**	-.17**	.10*	.24**	.21**	—				
Caregiving neglect, age 2	-.16**	-.05	-.03	.06	.13**	.16**	—			
Caregiving neglect, age 4	-.16**	-.17**	.07	.12**	.19**	.25**	.46**	—		
Family adversity, age 2	-.10**	-.07	.05	.09*	.13**	.21**	.18**	.30**	—	
Group	-.01	.10**	-.07	-.02	-.03	-.04	.07	.01	-.02	—
Gender	-.01	-.06	-.05	-.03	-.04	-.02	-.06	-.04	-.01	.01
Mean	0.33	0.35	5.38	6.09	2.97	3.19	2.41	1.42	2.51	0.50
SD	0.15	0.15	1.87	1.85	1.09	1.17	0.66	0.69	1.43	0.50
Skewness	0.34	0.34	-0.10	-0.29	0.48	0.81	1.42	1.66	0.21	N/A
Kurtosis	-0.14	-0.01	-0.57	-0.80	1.32	0.50	2.20	2.42	-0.32	N/A

* $p < .05$

** $p < .01$

Table 3
Percentile Bootstrapping Indirect Effects and 95% Confidence Interval for the Final Model

Model pathways	Point estimate	95% CI	
		Lower	Upper
FCU → age 3 DPE → age 4 affection Neglect (family adversity at mean)	−0.077	−0.137	−0.017
FCU → age 3 DPE → age 4 affection Neglect (family adversity at −1 <i>SD</i>)	−0.501	−1.057	0.055
FCU → age 3 DPE → age 4 affection Neglect (family adversity at +1 <i>SD</i>)	−0.863	−1.296	−0.429
FCU → age 3 DPE → age 4 monitoring Neglect (family adversity at mean)	−0.034	−0.068	−0.001
FCU → age 3 DPE → age 4 monitoring Neglect (family adversity at −1 <i>SD</i>)	−0.111	−0.511	0.289
FCU → age 3 DPE → age 4 monitoring Neglect (family adversity at +1 <i>SD</i>)	−0.384	−0.679	−0.089
FCU → age 3 DPE → age 4 caregiving Neglect (overall)	−0.019	−0.035	−0.003

Note. CI = confidence interval, DPE = dyadic positive engagement