THE PROTECTIVE ROLE OF THE CAREGIVING RELATIONSHIP IN CHILD CARE FOR INFANTS AND TODDLERS FROM HIGH RISK FAMILIES

by

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ABSTRACT

Infancy and toddlerhood is an important time for the development of emotion regulation, with interactions between parents and children critical to these processes. Negative parenting behaviors can have a deleterious impact on this development; however, for infants and toddlers in child care, the classroom environment, including teacher-child interactions, provides an important setting for emotional development and may serve as a protective factor when parenting risk at home is high. The aim of the three papers presented in this dissertation was to explore the potential for child care to act as a protective factor for infants and toddlers experiencing different dimensions of parenting risk that threaten emotion regulation development: minimal sensitivity and support, harsh and intrusive behaviors, and physical abuse and neglect. Results confirmed the negative impact of unsupportive, harsh, and intrusive parenting behaviors on emotion regulation, but child care was either insignificant in mitigating these effects or operated as a buffer for certain children only. Additionally, a review of the extant literature suggested that understanding the optimal caregiving experiences in child care that meet the unique regulatory needs of maltreated infants and toddlers is limited. Collectively, implications of these findings include the need to ensure measurement validity when assessing children's experiences within child care, the importance of considering the interactive nature of child, parent, and child care factors, and the pressing need for more research regarding child care teachers' roles in facilitating emotional experiences in the classroom that meet the unique regulatory needs infants and toddlers facing risk at home.

CHAPTER 1: INTRODUCTION

Parent-child interactions that are characterized by harsh or maltreating behaviors provide minimal sensitivity and support to the unique developmental needs of infants and toddlers, threatening to undermine the development of emotion regulation (Bocknek, Brophy-Herb, & Banerjee, 2009; Cummings, Hennessy, Rabideau, & Cicchetti, 1994; Eisenberg & Fabes, 1994; Eisenberg, Hofer, & Vaughan, 2006; Kim-Spoon, Cicchetti, & Rogosch, 2013; Snyder, Stollmiller, Wilson, & Yamamoto, 2003). Emotion regulation involves the behavioral and cognitive strategies young children use to manage their emotional responses and behaviors (Calkins, 1994; Eisenberg et al., 2006), laying the foundation for social competence, emotional understanding, peer relations, empathy and academic success in early childhood (Blair, Berry, & Friedman, 2012; Calkins & Hill, 2006; Eisenberg et al., 2006; Liew, 2012; Ursache, Blair, & Raver, 2012). Infancy and toddlerhood is a critical time for these processes to develop; newborns are reliant on external forms of regulation from parents and caregivers (e.g., soothing, rocking, feeding), but rapid cognitive and physical gains across toddlerhood help turn these processes inward and young children begin to manage their own emotional states (Calkins & Hill, 2006; Sroufe, 1995).

Given the interpersonal nature of this domain, caregivers play a critical role in these processes (Calkins, 1994; Calkins & Hill, 2006). Considerable research has considered the role of parents in the development of regulatory processes (e.g., Bocknek et al., 2012; Brady-Smith, Brooks-Gunn, Tamis-LeMonda, Ispa, Fuligni, Chazan-Cohen et al., 2013; Chazan-Cohen, Raikes, Ayoub, Pan, Kisker, & Roggman, 2009; Calkins & Hill, 2006; Calkins, Smith, Gill, & Johnson, 1998; Cole, Martin, & Dennis, 2004;

Grolnick & Faraks, 2002; Morris, Silk, Morris, Stinberg, Aucion, & Keyes, 2011), but less attention has been paid to the role of other caregivers in other settings. Millions of infants and toddlers attend center-based child care (U.S. Census, 2013), representing an important setting within which children engage in interactions with teachers and the classroom environment that facilitate emotional wellbeing (Burchinal, Howes, Pianta, Bryant, Early, Clifford, et al., 2008; Jones Harden, Monahan, & Yoches, 2012; Love, Kisker, Ross, Constantine, Boller, Chazan-Cohen et al., 2005; Peisner-Feinberg, Burchinal, Clifford, Culkin, Howes, Kagan, et al., 2001; Phillips & Lowenstein, 2011; Vogel, Xue, Moiduddin, Carlson, & Kisker, 2010). However, understanding the role of child care in supporting the development of emotion regulation for infants and toddlers, especially those experiencing risk at home, is less well understood (e.g., Blair et al., 2012). The aim of the three papers presented in this dissertation is to elucidate the potential protective role of child care in promoting the emotion regulatory development of children facing different dimensions of parenting risk: harsh and intrusive behaviors, behaviors that provide minimal sensitivity and support, and maltreatment (i.e., abuse and neglect).

Ecological models of human development (e.g., Bronfenbrenner & Morris, 2006) position the child with a series of nested systems and provide the theoretical foundation for conceptualizing the importance of caregiver-child interactions in multiple caregiving settings. Home and child care constitute critical *microsystems* (i.e., immediate contexts that the child has direct contact with) within which children engage in *proximal processes* (i.e., reciprocal, sustained interactions) with parents and teachers. From this perspective, proximal processes are the primary drivers of development. Parents support emerging

regulatory capacities when they engage in sensitive, responsive, and cognitively stimulating parent-child interactions (Bocknek et al., 2009; Calkins et al., 1998; Grolnick & Faraks, 2002; Morris et al., 2011). Moreover, parenting that is physically punitive, displays negative regard, or places unnecessary restrictions on children's autonomy, limits the ability to develop effective regulatory strategies across toddlerhood (Blandon, Calkins, & Keane, 2010; Calkins et al., 1998; Calkins & Johnson, 1998; Chang, Schwartz, Dodge, & McBride-Chang, 2003; Coleman, Hardy, Albert, Raffaelli, & Crockett, 2006; Eisenberg & Fabes, 1994; Fabes, Leonard, Kupnoff, & Martin, 2001; Ispa, Csizmadia, Rudy, Fine, Krull, Bradley et al., 2013). Further, extreme disruptions to the parent-child relationship in the forms of physical abuse and neglect can have deleterious effects on emotion regulation (Cummings et al., 1994; Kim-Spoon et al., 2013; Maughan & Cicchetti, 2002), contributing to future socioemotional maladjustment and psychopathology (Burns, Jackson, & Harding, 2010; Kim & Cicchetti, 2010; Kim-Spoon et al., 2013; Maughan & Cicchetti, 2002; Teisl & Cicchetti, 2007; Shields & Cicchetti, 2001).

Just as parents and children engage in proximal processes at home, children in center-based child care engage in proximal processes with their teachers in the classroom. Teachers in infant/toddler child care are well positioned to engage in nurturing and intimate interactions (e.g., feeding, soothing, diapering) with young children, providing an important caregiving context for the development of emotional wellbeing (Howes & Hamilton, 1992; Phillips & Lowenstein, 2011). Evidence suggests that quality child care environments, including quality teacher-child interactions, buffer the negative impact of a variety of sociodemographic risk factors on socioemotional outcomes (e.g., Peisner-

Feinberg et al., 2001; Votruba-Drzal, Coley, Maldonado- Carreño, Li-Grining, & Chase-Landsdale, 2010; Watamura, Phillips, Morrissey, McCartney, & Bub, 2011). Less research has considered the protective role of quality child care in mitigating the deleterious effect of high risk parent-child interactions on emotion regulation.

To address this research gap, the papers presented in this dissertation each focus on the potential for high quality child care experiences to serve as a protective factor for children facing different dimensions of parenting risk at home. The first paper examines the reciprocal nature of negative parenting behaviors and emotion regulation across infancy and toddlerhood, including child care quality as a moderator of the adverse impact of negative parent-child interactions on subsequent emotion regulation development. The second paper examines the role of supportive parenting behaviors in trajectories of emotion regulation development, as well as the interactive nature of supportive parenting at home, teacher sensitivity in child care, and infant temperamental reactivity in facilitating emotion regulation development. Data for these two empirical papers are from the Early Head Start Research and Evaluation Project (EHSRE; Love, Kisker, Ross, Schochet, Brooks-Gunn, Paulsell et al., 2002; Love, Constantine, Paulsell, Boller, Ross, Raikes et al., 2004). Early Head Start (EHS) is a two-generation support program designed to promote the wellbeing of socioeconomically disadvantaged families with infants and toddlers by providing center-based, home-based, or a mix of child and family support and child care services. The analyses presented here include a subsample of EHS-eligible and EHS-participating children who attended center-based child care. Finally, the role of child care as a protective settings for infants and toddlers who experience maltreatment is an emerging issue in research (e.g., Dinehart, Katz, Manfra, &

Ullery, 2012). To add to this growing body of literature, the third paper reviews literature on the mechanisms by which quality teacher-child interactions may serve as a developmental asset for this vulnerable population. Details for each paper are presented below.

Paper 1: Negative Parenting, Emotion Regulation, and Child Care Quality for High-Risk Infants and Toddlers in Child Care

Parenting that is characterized by harsh and intrusive behaviors risks undermining emotion regulation by entrenching parents and children in coercive cycles of reciprocal and transactional interactions in which increases in negative behaviors lead to poorer subsequent emotion regulation, and vice versa (Del Vecchio & Rhoades, 2011; Scaramella & Leve, 2004; Scaramella, Sohr-Preston, Mirabile, Robison, & Callahan, 2008). Using autoregressive cross-lagged panel analyses, this study examined stability and reciprocal associations between harsh parenting behaviors and child emotion regulation across 14, 24, and 36 months time points, as well as the potential moderating effect of child care quality on the associations of negative parenting and subsequent emotion regulation. Results suggested that poorer emotion regulation and increased negative parenting behaviors at the 14 months time point were particularly salient in setting the stage for worse parent and child outcomes at 36 months. High quality child care was not a statistically significant protective factor. These results illustrate the importance of early parent-child interactions that match the developing regulatory needs of young toddlers, as well as considering various ways in which child care quality plays a role in these processes, and ensuring measurement validity when measuring child care quality as a component of transactional processes.

Paper 2: The Interaction of Teacher Sensitivity, Maternal Support, and Infant Negative Emotionality in the Development of Emotion Regulation in Child Care

For children who attended child care, the development of emotion regulation across infancy and toddlerhood may be influenced by a combination of parent and teacher caregiving quality. Moreover, the *differential susceptibility hypothesis* posits that children vary in their response to the caregiving environment based on their temperamental reactivity (i.e., negative emotionality), with highly reactive children more susceptible to the deleterious effect of negative caregiving experiences on emotional development, but more amenable to the positive effects of supportive caregiving environments (Belsky & Pluess, 2009). Within a latent growth curve framework, this study examined the interactive nature of teacher sensitivity, maternal support, and infant negative emotionality on development of emotion regulation across 14, 24, and 36 months. For children experiencing low maternal support at home, teacher sensitivity in child care served as a protective factor for the development of emotion regulation. Moreover, in the context of low maternal support, children with high negative emotionality were more susceptible to the protective effect of a sensitive teacher. These results highlight the importance of accounting for the interactive nature of the home and child care caregiving contexts, as well as individual differences, in determining the role teachers in center-based child care play in the development of young children's emotion regulation and for whom high quality child care is most vital.

Paper 3: The Role of Child Care in Supporting the Emotion Regulatory Needs of Maltreated Infants and Toddlers

Infants and toddlers who experience physical abuse and/or neglect are at a severe risk for disruptions to emotion regulation (Cummings et al., 1994; Kim-Spoon et al., 2013). Recent prevention and treatment efforts have highlighted center-based child care as an important setting for providing support to the needs of these children (Dinehart, Katz et al., 2012), as child care centers are already an existing point of entry for reaching high risk families (Daro & Dodge, 2009; Maughan & Cicchetti, 2002; Osofsky & Leiberman, 2011). Guided by ecological theory, this review draws on the maltreatment and child care literature to consider the opportunity for child care centers, specifically teacher-child interactions within the classroom, to support the unique regulatory needs of maltreated infants and toddlers. Existing research on the effects of child care for children facing other types of risk, as well as research with maltreated preschool children, provides a foundation for considering the role child care may play for infants and toddlers, whose emotion regulation skills are just emerging. More research is needed regarding teachers' role in facilitating effective emotional experiences in the classroom that meet the unique needs of this vulnerable population. Additionally, early childhood teacher training that focuses on infant/toddler mental health and a trauma-informed perspective of care, as well as structuring child care centers as communities of support for high risk families, all may help child care centers better serve this vulnerable population.

Summary

Collectively, the two empirical papers and one theoretical review paper presented in this dissertation consider the potential for quality experiences in center-based child care to serve as a developmental asset for children facing different dimensions of parenting risk at home: harsh and intrusive parent-child interactions, behaviors that are characterized by minimal support and sensitivity, as well as physically abusive and neglectful behaviors. Findings from each of these papers are discussed in terms of their application to research and policy, as well as implications for early care and education interventions with the aim of building support across caregiving contexts for infants and toddlers.

CHAPTER II: NEGATIVE PARENTING, EMOTION REGULATION, AND CHILD CARE QUALITY FOR HIGH-RISK INFANTS AND TODDLERS IN CHILD CARE

Negative parenting can be described as involving high levels of parental anger, disapproval and rejection towards children, the use of negative verbal tones, physically harsh behaviors, or exerting excessive control over children's actions. Negative parenting experiences throughout infancy and toddlerhood can have a deleterious effect on children's emotion regulatory development (Blandon et al., 2010; Calkins et al., 1998; Calkins & Johnson, 1998; Chang et al., 2003; Coleman et al., 2006; Eisenberg & Fabes, 1994; Fabes et al., 2001; Ispa et al., 2013), with lasting consequences for social, emotional, and academic success (Liew, 2012; Ursache et al., 2012). Conversely, young children who have difficulty regulating their emotions may pose greater caregiving challenges and elicit more negative responses from parents (e.g., Gershoff, Aber, & Clements, 2009; Sameroff, 2009; Scaramella & Leve, 2004). Ecological models (e.g., Bronfenbrenner & Morris, 2006) describe these reciprocal processes (i.e., *proximal processes*) as catalysts of human development. As such, it is important to understand the nature of proximal processes between negative parenting and emotion regulation development, with special attention paid to populations of high-risk families in which negative parenting behaviors may be exacerbated by stressors associated with living in socioeconomic disadvantage (Bradley & Corwyn, 2002; Conger & Donnellan, 2007). Given this perspective, it is also critical to consider the role of other microsystems children spend their time in, such as center-based child care. Millions of infants and toddlers spend a substantial portion of their day engaged in proximal processes with teachers and the child care classroom environment (U.S. Census, 2013). Evidence is

clear that child care *quality* is the critical determining factor in facilitating positive developmental outcomes in this setting (Love, Harrison, Sagi-Schwartz, van IJzendoorn, Ross, Ungerer et al., 2003; Phillips & Lowenstein, 2011), including operating as a protective factor when risk at home is high (Peisner-Feinberg et al., 2001; Watamura et al., 2011; Votruba-Drzal et al., 2010); however, researchers' understanding of the role child care quality plays in the development of infant/toddler emotion regulation, including serving as a protective factor for negative parenting at home, is limited (Blair et al., 2012; Denham, Bassett, & Zinsser, 2012; Mortensen & Barnett, 2015). To help clarify these processes, the present study examined reciprocal exchanges between negative parenting and emotion regulation across toddlerhood, and the moderating role of child care quality in these processes.

Emotion Regulation

Emotion regulation involves the cognitive and behavioral processes used to manage emotional arousal and behavioral expression of emotions (Eisenberg et al., 2006). Emotion regulation is an important foundation for the increasingly complex socioemotional skills developed during early childhood. Children who are able to effectively regulate their emotions are also more likely to demonstrate better social competence, increased emotional understanding and empathy towards others, and more positive peer relationships (Blair et al., 2012; Calkins & Hill, 2006; Eisenberg et al., 2006; Leiw, 2012). As children transition to formal schooling, well-regulated children are better positioned to build quality relationships with teachers and pay attention in the classroom, contributing to increased academic achievement in math and literacy, as well

as higher grade-point averages (Blair, 2002; Blair et al., 2012; Graziano, Calkins, & Keane, 2011; Liew, 2012).

Ecological models of development (e.g., Bronfenbrenner & Morris, 2006) provide a theoretical framework for conceptualizing the reciprocal interactions between parents and children in the home microsystem as the catalyst for the development of emotion regulation. Proximal processes (i.e., repeated and sustained interactions between parents and children) create a caregiving context in which emotion regulation is supported, or impeded. Newborns are reliant on external forms of regulation from caregivers (e.g., soothing, physical touch), but as toddlers gain cognitive, physical, and behavioral capabilities, increasingly complex interactions between parents' behaviors and infants' capabilities facilitate the beginnings of internal regulatory control, as well as increased ability to seek out external forms of regulation (e.g., a caregiver or special toy; Calkins & Hill, 2006; Rosenblum, Dayton, Muzik, 2009). As Sroufe (1995) illustrates: "the young child at times is able to regulate arousal and behavior successfully without caregiver intervention. But at times disorganization is avoided only by falling back on the greater capacities of the caregiver or through the caregiver's anticipatory actions, and in most cases a supportive emotional presence of the caregiver enables and bolsters the child's own self-regulation activities" (p. 192). These proximal processes are transactional in nature (e.g., Cole, 2003; Sameroff, 2009; Scaramella & Leve, 2004): just as parents influence children, children themselves elicit responses from their parents, with both parties changing over time (Bornstein, 2002).

Negative Parenting and Emotion Regulation

Intrinsic motivation to gain regulatory control is seen in toddlers' desire for autonomy from caregivers, yet scaffolding these emerging competencies in the form of sensitive, supportive, and responsive caregiving behaviors remains critical for the development of effective regulation skills (Bocknek et al., 2009; Fox & Calkins, 2003). Negative parenting behaviors may include harsh or punitive punishment for developmentally appropriate emotional transgressions, little or no support in managing emotions, or intrusive and controlling behaviors that place unnecessary restrictions on autonomy. Proximal processes characterized by these types of parenting behaviors may leave young children vulnerable to unmanageable emotional arousal and contribute to maladaptive regulation strategies (Grolnick & Farkas, 2002; Sroufe, 1995).

For example, during structured play tasks, young children show escalating levels of anger in response to increasingly dismissive, negative, contemptuous, and angry behaviors from parents (Snyder et al., 2003), and may display atypical regulating responses to increased anger such as trying to escape the situation rather than venting their frustration (Eisenberg & Fabes, 1994). Harsh responses to children's negative emotional reactions, combined with parental distress, are associated with decreased social competence by way of intensified negative emotions, such as temper tantrums or loud crying (Fabes et al., 2001). Harsh parenting behaviors characterized by anger, rejection, and discounting the child, are also associated with intensified externalizing and internalizing symptoms (Whiteside-Mansell, Bradley, Owen, Randolph, & Cauce, 2003), with emotion regulation problems as one possible causal link (Chang et al., 2003). Parenting quality has a lasting impact, with parenting that is characterized by warmth and low physically punitive

behaviors a significant predictor of self-regulatory abilities in middle childhood (Coleman et al., 2006).

Controlling and intrusive behaviors that place undue restrictions on toddlers' natural desire for autonomy leave children little room to gain skill and independence in regulating their emotions internally. Observed play and feeding interactions that are interrupting and demonstrate disregard for 6-month-old infants as "separate, active, autonomous persons" are associated with teacher-ratings of poorer emotional health and social competence, and increased behavior problems in early childhood, as compared to children whose parents were low on these behaviors during infancy (Egeland, Pianta, & O'Brien, 1993, p. 362). Research utilizing structured parent-child play tasks in laboratories designed to elicit frustration and test compliance in toddlers has observed negative and controlling behaviors during mother-toddler interactions is predictive of poorer toddler emotion regulation as well as behavioral and physiological regulation (Calkins et al., 1998). During frustration-eliciting tasks, mothers' interference with children's work is also associated with increased emotional distress, whereas positive maternal guidance is associated with more adaptive regulation strategies to cope with frustration, such as distracting oneself from the frustrating event or seeking out maternal help or comfort (Calkins & Johnson, 1998). Intrusive parenting during toddlerhood is also associated with lower levels of observed child engagement during play (especially when combined with parental negativity), increased child negativity towards the parent (Ispa et al., 2013), as well as increased internalizing and externalizing problems in early childhood (Gilliom & Shaw, 2004; Whiteside-Mansell et al., 2003). Moderation analyses have also found that the effects of maternal-child interactions persist over time, with

emotion regulation problems coupled with controlling maternal behaviors during toddlerhood associated with increased teacher-reported behavior problems in Kindergarten (Blandon et al., 2010).

Theoretically, difficulties with emotion regulation as a result of negative parenting elicit further negative parenting; these reciprocal patterns risk entrenching parents and children in "coercive cycles" of interaction, mutually reinforcing one another over time (Scaramella & Leve, 2004). Empirical research in this area during early childhood is less clear. Studies that examine transactional processes between parenting behavior and young children's socioemotional outcomes often find stability in mothers' and children's behaviors across time, but find stronger parent-effects on future child behavior than vice versa. For example, Scaramella and colleagues (2008) found stability in mothers' harsh responses to toddler noncompliance and toddler distress across child age 12 to 24 months, and mothers' harsh responses at 12 months predicted distress at 24 months, but distress at 12 months was unrelated to mothers' responses at 24 months. Conversely, distress was associated with declines in maternal support, but declines in maternal support were unrelated to future distress. Similarly, using interval sampling within a 30 minute series of structured play task, Del Vecchio and Rhoades (2011) found that after accounting for significant stability within their own behaviors across intervals, mothers' harsh discipline and toddlers' negative emotions (such as whining, crying, and screaming) influenced each others' subsequent behaviors; however, mothers' behaviors demonstrated a significantly stronger effect on subsequent child behaviors than vice versa. These results may be especially relevant for investigating emotion regulation in toddlers because although researchers conceptualize parent-child interactions as

reciprocal and transactional, children this age are heavily dependent on caregiver support in managing emotion regulation during the toddler years, perhaps suggesting stronger parental effects during this developmental period (Cole, 2003).

The Protective Role of Child Care

Given an ecological perspective, center-based child care is another important microsystem within which children engage in proximal processes with caregivers and the classroom environment, serving as an important caregiving context for the socioemotional development (Phillips & Lowenstein, 2011). High quality child care centers create developmentally appropriate environments by implementing rigorous standards of quality. High quality environments are characterized by *structural* elements such as small group sizes, low teacher-child ratios, and well-educated teachers, as well as *process* elements such as sensitive-responsive teacher-child interactions (Burchinal, Roberts, Riggin, Zeisel, Neebe, & Bryant, 2000). Decades of empirical evidence has demonstrated a significant contribution of high quality child care to socioemotional wellbeing such as increased emotional engagement, social competency, and fewer behavioral problems, with effects extending to middle childhood and adolescence (Burchinal & Cryer, 2003; Love et al., 2005; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network [ECCRN], 1998, 2001; Peisner-Feinberg et al., 2001; Watamura et al., 2011; Vandell, Belsky, Burchinal, Steinberg, Vandergrift, & NICHD ECCRN, 2010; Vogel et al., 2010; Votruba-Drzal et al., 2010). Moreover, longitudinal examinations of landmark high quality preschool programs for children from high-risk families, such as Perry Preschool and Abecedarian have documented program effects in adulthood such as increased high school graduate

rates, higher marriage rates, and lower rates of criminal activity, with may include improved emotion regulation as a mediator of these processes (Blair et al., 2012).

Empirical evidence also suggests that child care quality operates as a developmental asset for children facing environmental risk. Program effects of Early Head Start (including center-based and home-based program components), in which children received significantly higher quality care than children in the control group, are particularly strong for families with a medium level of demographic risk factors (Vogel et al., 2010). Socioeconomically disadvantaged boys and children who have mothers with low levels of education (i.e., a marker for socioeconomic disadvantage) also show particularly strong socioemotional gains in response to high quality preschool (Peisner-Feinberg et al., 2001; Votruba-Drzal et al., 2010). Moreover, an examination of data from the NICHD Study of Early Child Care and Youth Development (SECCYD) by Watamura and colleagues (2011) demonstrated the protective effect of high quality caregiver interactions for children facing risk at home. Sensitive-responsive caregiver-child interactions were observed across infancy in the home and in all non-maternal child care settings (i.e., formal child care as well as relative care). Children in low quality home, but high quality child care environments showed lower behavior problems and higher prosocial behaviors during early childhood as compared to children in low quality environments in both home and child care, who showed the worst outcomes.

Given the relatively recent focus on the domain of emotion regulation as a critical component of school readiness, less work has focused on the contribution of child care quality to this aspect of development (Blair et al., 2012); however, researchers are increasingly recognizing the important contribution child care may make to the

development of emotion regulatory skills (e.g., Denham et al., 2012; Mortensen & Barnett, 2015). Qualitative research has documented the nuanced, reciprocal interactions teachers facilitate with infants and toddlers to help them manage emotion in the classroom (Ahn, 2005; Lee, 2006), and quantitative investigations have demonstrated the importance of quality interactions within the classroom to emotional processes in related domains such as attachment security, self-regulated compliance, and cortisol reactivity (Ahnert, Pinquart, & Lamb, 2006; Feldman & Klein, 2003; Lisonbee, Mize, Payne, & Granger, 2008). Moreover, given the importance of regulatory processes as the foundation for other domains such as social competence, emotional understanding, peer relationships, and academic success (e.g., Calkins & Hill, 2006; Eisenberg et al., 2006; Leiw, 2012; Ursache et al., 2012), increased emotion regulation is likely one causal mechanism at the heart of the socioemotional gains associated with high quality child care (Blair et al., 2012). Given this, child care that is characterized by high quality environments and interactions with teachers, stands to play a critical role in the development of emotion regulatory processes, especially when risk to emotion regulation development from negative parenting behaviors is high.

The Present Study

The present study examined the reciprocal associations between young children's emotion regulation and mothers' negative parenting behaviors across three time points (child age 14 months, 24 months, and 36 months) in a sample of socioeconomically disadvantaged children who attended canter-based child care when they were 14 months old, and examined child care quality as a potential protective factor for these processes. Two primary research questions were addressed: 1) Do emotion regulation and negative

parenting reciprocally influence one another over time? 2) Does child care quality moderate the effect of negative parenting on emotion regulation? To the first research question, I anticipated that emotion regulation and negative parenting would be inversely associated within and across time, meaning that lower emotion regulation would elicit increased negative parenting from one time point to the next, and likewise, increased negative parenting would contribute to poorer emotion regulation. To the second research question, I anticipated that high quality child care at 14 months would serve as a protective factor for the deleterious effect of negative parenting on emotion regulation. As such, 14 months child care quality was examined as a moderator of the associations between 14 months negative parenting and 24 months and 36 months emotion regulation (hypothesized paths are illustrated in Figure 1).

Method

Data set. Data for this study were from the Early Head Start Research and Evaluation Project (EHSRE), a national program evaluation of Early Head Start (Love et al., 2002, 2004). EHS is a two-generation early intervention program designed to promote family partnership and child wellbeing for socioeconomically disadvantaged families with pregnant women, infants, and toddlers. Seventeen sites from around the U.S. participated in the evaluation. All recruited families met criteria for participation in EHS services. Eligible families were randomized to program (EHS-participating) and control (EHS-eligible) groups (N = 3,001). EHS-participating families received center-based, home-based, or a mix of services. Center-based programs provided all services to families through center-based child care and education programs, whereas home-based program provided all services via weekly home visits facilitated by trained home visitors.

Mixed approach programs provided a combination of center- and home-based services. Data were collected on parents, children, and other caregivers at baseline enrollment (between prenatal and 14 months postnatal) and at child age 14, 24, and 36 months. Data were collected in families' homes and other child care locations when applicable. A variety of measures were utilized, including parent reports, video observations, examiner ratings at home and in child care, and child care provider reports (a full report of recruitment, study design, and data collection procedures can be found in Love et al., 2002, 2004).

Sample. The present study included a subsample of EHS-participating and EHS-eligible families in which the focal child participated in center-based child care at the 14-month time point with available child care data ($N = 365$). Children were considered to have attended center-based child care as their primary care arrangement when their parents indicated attendance at a center-based facility for a minimum of 10 hours per week. Children with data for only one out of three time points for the main path model variables (emotion regulation and negative parenting) were excluded from analyses, resulting in a final sample of $N = 310$.

Seventy-six percent ($n = 237$) of this subsample were from the EHS program group. Within the EHS program group, children attended various types of centers depending on the type of EHS program they were enrolled in (i.e., center-based, home-based, or mixed). Children in center-based EHS programs attended EHS child care, children in home-based EHS programs were placed in contact with high quality community child care providers if parents wanted access to center-based child care, and mixed-approach programs either offered EHS child care or referred families to quality

providers. Children in the EHS control group (n = 73) attended non-EHS center-based programs that families sought out on their own.

Approximately 52% (n = 160) of the focal children were female, with 41% reporting as African American 34% Caucasian, 20% Hispanic, and 4% Other. This subsample differed from the EHSRE families (both program and control) who did not participate in center-based child care at 14 months in a few important ways. First, the subsample included a significantly higher percentage of EHS program families (75% versus 47%, $\chi^2 = 98.34$, $df = 1$, $p < .001$), which was to be expected. The subsample also included a significantly higher percentage of African American families (42% versus 34%) and a lower percentage of Hispanic families (20% versus 24%, $\chi^2 = 8.84$, $df = 3$, $p < .05$). The subsample had, on average, significantly fewer family risk factors at baseline enrollment (M = 2.46, SD = 1.19) than the other families (M = 2.66, SD = 1.19, $t(2952) = -3.01$, $p < .01$), as well as significantly lower reports of maternal depressive symptoms at 14 months (M = 11.38, SD = 8.77 versus M = 13.72, SD = 10.06, $t(519.77) = -4.47$, $p < .001$). Additionally, children in the subsample had significantly higher emotion regulation scores at 24 months (M = 3.72, SD = .78) than children who did not attend center-based care at 14 months (M = 3.62, SD = .80, $t(1908) = 2.05$, $p < .05$).

Measures.

Emotion regulation. Trained observers assessed children's emotion regulation abilities at 14, 24, and 36 months in the families' homes with the Emotion Regulation subscale of the Bayley Mental Development Index, Bayley Behavior Rating Scale (BBRS; Bayley 1993). Observers engaged children in developmental play tasks that assessed their ability to maintain attention and persist, cooperation, level of activity,

negativity, adaption to changes in test material, and hypersensitivity to test material. Children were rated along a 5-point scale on 7 items, with higher scores indicating better emotion regulation. Internal consistency scores at each time point for the full sample were high (Cronbach's $\alpha > .90$; Love et al., 2002). Scores are averages, with higher scores indicating better emotion regulation.

Negative parenting. At the 14, 24, and 36 month time points, trained observers assessed parenting behaviors with the 3-Bag Task (Love et al., 2002, 2004), an observational measure that was originally adapted from the NICHD Study of Early Child Care and Youth Development (SECCYD) Three-Box assessment of parent-child interactions (NICHD SECCYD, 1992). Mothers and children participated in a series of 10 minute, semi-structured play tasks in their home in which they were asked to interact with their children as they normally would, while playing with a series of toys in three separate bags. Interactions were video-recorded and coded on a 7-point scale for *intrusiveness* and *negative regard* towards the child, with higher scores indicating greater frequency and intensity of behaviors. A trained, independent coding team at the Center for Children and Families at Columbia University coded the video-recordings, and was trained to maintain an 85% minimum rate of agreement (Brady-Smith, O'Brien, Berlin, Ware, & Fauth, 2000). *Intrusiveness* measured the extent to which mothers exerted control over the child and the play task, rather than respecting the interests and pace of the child's play. *Negative regard* measured maternal expression of discontent, anger, disapproval, rejection of the child, and use of a negative tone, and physically harsh behaviors towards the child. Internal consistency for each behavior was high (Cronbach's $\alpha > .70$; Love et al., 2005). Correlations between intrusiveness and negative

regard were $r = .39$, $p < .0001$, $r = .57$, $p < .0001$, and $r = .42$, $p < .0001$ at 14, 24, and 36 months respectively. Scores within each time point were averaged to represent composite scores of negative parenting at 14, 24, and 36 months, with higher scores representing greater frequency and intensity of negative parenting behaviors.

Child care quality. Child care quality was assessed in the children's child care centers at the 14 month time point with the Caregiver Interaction Scale (CIS; Arnett, 1989) and the Infant/Toddler Environmental Rating Scale (ITERS; Harms, Cryer, & Clifford, 1990). Observers were trained in both measures by Mathematica Policy Research, and were required to meet an 80% minimum rating agreement during training to be certified to collect classroom data (Love et al., 2004). Observers used the CIS to rate *teacher sensitivity* from 1 (*item is not at all characteristic of this caregiver*) to 4 (*item is very much characteristic of this caregiver*) on 26 items that assessed the extent to which teachers displayed warmth (*positive* behaviors), were uninvolved and uninterested (*detached* behaviors), were hostile, threatening, or critical (*punitive* behaviors), and were lax towards children's misbehavior (*permissive* behaviors). Appropriate items were reverse scored such that all items indicated more favorable behaviors. Items were averaged such that higher scores reflect a higher degree of *teacher sensitivity.* Internal consistency for the CIS is generally reported as high across all behaviors (Cronbach's $\alpha >$ .70; Colwell et al., 2013). Trained observers also used the ITERS to assess multiple dimensions of *classroom quality*: furnishings and display for children, personal care routines, listening and talking, learning activities, interaction and program structure (the items for adult needs were not included in this study; Love et al., 2004). Scores for 33 items were assigned along a 7-point scale with 1 described as *inadequate care*, 3 as

minimal care, 5 as *good care*, and 7 as *excellent care*. Scores were averaged, with higher scores reflecting better *classroom quality*. Mean scores on the ITERS ($M = 4.54$, $SD = 1.23$) and CIS ($M = 3.35$, $SD = .43$) indicated that on average, children received relatively good care. Scores on the CIS and ITERS were significantly correlated ($r = .72$, $p < .001$). Scores on both measures were standardized to *z*-scores then averaged, with higher scores representing better child care quality.

Covariates. Demographic characteristics were included as control variables in all analyses. Additionally, other characteristics such as accumulative family risk, maternal depression, and child negative emotionality were included as well, as these factors are risk factors for increased negative parenting behaviors and regulatory difficulties (Conger & Donnellan, 2007; Kim & Kochanska, 2012; Matthews, Pointz, & Morrison, 2009; O'Brein Caughy, Huang, & Lima, 2009).

Demographics. EHS participation was indicated as 1 = program, 0 = control. *Child sex* was indicated as 1 = male, 0 = female. *Ethnicity* was reported as Caucasian, African American, Hispanic, or Other, which was indicated with three dummy variables with Caucasian as the reference group.

Family risk. The original EHSRE research team computed accumulative risk based on five dichotomous indicators assessed at baseline enrollment of the study: use of government assistance, adolescent childbearing (of the focal child), unemployment, maternal education less than high school, and single parent status (Love et al., 2002). Families were assigned a score of 1 in the presence of each risk factor. Scores were summed, creating an index of family risk ranging from 0 (*no risk*) to 5 (*high risk*).

Maternal depression. Maternal depression was assessed at 14 months with the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). Mothers reported on 20 items assessing how many days in the past week they experienced particular symptoms, including poor appetite, loneliness, sadness, lack of energy and restless sleep. Mothers indicated responses from 1 (*rarely*) to 4 (*most days*). Appropriate items were reverse-scored then items were summed so higher scores indicate more self-reported depressive symptoms. Internal consistency across all ethnicities is high (Cronbach's $\alpha > .88$; Love et al., 2005).

Child negative emotionality. At the 14 month time point, mothers reported degree of child negative emotionality with the Emotionality subscale of the Emotionality, Activity, Sociability, and Impulsivity Temperamental Survey for Children (EASI; Buss & Plomin, 1984). Mothers rated their children along a 5-point scale on 5 items that assessed their children's tendency to become easily and intensely aroused. Internal consistency for this measure in the EHSRE sample is high (Cronbach's $\alpha = .72$; Berlin, Ispa, Fine, Malone, Brooks-Gunn, Brady-Smith et al., 2009). Appropriate items were reverse scored. Scores are sums, such that higher scores reflect a higher degree of negative emotionality.

Analytic strategy. Path model analyses were conducted in Mplus 7.0 with full information maximum likelihood estimation (FIML; Muthén & Muthén, 1998-2012). Path analyses allow for the simultaneous estimation of multiple linear associations, including associations that represent stability within each domain (emotion regulation and negative parenting), as well as transactional associations from one domain to the other across multiple time points (Finkel, 1995; Selig & Little, 2012). Stability is represented

with autoregressive paths connecting the repeated measures of each domain. Coefficients refer to the relative ranking of cases (i.e., higher scores at time 1 are associated with higher scores at time 2), with coefficients closer to 1.0 indicating high stability in individual differences from one time point to the next (Finkel, 1995). Transactional associations are represented with cross-lagged paths connecting one domain to the other across time points. In this case, for example, cross-lagged coefficients represent the unique association of negative parenting at time 1 with emotion regulation at time 2, controlling for the autoregressive (i.e., stability) effect of time 1 emotion regulation, and so on (Selig & Little, 2012). Model fit was evaluated with chi-square (χ^2), the comparative fit index (CFI), and root-mean-square error of approximation (RMSEA). Non-significant χ^2 ($p > .05$) and commonly used cut-off values of .95 for CFI and .06 for RMSEA indicated good model fit (Hu & Bentler, 1999; Kline, 2011). Nested models were evaluated with the χ^2 difference test, in which a significant $\Delta\chi^2$ indicated that the model with more freely estimated parameters fit the data better than the model in which the same parameters were fixed to zero, and non-significant $\Delta\chi^2$ indicated that models fit equally well (Kline, 2011).

All estimated models included emotion regulation and negative parenting at 14, 24, and 36 months (see Figure 1 for an illustration of hypothesized paths). Throughout all analyses, all main path model variables were regressed on all of the control variables (EHS participation, child sex, ethnicity, family risk, maternal depression, child negative emotionality). Within-time associations between emotion regulation and negative parenting were specified as well. Two models were estimated to address study hypotheses. The first model examined the autoregressive and cross-lagged associations

between emotion regulation and negative parenting. Autoregressive paths from 14 – 24 – 36 months estimated stability within each domain, cross-lagged paths from 14 – 24 months, 14 – 36 months, and 24 – 36 months estimated the effects of negative parenting on emotion regulation (i.e., mother-effects), and reciprocal cross-lagged paths estimated the effects of emotion regulation on negative parenting (i.e., child-effects). Model fit was assessed along the way to examine the contribution of autoregressive, mother-effect and child-effect paths to the model.

The second model examined the moderating effect of child care quality on the mother-effects paths from 14 months negative parenting – 24 months emotion regulation and 14 months negative parenting – 36 months emotion regulation (see Figure 1 for an illustration of hypothesized moderated paths). Moderation was tested by including child care quality as a predictor of emotion regulation at each time point, then including a variable representing the interaction between quality and 14 months negative parenting as a predictor of 24 and 36 months emotion regulation. Interactions were the multiplicative product of the standardized values (*z*-scores) of child care quality and negative parenting. Using the online computational tool developed by Preacher, Curran, and Bauer (2006), significant interactions were decomposed by plotting the association between the independent variable (negative parenting) and dependent variable (emotion regulation) at meaningful levels (mean, +/- 1*SD*) of the moderator (child care quality), and testing significance of the simple slopes (Aiken & West, 1991).

Missing data rates across time were 4%, 7%, 14% for emotion regulation and 6%, 8%, 15% for negative parenting at the 14 months, 24 months, and 36 months time points respectively. Missing data rates for all other variables were low (< 5%) or zero. Missing

data were handled with FIML, in which information from all participants was included by estimating parameters based on available data and implied values of missing data given the associations between variables in the available data (Schlomer, Bauman, & Card, 2010).

Results

Descriptives and bivariate correlations. Full descriptive statistics and correlations of all study variables are presented in Table 1. Mean scores for emotion regulation increased at each time point, whereas mean scores on negative parenting decreased at each time point. Given the 7-point scales (ranging from 1 to 7) used to measure intrusive and negative regard maternal behaviors, mean scores for negative parenting were relatively low (M = 2.02, 1.72, and 1.40 at 14, 24, and 36 month time points respectively). Scores on emotion regulation were significantly positively correlated across each time point. Scores on negative parenting were significantly positively correlated across each time point as well. Bivariate correlations indicated significant inverse associations between emotion regulation and negative parenting within and across every time point, with the exception of the association between 24 months emotion regulation and 36 months negative parenting. Children in the EHS program group were more likely to be in higher quality child care than children in the control group, but child care quality was unrelated to emotion regulation and negative parenting at each time point.

Emotion regulation and negative parenting. The first path model estimated the autoregressive and cross-lagged paths between emotion regulation and negative parenting. All path models included within-time associations between the variables and

accounted for all covariates. To build the path model, the autoregressive paths across each domain were estimated first, $\chi^2 = 32.23(8)$, $p < .001$, CFI = .903, RMSEA = .099. Including the cross-lagged paths from negative parenting to emotion regulation (i.e., mother-effects) significantly improved the model $\Delta\chi^2 = 19.21(3)$, $p < .001$, CFI = .968, RMSEA = .072, as did the addition of the cross-lagged paths from emotion regulation to negative parenting (i.e., child effects), $\Delta\chi^2 = 18.72(3)$, $p < .001$, CFI = 1.00, RMSEA = .00. Standardized beta coefficients for the final model ($\chi^2 = .49(2)$, $p = .78$, CFI = 1.00, RMSEA = .00) are presented in Figure 2.

Autoregressive paths for emotion regulation indicated relatively low stability from 14 – 24 months ($\beta = .17$ $p < .01$). That is, the relative ranking of a child's emotion regulation score at 14 months was predictive of their relative ranking at 24 months, but the association was of low magnitude. Moderate stability was seen from 24 – 36 months ($\beta = .32$, $p < .001$). Autoregressive paths for negative parenting indicated a similar pattern with significant but low stability from 14 – 24 months ($\beta = .19$, $p < .01$) and moderate stability from 24 – 36 months ($\beta = .33$, $p < .001$). Emotion regulation and negative parenting were inversely associated at 14 months ($r = -.15$, $p < .01$), but within-time associations at 24 months and 36 months were not significant.

Significant cross-lagged paths emanated from the 14 months time point exclusively. Higher observed 14 months negative parenting predicted lower 24 months emotion regulation, independent of the stability effect of 14 months emotion regulation. The only significant reciprocal paths were from 14 – 36 months. After accounting for all autoregressive and cross-lagged paths, higher observed 14 months negative parenting remained a significant predictor of low 36 months emotion regulation ($\beta = -.20$, $p < .01$).

Likewise, low 14 months emotion regulation scores remained a significant predictor of higher observed 36 months negative parenting (β = -.19, p < .01).

Child care quality as a moderator of mother-effects. The second model examined the potential protective role of high quality child care at 14 months on the effect of negative parenting on emotion regulation (i.e., mother-effects paths emanating from 14 months negative parenting). Paths specifying 14 months child care quality as predictors of emotion regulation at each time point, and paths specifying the interaction term (14 months negative parenting X 14 months child care quality) as a predictor of 24 months and 36 months emotion regulation were introduced to the model. The model fit the data well χ^2 = 5.32(9), p = .81, CFI = 1.00, RMSEA = .00; however, constraining the new paths to zero did not result in a significant decrement in model fit ($\Delta\chi^2$ = 2.79(5), p = .73, CFI = 1.00, RMSEA = .00), indicating that the model fit the data equally well without the paths. As such, child care quality was not directly associated with emotion regulation at 14 months (β = -.04, p = .53), 24 months (β = .07, p = .26), or 36 months (β = .01, p = .85). The interaction term was not predictive of emotion regulation at 24 months (β = -.02, p = .70) or 36 months (β = -.05, p = .37).

Discussion

The aim of the present study was to examine the reciprocal nature of emotion regulation and negative parenting in a sample of high-risk infants and toddlers who attended center-based child care, and to consider the protective effect of child care quality in attenuating the deleterious effects of negative parenting on subsequent emotion regulation. Given an ecological and transactional perspective of proximal processes in multiple microsystems, I anticipated that emotion regulation and negative parenting

would be inversely associated within and across time, with increased negative parenting associated with decreased emotion regulation. I also expected that high quality child care at 14 months would moderate the impact of 14 months negative parenting on future emotion regulation. Support for study hypotheses was mixed.

The results from the initial path model demonstrated the importance of accounting for stability as well as cross-lagged effects between mothers and children to understand the associations between emotion regulation and negative parenting across time. Autoregressive paths showed significant, yet modest stability within each domain; path coefficients were relatively low from 14 to 24 months time, and modest from 24 to 36 months. These low to modest coefficients suggest considerable individual variation in change in emotion regulation and negative parenting across time, especially from 14 to 24 months; that is, the relative rankings of individual scores across time was subject to individual variation. Cross-lagged paths that specified mother-effects of negative parenting, as well as cross-lagged paths that specified child-effects of emotion regulation, both made significant contributions to the model, demonstrating the importance of considering the reciprocal and transactional nature of these processes. Child care quality was unrelated to emotion regulation, both as a direct association and as a protective factor for the effect of negative parenting on emotion regulation. Results are discussed in detail below, in terms of the significance of the 14 months time point as a predictor of future outcomes, as well as the unexpected finding that child care quality was unrelated to these processes.

The power of early parent-child interactions. Rather than demonstrate cross-lagged effects across each time point as hypothesized, all significant cross-lagged paths

emanated from 14 months emotion regulation and negative parenting. Additionally, in contrast to the bivariate correlations, within-time correlations between negative parenting and emotion regulation did not explain any significant variation once the paths at earlier time points were accounted for. Negative parenting at 14 months was associated with decreased emotion regulation at 24 and 36 months. Likewise, lower observed 14 months emotion regulation remained the only significant child-effect, and was predictive of increased harsh parenting at 36 months.

These findings suggest the power of parent-child interactions during early toddlerhood in setting the stage for increased negative parenting behaviors and poorer emotion regulation as children enter the preschool years. By 24 months, increasingly advanced physical and cognitive skills fuel desire for autonomy, yet limitations with language and attempts to execute behaviors that outpace their abilities lead to frustrations; as such, negative responses from parents that attend to developmentally appropriate behavior and emotional transgressions tend to increase across toddlerhood (Kim, Pears, Fisher, Connelly, & Landsverk, 2010). In comparison, 14-month-old toddlers are more limited in their abilities and desire for autonomy. During this time, the transition from external to internal regulatory control is just emerging, as well as physical and cognitive capabilities that facilitate strategies for regulation (Calkins & Hill, 2006; Fox & Calkins, 2003). Negative parenting behaviors characterized as harsh, punitive, and intrusive may be an especially poor match for the developmental needs of this young age, resulting in stronger effects on future regulation skills than if these behaviors occur later. Younger toddlers require a high degree of scaffolding from caregivers, and children who experience negative parenting during this transition may have lasting emotion regulation

deficits that in turn contribute to greater exposure to negative parenting over time. Likewise, while it is to be expected that younger toddlers have more limited emotion regulation skills, those with especially poor skills at a young age pose additional stress and caregiving challenges to parents, eliciting more harsh and intrusive behaviors in the future (Cole, 2003).

The protective role of child care? Contrary to study hypotheses, child care quality at 14 months was not associated with emotion regulation at any time point. Beyond the absence of a direct association between child care quality and emotion regulation, child care quality also did not play a significant role as hypothesized for those experiencing high levels of negative parenting, as the statistical interaction of child care quality and negative parenting at 14 months was not significant in predicting emotion regulation at 24 or 36 months. These findings were unexpected given the large body of evidence that suggests the important role of high quality child care in socioemotional development, especially for children facing risk (Burchinal & Cryer, 2003; Love et al., 2005; NICHD ECCRN 1998, 2001; Peisner-Feinberg et al., 2001; Watamura et al., 2011; Vandell et al., 2010; Vogel et al., 2010; Votruba-Drzal et al., 2010). Several explanations are possible for these findings. First, current understanding of the role of child care in the development of emotion regulation rests on the assumption that emotion regulation processes are the underlying foundation for other socioemotional skills that have demonstrated associations with child care quality (Blair et al., 2012); however, it is possible that the associations between child care quality, parenting, and emotion regulation represented in these analyses (i.e., direct and interactive associations from 14 months experiences) may not accurately depict the way in which experiences in quality

child care facilitate regulatory skills, especially in the context of negative parenting. For example, a protective effect of child care quality may be the result of multiple years of high quality child care across toddlerhood; one year of high quality child care may not be enough to override the influence of negative parenting experiences at home, especially in the context of a low-income sample experiencing other socioeconomic risk factors. Further, there may be considerable variability in the quality of child care over time such that quality at 14 months may not be indicative of earlier or later child care exposure. Longitudinal examinations of the NICHD SECCYD have aggregated non-maternal caregiving quality from child age 6 to 54 months, representing a much longer exposure time to an additional sensitive child care context, and more potential to operate as a significant predictor of children's development (e.g., Watamura et al., 2011; Vandell et al., 2010). Relatedly, a crucial consideration in all panel model analyses, the discrete time points represented by the different data collection time points may not be the correct "set points" between transactions to adequately capture significant effects (Gershoff et al., 2009). For example, the protective effect of child care quality may emerge at time points much later than 36 months, or cross-lagged effects may be seen within time points that are closer together (or further apart) than those represented here.

Finally, ecological and transactional theories posit proximal, reciprocal interactions as the mechanisms that drive development. The measures used in this study to capture represent child care quality, the CIS and ITERS, actually represent quality captured at the classroom level. That is, teachers and the environment are assessed across the entire classroom, not the level of each child within the classroom. Measures such as these may not be reflective of the theorized proximal processes that are involved in the

development of emotion regulation, especially given the large emphasis on the inter-personal nature of the domain (Mortensen & Barnett, 2015). Researchers have suggested that classroom-level measures of child care quality may misrepresent individual children's experiences (Hallam et al., 2009; Katz, 1994; Melhuish, 2001). For example, observations of individual preschool children's experiences with different classroom quality indicators have found that not all children in high quality classrooms have high quality experiences (e.g., Jeon, Langill, Carla, Luze, Carta, & Atwater, 2010). Documenting observed interactions within the classroom that are reflective of children's lived experiences may reveal a different story.

Limitations and future directions. There are some important limitations of this study to consider, which also provide opportunity for future directions for research in this area. First, it's important to consider that the cross-lagged effects from 14 to 36 months represent one transaction, thus more time points are needed to see if cross-lagged associations are replicated across time, representing true coercive cycles of parent-child interactions (e.g., Scaramella & Leve, 2004). Additionally, it is important to consider that the lack of cross-lagged paths from 24 months could be a function of the time points selected for the path model; these discrete time points may not represent the times at which transactions between emotion regulation and negative parenting behaviors can be captured (Gershoff et al., 2009). It will be important to extend this work with time points through early childhood. Additionally, as discussed above, examining child care quality only at the 14 months time point is limiting in terms of understanding the potential role of child care in these processes. Testing additive effects of multiple years of child care, or testing cross-lagged associations between children and the same teacher over repeated

time points may capture a direct association of high quality child care on facilitating emotion regulation, as well as a protective factor for negative parenting.

Conclusions

The reciprocal and transactional processes between parents and children provide an important context for the development of emotion regulation. Negative parenting threatens to undermine these processes, thus it is important to consider sources of support from other caregiving settings, such as high quality center-based child care. Negative parenting and poor emotion regulation during early toddlerhood may be particularly significant in setting the stage for reciprocal interactions that fuel increases in negative parenting and maladaptive emotion regulation development, but more research is needed to understand the potential role of high quality child care in serving young children and families, especially those who may be at a heightened risk for establishing coercive cycles of parent-child interactions.

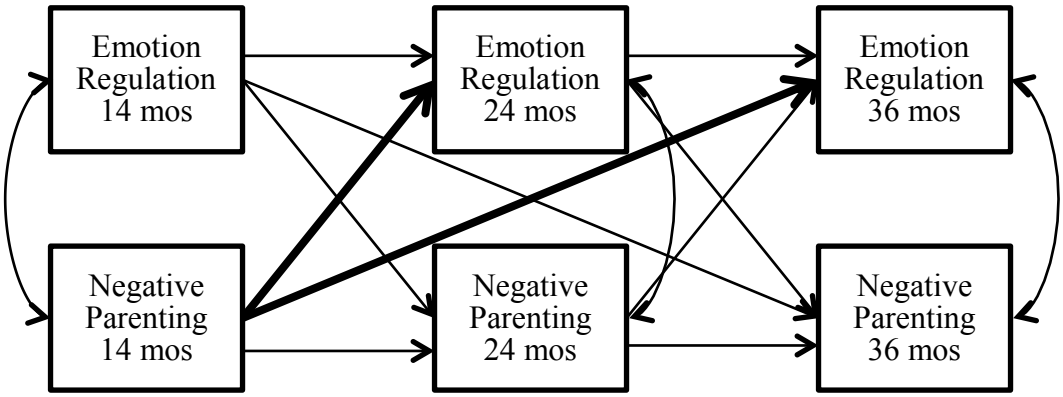
Table 1

Bivariate correlations and descriptive statistics of study variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. EHS program = 1[a]	--														
2. Child is male = 1[b]	.05	--													
3. African American = 1[c]	.09	-.02	--												
4. Hispanic = 1[c]	.01	-.01	-.43***	--											
5. Other = 1[c]	-.14*	-.01	-.16**	-.10	--										
6. Family risk	.06	-.02	.09	-.04	-.01	--									
7. Child negative emotionality	.11	.06	.16**	-.08	-.05	.14*	--								
8. Maternal depression	-.01	.01	.01	-.05	-.05	.08	.16**	--							
9. Emotion regulation 14mo	-.02	-.16**	-.10	.14*	.07	-.02	-.16**	-.09	--						
10. Emotion regulation 24mo	-.01	-.17**	-.02	.12*	.05	-.09	-.13*	-.07	.25***	--					
11. Emotion regulation 36mo	-.01	-.23***	.04	-.01	.04	-.09	-.03	-.18**	.15*	.38***	--				
12. Negative parenting 14mo	-.01	.18**	.22***	-.07	-.05	.14*	.15**	.10	-.21***	-.21***	-.30***	--			
13. Negative parenting 24mo	.12*	.08	.28***	-.13*	.05	.22**	.11	.08	-.16**	-.17**	-.18**	.29***	--		
14. Negative parenting 36mo	.01	.04	.27***	-.11	-.02	.16**	-.02	.03	-.23***	-.09	-.15*	.20**	.41***	--	
15. Child care quality 14mo	.34***	-.03	.05	-.03	-.06	-.01	-.01	-.10	-.03	-.05	.04	.02	.00	.03	--
M						2.41	2.88	11.24	3.70	3.73	3.96	2.02	1.72	1.40	.03
SD						1.14	.98	8.86	.65	.78	.79	.89	.87	.55	.93

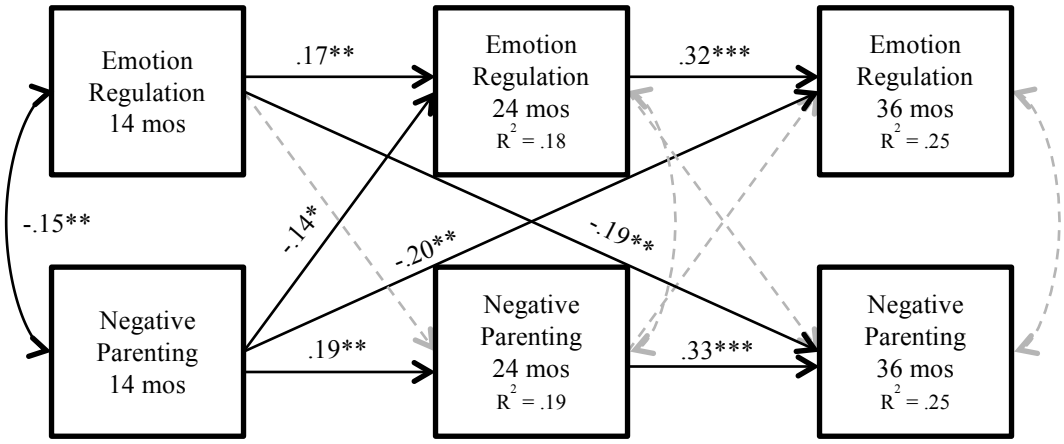
Notes. [a] 0 = Control, [b] 0 = child is female, [c] 0 = reference group is Caucasian

*$p < .05$, **$p < .01$, ***$p < .001$



Notes. Bold paths represent associations hypothesized to be moderated by 14mo child care quality

Figure 1
Hypothesized path model



Notes. $\chi^2 = .49(2)$, $p = .78$, CFI = 1.00, RMSEA = .00. Dashed lines represent non-significant paths. Path coefficients are standardized beta coefficients. *$p < .05$, **$p < .01$, ***$p < .001$

Figure 2
Path analysis results of emotion regulation and negative parenting

CHAPTER III: THE INTERACTION OF TEACHER SENSITIVITY, MATERNAL SUPPORT, AND INFANT NEGATIVE EMOTIONALITY IN THE DEVELOPMENT OF EMOTION REGULATION IN CHILD CARE

The emotion regulation skills young children gain across infancy and toddlerhood are critical for socioemotional wellbeing and academic success (Blair et al., 2012; Calkins & Hill, 2006; Eisenberg et al., 2006; Liew, 2012; Ursache et al., 2012). Emotion regulation develops within the context of parent-child relationships, and can be hindered when support and sensitivity from parents are minimal (Bocknek et al., 2009; Brady-Smith et al., 2013; Calkins et al., 1998; Chazan-Cohen et al., 2009; Grolnick & Faraks, 2002; Morris et al., 2011). Center-based child care serves as a source of support for young children, as it provides an additional context for sensitive caregiving from a trained teacher (Hamre, 2014; Jones Harden et al., 2012). High quality child care is associated with a variety of prosocial outcomes (Burchinal et al., 2008; Love et al., 2003, Love et al., 2005; NICHD EECRN, 1998, 2001; Peisner-Feinberg et al., 2001; Phillips & Lowenstein, 2011; Vogel et al., 2010); however, empirical evidence of the exact role teacher sensitivity in center-based infant/toddler child care plays in the development of emotion regulation is limited (Blair et al., 2012; Mortensen & Barnett, 2015). It is important to understand if teacher sensitivity serves as a developmental asset for children, including acting as a buffer for those at risk for poor emotion regulation due to unsupportive parenting. Additionally, according to the differential susceptibility hypothesis (Belsky & Pluess, 2009), differences in infant temperamental reactivity place certain children more susceptible to variation in caregiving experiences at home (Bradley & Corwyn, 2008; Kim & Kochanska, 2012; Pluess & Belsky, 2010) and child care

(Phillips, Crowell, Sussman, Gunnar, Fox, Hane et al., 2012; Pluess & Belsky, 2009, 2010). Therefore, it is important to clarify *for whom* teacher sensitivity in child care, both as a direct effect and protective factor for risk at home, is most vital (Phillips, Fox, & Gunnar, 2011).

To elucidate these processes, the present study utilized data from the Early Head Start Research and Evaluation Project (EHSRE; Love et al. 2002, 2004) to examine trajectories of emotion regulation for infants and toddlers in center-based child care. The EHSRE Project includes socioeconomically disadvantaged families either participating in or eligible for EHS services. Particular attention needs to be focused on processes linking the quality of care at home and in child care to the development of emotion regulation for children living in disadvantaged environments, as the stressors associated with living in poverty often intensify maladaptive parenting behaviors, increasing the risks for compromised child adjustment (Bradley & Corwyn, 2002; Conger, Conger, & Martin, 2010). Participation in high-quality early care and education services is intended to boost child development among disadvantaged families, yet the specific role of the quality of child-teacher interactions, that is the sensitivity displayed by child care teachers when interacting with individual children, in infant/toddler center-based care settings, remains under-studied (Mortensen & Barnett, 2015). The present analyses focused on the role of teacher sensitivity in infant/toddler center-based child care in the development of emotion regulation across time. The direct and interactive effects of teacher sensitivity and maternal supportiveness were considered, as well as individual variation in these processes due to infant temperamental reactivity.

Theoretical Framework

Bioecological theory (e.g., Bronfenbrenner & Morris, 2006) provides a contextual framework for considering the importance of multiple caregiving settings as influential in promoting emotion regulation. First, bioecological theory stresses the importance of multiple *microsystems* in children's lives, which include proximal environments such as home and child care. Second, bioecological theory defines *proximal processes*, repeated or regular bidirectional interactions that occur between the individual and the environment, as the "primary mechanisms producing human development" (Bronfenbrenner & Morris, 2006, p. 795). From this perspective, the proximal processes that occur between children and multiple caregivers (i.e., parents and teachers), in multiple microsystems (i.e., home and child care), are the catalysts for emotion regulation development. Finally, bioecological theory emphasizes the role of *person characteristics* as influential in the nature and quality of proximal processes. Children are active agents in their own development, thus early appearing characteristics such as temperamental reactivity influence the types of responses elicited from caregivers, as well as children's susceptibility to different caregiving experiences (Belsky & Pluess, 2009). It is from this perspective that I examined teacher sensitivity, maternal supportiveness, and infant temperamental reactivity in the development of emotion regulation for EHS-participating and EHS-eligible infants and toddlers in center-based child care.

The Development of Emotion Regulation in Early Childhood

Emotion regulation refers to the self-regulatory processes children engage in to effectively adapt their emotions to a given situation (Eisenberg et al., 2006). Eisenberg and colleagues (2006) define emotion regulation as "processes used to manage and

change if, when, and how (e.g., how intensely) one experiences emotions…as well as how emotions are expressed behaviorally" (p. 288). Distinct from emotional arousal, emotion regulation involves cognition and behavior (Cole et al., 2004). Across infancy and toddlerhood, young children shift from relying on external forms of emotion regulation (e.g., soothing from caregivers), to maintaining internal regulatory control (Grolnick & Farkas, 2002). As young children become increasingly competent at managing their emotions (as well as making gains physically and cognitively), they are able to execute a wide range of complex social behaviors. The emotion regulation skills that develop across infancy and toddlerhood are critical for future social competence, empathy, emotional understanding, and peer relations in early childhood (Blair et al., 2012; Calkins & Hill, 2006; Eisenberg et al., 2006; Liew, 2012). Self-regulatory competency also prepares children to engage with teachers and students effectively in the classroom, placing them on pathways for academic success throughout elementary school (Liew, 2012; Ursache et al., 2012). Given a bioecological framework, caregivers support the development of emotion regulation by acting as a resource and source of support for young children by creating caregiving environments that are warm, supportive, and responsive (Cole et al., 2004; Grolnick & Farkas, 2002). In the present study, I consider both mothers and child care teachers as important caregivers that facilitate the development of emotion regulation through supportive and sensitive caregiving.

Maternal Supportiveness and Emotion Regulation

Much research has examined the development of emotion regulation within the context of mother-child interactions; in this sense, the quality of mother-child interactions and attachment security set the stage for the child to engage in effective emotion

regulation (Cole et al., 2004; Calkins & Hill, 2006). Young children's regulatory capabilities are supported when mothers use positive support, guidance, and attentional strategies to help manage feelings, whereas negative and controlling parenting behaviors impede development (Calkins et al., 1998; Grolnick & Faraks, 2002; Morris et al., 2011). Associations between observed maternal support (characterized as maternal behaviors that are sensitive, cognitively stimulating and positive) and emotion regulation are well documented in data from the EHSRE Project (Bocknek et al., 2009; Brady-Smith et al., 2013; Chazan-Cohen et al., 2009). Brady-Smith et al. (2013) used a person-centered approach to classify patterns of mothers' observed behaviors when children were 12 months. As compared to patterns of hash or directive (i.e., intrusive) parenting, patterns of supportive behavior at age 1 were strongly associated with better emotion regulation at ages 2 and 3 across all ethnic groups. In a latent growth model framework, Bocknek et al. (2009) compared trajectories of emotion regulation and observed maternal supportiveness from ages 1 to 3 in the EHSRE's subsample of African American families. After accounting for family risk, EHS treatment effects, infant temperament, and sex, on average, higher maternal supportiveness was significantly associated with better emotion regulation at each time point, and positive growth in maternal supportiveness was significantly associated with positive growth in emotion regulation across toddlerhood. Chazan-Cohen et al. (2009) extended analyses to pre-kindergarten, finding that better emotion regulation at age 5 was associated with higher maternal supportiveness at age 1 and positive change in maternal supportiveness across ages 1 to 5, independent of maternal depression, parental stress, and the home learning environment. Given a bioecological framework, for young children attending center-

based child care, it is essential to consider the proximal processes between teacher and children in this microsystem as well.

Teacher Sensitivity and Emotion Regulation

In the literature examining child care quality, *process quality* refers to the quality of proximal processes children have with adults in the classroom (as opposed to *structural quality*, which refers to center characteristics such as staff ratios, classroom group size, and teacher qualifications; Pianta, Howes, Burchinal, Bryant, Clifford, Early et al., 2005). Process quality is considered the strongest source of variation in the effect child care has on child development (Love et al., 2003; Phillips & Lowenstein, 2011), of which teacher sensitivity is a major component (Halle, Anderson, Blasberg, Chrisler, & Simkin, 2011; Hamre, 2014). High quality teacher-child interactions are associated with a variety of prosocial child behaviors, with influences enduring throughout elementary school (Burchinal et al., 2008; Love et al., 2005; Peisner-Feinberg et al., 2001; Vogel et al., 2010). For infants and toddlers in child care, teacher sensitivity is associated with increased teacher-child attachment security (Ahnert et al., 2006) and non-maternal caregiver sensitivity is associated with increased self-control, compliance and reduced behavior problems in preschool (NICHD EECRN, 1998), more positive and skilled peer interactions (NICHD EECRN, 2001), including reduced externalizing problems in adolescence (Vandell et al., 2010). The focus on emotion regulation as a unique domain of school readiness is relatively new, therefore associations between teacher sensitivity and emotion regulation are less well understood; however, as Blair and colleagues (2012) review, seminal preschool intervention programs such as Perry Preschool Project and Abecedarian Project show impressive longitudinal links between high quality child care

and reduced criminal behavior, increased marriage rates, and reduced externalizing behaviors, of which emotion regulation is a likely underlying mechanism.

For infants and toddlers living in poverty, which presents risks to parent-child interactions, high quality child care may be a particularly powerful developmental asset (Jones Harden et al., 2012; Phillips & Lowenstein, 2011). In this sense, teacher sensitivity serves as a protective factor for children facing risk at home. Evidence from the EHSRE data indicated that EHS program impacts were particularly strong for children with some family risk factors (e.g., adolescent childbearing, use of government assistance, unemployment, low maternal education), but not the highest level of risk (Vogel et al., 2010), however the exact role of teacher sensitivity in these processes is unclear. Focusing specifically on caregiver sensitivity in non-maternal child care across early childhood, recent analyses of the NICHD SECCYD data determined that high caregiver sensitivity, coupled with a poor home environment, was associated with improved child behavior problems and prosocial behaviors, whereas children who experienced low caregiver sensitivity and a poor home environment fared the worst (Watamura et al., 2011). Furthermore, preschool teacher sensitivity has been shown to buffer the negative association between observed maternal sensitivity and teacher-reported child externalizing problems in kindergarten (Hartz & Williford, 2014). There is a need to expand our understanding of the exact nature of the possible compensatory role of teacher sensitivity in infant/toddler center-based care for children whose emotion regulation development is threatened by risk at home.

Temperamental Reactivity and Emotion Regulation

The *differential susceptibility hypothesis* maintains that certain children are biologically predisposed to be more susceptible to both positive and negative environmental experiences (Belsky & Pluess, 2009). This susceptibility positions children to make substantial developmental gains in high quality environments, but face considerable developmental challenges in environments of minimal quality (Belsky & Pluess, 2009). From this perspective, young children will respond to caregiver sensitivity at home and child care in varying ways, with the emotion regulation of certain children faring better (or worse) in certain environments. Temperamental reactivity is a primary marker of differential susceptibility; a highly reactive temperament is the behavioral manifestation of the underlying physiological mechanisms that contribute to susceptibility to the environment (Belsky & Pluess, 2009; Phillips et al., 2011). Negative emotionality is one component of temperamental reactivity that is important to differential susceptibility (e.g., Belsky & Pluess, 2009; Pluess & Belsky, 2009, 2010; Kim & Kochanska, 2012), referring to patterns of distressed, intense, negative emotions (Buss & Plomin, 1984). Infants with high temperamental reactivity and high negative emotionality may act in ways that pose distinct challenges to caregivers; however, these infants stand to gain the most when caregivers are able to maintain sensitive and responsive behaviors. Empirical evidence supports these processes in home and child care caregiving settings, as temperamental reactivity has been shown to moderate links between caregiving experiences and socioemotional outcomes. For example, Pluess and Belsky (2010) found that the association between observed parenting quality across early childhood and children's social skills at age 11 was moderated by infant temperamental

reactivity, such that children with high reactivity were at risk for worse social skills when maternal sensitivity was low, but demonstrated the best outcomes when maternal sensitivity was high. Similar patterns of findings have been found with infant temperamental reactivity moderating the association between maternal sensitivity and child externalizing and internalizing behaviors (Bradley & Corwyn, 2008) and infant negative emotionality moderating the association between mother-child mutual responsivity and toddler self-regulation (Kim & Kochanska, 2012). Results are similar in child care settings. In non-maternal child care, compared to infants with low temperamental reactivity, infants with high temperamental reactivity have been shown to be more susceptible to the effect of observed child care quality on behavior problems at age 5 (Pluess & Belsky, 2009), behavior problems and teacher-child conflict at age 11 (Pluess & Belsky, 2010), and social integration in preschool (Phillips et al., 2012).

Taken together, this research underscores the importance of accounting for individual variation in the associations between caregiver quality and developmental outcomes. Little is known about these processes for the development of children's emotion regulation, especially in connection to teacher sensitivity in center-based child care. Moreover, even less is known about children's differential susceptibility to the protective role of teacher sensitivity for children facing risk at home. One study by Hartz and Williford (2014) reported a statistically significant interaction between maternal sensitivity, preschool teacher sensitivity and child negative emotionality in predicting teacher-reported internalizing problems in kindergarten. However, results were inconsistent with differential susceptibility, as children with high negative emotionality fared the same as children with low negative emotionality in the context of low maternal

sensitivity and high teacher sensitivity. While studies have found support for differential susceptibility by considering links between either parental sensitivity or child care teacher sensitivity and emotion regulation development, how the home and child care contexts interact to influence the development of emotion regulation has yet to be tested within a differential susceptibility framework.

The Present Study

The aim of the present study was to examine the impact of caregiver quality at home and in child care, in combination with infant negative emotionality, on the development of emotion regulation in a sample of socioeconomically disadvantaged children who attended center-based child care. Formal early care and education programs are uniquely positioned to provide trained support to young children and families, thus is it critical to examine teacher sensitivity and children's developmental processes within this setting (Hamre, 2014; Mortensen & Barnett, 2015). This study examined trajectories of emotion regulation from child-age 14 to 24 to 36 months, and tested the direct and interactive effects of 14 month maternal supportiveness, teacher sensitivity, and infant negative emotionality on individual variability in emotion regulation at 14 months (i.e., intercept), and development across time (i.e., slope). Three research questions guided this study: 1) Do maternal supportiveness and teacher sensitivity at 14 months explain unique individual variation in initial emotion regulation at 14 months and development across time? 2) Do the interactive associations between maternal sensitivity x teacher sensitivity, maternal sensitivity x infant negative emotionality, and teacher sensitivity x infant negative emotionality explain individual variation in initial emotion regulation and development across time? 3) Does the

interactive association between maternal sensitivity x teacher sensitivity x infant negative emotionality explain individual variation in initial emotion regulation and development across time?

I anticipated that sensitivity in different caregiving contexts (home and child care) would be uniquely positively associated with individual variation in initial emotion regulation (i.e., intercept) and development across time (i.e., slope). I also anticipated that high teacher sensitivity in child care would be especially promotive for emotion regulation when maternal supportiveness at home was low (maternal supportiveness x teacher sensitivity). In addition, in line with the differential susceptibility hypothesis, I anticipated that highly reactive infants would be more susceptible to variation in supportiveness at home (maternal supportiveness x infant negative emotionality) and child care (teacher sensitivity x infant negative emotionality), with highly reactive infants displaying higher initial emotion regulation and steeper rates of growth in the presence of high sensitivity and lower initial emotion regulation and slower rates of growth in the presence of low sensitivity. Finally, I anticipated that maternal sensitivity, teacher sensitivity, and infant negative emotionality would have a unique interactive association on emotion regulation as well. In line with the differential susceptibility hypothesis, I anticipated that highly reactive infants would show higher initial emotion regulation and steeper rates of growth when they had high sensitive caregiving in both caregiving contexts, and lower initial emotion regulation and slower rates of growth when they had low sensitivity in both contexts. I also expected that highly reactive infants experiencing low maternal sensitivity would stand to gain the most in terms of growth in emotion regulation from a highly sensitive teacher at child care.

Method

Data for this study were from the Early Head Start Research and Evaluation Project (EHSRE; Love et al., 2002; 2004). The EHSRE is a national, experimental evaluation of Early Head Start, a two-generation early intervention program designed to promote family partnership and children's development and health for socioeconomically disadvantaged families with pregnant women, infants, and toddlers. Seventeen sites from around the U.S. participated in the evaluation. All recruited families met criteria for participation in EHS services. Eligible families were randomized in to program (EHS-participating) and control (EHS-eligible) groups (N = 3,001). EHS-participating families received center-based, home-based, or mixed approach services. Center-based programs provided all services to families through center-based child care and education programs, whereas home-based program provided all services via weekly home visits facilitated by trained home visitors. Mixed approach programs provided a combination of center- and home-based services. Data were collected on parents, children and other caregivers at baseline enrollment (between prenatal and 14 months postnatal) and when the child was 14, 24, and 36 months old. Data were collected in families' homes and (if applicable) other child care locations. A variety of measures were utilized, including parent reports, video observation, examiner ratings, and child care provider reports (a full report of recruitment, study design, and data collection procedures can be found in Love et al., 2002, 2004).

Sample. The present study includes a subsample of EHS-participating (i.e., program) and EHS-eligible (i.e., control) families who participated in center-based child care at the 14 month time point with available child care data (n = 365). Children were

considered to have attended center-based child care when their parents indicated that they attended a center-based facility for a minimum of 10 hours per week. This subsample is comprised of n = 273 families from the EHS program group and n = 92 families from the control group. Within the EHS program group, children attended various types of centers depending on the type of EHS program they were enrolled in (center, home, or mixed). Children in center-based EHS programs attended EHS child care, whereas children in home-based EHS programs were connected with high quality community child care providers, or families found child care on their own (Love et al., 2004). Some mixed approach EHS programs offered EHS child care and others referred families to quality community child care providers. Within the control group, all children attended non-EHS center-based programs.

The entire subsample includes n = 179 male and n = 186 female children, with 34% of families reporting as Caucasian, 41% African American, 20% Hispanic, and 4% other. This subsample differs from the EHSRE families who did not participate in center-based child care at 14 months in a few important ways. First, this subsample included a higher percentage of families from the EHS program group (74%) as compared to the rest of the sample (47%, $\chi^2 = 98.33$, $df = 1$, $p < .001$), as well as a higher percentage of African American families (41% versus 33%) and a lower percentage of Hispanic families (20% versus 24%, $\chi^2 = 8.84$, $df = 3$, $p < .05$). On average, the families in the subsample had significantly fewer demographic risk factors ($M = 2.46$, $SD = 1.15$) than the families who did not participate in center-based child care ($M = 2.66$, $SD = 1.19$, $t(480.45) = 3.10$, $p < .01$). Additionally, on average, children in the subsample had significantly lower emotion regulation scores at 24 months ($M = 3.62$, $SD = .80$) than the

children who did not participate in center-based child care at 14 months ($M = 3.72$, $SD = .78$, $t(420.91) = -2.08$, $p < .05$).

Measures.

Emotion regulation. At 14, 24, and 36 month time points, trained researchers assessed children's emotion regulation abilities with the Emotion Regulation subscale of the Bayley Mental Development Index, Bayley Behavior Rating Scale (BBRS; Bayley, 1993). This instrument has been used to measure observed emotion regulation development in other research with the EHSRE data (e.g., Bocknek et al., 2009; Brady-Smith et al., 2013). Children were rated along a 5-point scale on 7 items that assessed ability to maintain attention and persist during tasks, cooperation, level of activity, negativity, adaption to changes in testing material, and hypersensitivity to test material. Internal consistency scores at each time point were high (Cronbach's $\alpha > .90$; Love et al., 2002). Scores are averages, with higher scores indicating better emotion regulation.

Negative emotionality. At the 14 month time point, mothers reported degree of child negative emotionality with the Emotionality subscale of the Emotionality, Activity, Sociability, and Impulsivity Temperamental Survey for Children (EASI; Buss & Plomin, 1984). Mothers rated their children along a 5-point scale on 5 items that assessed their children's tendency to become easily and intensely aroused. Internal consistency for this measure in the EHSRE sample is high (Cronbach's $\alpha = .72$; Berlin et al., 2009). Appropriate items were reversed scored. Scores are sums, such that higher scores reflect a higher degree of negative emotionality

Maternal support. At the 14 month time point, trained observers assessed maternal support with the 3-Bag Task (Love et al., 2002, 2004), an observational measure

that was originally adapted from the NICHD SECCYD's Three-Box assessment of parent-child interactions (NICHD SECCYD, 1992). Mothers and children participated in a series of 10 minute, semi-structured play tasks in their home in which they were asked to interact with their children as they normally would, while playing with a series of toys in three separate bags. Interactions were video-recorded and later coded on a 7-point scale for *maternal sensitivity*, *stimulation of cognitive development*, and *positive regard* towards the child, with higher scores indicating greater frequency and intensity of behaviors (NICHD SECCYD, 1992). Video-recordings were coded by a trained, independent coding team at the Center for Children and Families at Columbia University, who were trained to reach an 85% minimum rate of agreement (Brady-Smith et al., 2000). *Sensitivity* included behaviors such as acknowledging the child's affect, altering the pace of play to meet the needs of the child and indicating developmentally appropriate expectations of child behavior. *Stimulation of cognitive development* included behaviors such as use of complex verbal language, efforts to scaffold the child's learning, and flexibility in instructions. *Positive regard* included behaviors such as praising, laughing, smiling, and showing affection towards the child. Internal consistency for all behaviors was high (Cronbach's $\alpha > .70$; Love et al., 2005) Inter-correlations among the three behaviors were high, thus scores were averaged to represent a composite score of maternal support, with higher scores representing more supportive behaviors (Fuligni & Brooks-Gunn, 2013; Love et al., 2002).

Teacher sensitivity. At the 14 month time point, trained observers assessed teachers' sensitive caregiving behaviors towards the children in their classroom with the Caregiver Interaction Scale (CIS; Arnett, 1989). Across a 2.5 hour observation, teachers

were rated from 1 (*item is not at all characteristic of this caregiver*) to 4 (*item is very much characteristic of this caregiver*) on 26 items that assessed the extent to which teachers displayed warmth (*positive* behaviors), were uninvolved and uninterested (*detached* behaviors), were hostile, threatening, or critical (*punitive* behaviors), and were lax towards children's misbehavior (*permissive* behaviors). To ensure reliability, observers were required to meet an 80% agreement rate with consensus scores during training, and were required to conduct within-site reliability practice visits with another observer at their child care center location (Love et al., 2004). This measure is widely used in child care research, with internal consistency generally reported as high across all behaviors (Cronbach's $\alpha > .70$; Colwell, Grodon, Fujimoto, Kaestner, & Korenman, 2013). Appropriate items were reverse scored such that all items indicated more favorable behaviors, and then all items were averaged such that higher scores reflect a higher degree of teacher sensitivity.

Covariates. In addition to the main variables of interest, several child and child care characteristics that have been associated with children's socioemotional outcomes in child care in previous studies were included as covariates in all analyses. In terms of child characteristics, *child sex* (male = 1, female = 0) and *child ethnicity* (Caucasian, African American, Hispanic or other, indicated by three dummy variables, with Caucasian as the reference group) were included, as some evidence suggests that high quality child care may have a stronger impact on certain groups, such as boys and African American children (e.g., Votruba-Drzal et al., 2010). Boys also tend to display poorer emotion regulation compared to girls (e.g., Matthews et al., 2009) and tend to experience poorer quality teacher-child interactions in infant/toddler child care (e.g., Ahnert et al.,

2006). To account for demographic risk factors, the original EHSRE research team computed an accumulative risk measure based on five dichotomous indicators at time of study enrollment: use of government assistance, adolescent childbearing (of the focal child), unemployment, maternal education less than high school, and single parent status (Love et al., 2002). Families were assigned a score of 1 in the presence of each risk factor. Scores were summed, creating an index of baseline family risk ranging from 0 (*no risk*) to 5 (*high risk*).

To account for potential differences in children's emotion regulation development due to participation in the EHS intervention, participation in the *EHS program group* (EHS = 1, control = 0) was included as a covariate. Additionally, to distinguish teacher sensitivity as a unique construct, total scores on the Infant/Toddler Environmental Rating Scale (ITERS; Harms et al., 1990) at 14 months were included to control for other aspects of overall *classroom quality*. Trained observers assessed multiple dimensions of quality: furnishings and display for children, personal care routines, listening and talking, learning activities, interaction and program structure (the items for adult needs were not included in this study; Love et al., 2004). Scores for 33 items were assigned along a 7-point scale with 1 described as *inadequate care*, 3 as *minimal care*, 5 as *good care*, and 7 as *excellent care*. Scores were averaged, with higher scores reflecting better classroom quality. The ITERS shows consistent positive associations with children's socioemotional wellbeing (Halle et al., 2011). Finally, *child-teacher ratio* at 14 months was included as a covariate. Ratio is an important structural component of quality that is commonly accounted for in research on the effects of child care on child development (Love et al., 2004; McCartney, Burchinal, Clarke-Stewart, Bub, Owen, Belsky, &

NICHD ECCRN, 2010). In the EHSRE data, child-teacher ratios were determined by counting the number of children and caregivers in the classroom up to 6 times across a 2-hour observation period. Averages were calculated to reflect the average number of children per teacher in the focal child's classroom (Love et al., 2004).

Analytic plan. Analyses were conducted with latent growth curve models in MPlus 7.0 (Muthén & Muthén, 1998-2012). Latent growth curve models estimate mean initial status (intercept), mean rate of change (slope), individual variability in initial status (intercept variance) and individual variability in rate of change (slope variance) in a structural equation model (SEM) framework (Bollen & Curran, 2006). Observed scores of emotion regulation at 14, 24, and 36 month time points were used to estimate latent intercept and slope growth factors and their variances (Figure 1). All factor loadings on the intercept growth factor were fixed to 1. To define linear growth, the factor loadings for the slope growth factor were fixed to 0 at 14 months (defining the intercept), 1 at 24 months, and 2.2 at 36 months. Residual variances were estimated and allowed to be different across time, and the intercept and slope growth factors were allowed to covary. As expected with any longitudinal study, missing data were present. Emotion regulation missingness was 6% (14 months), 18% (24 months), and 25% (36 months). Missingness on all other variables was minimal (< 10%) or zero. Children with missing data on emotion regulation at 36 months tended to have more demographic risk factors $t(362) = -2.25$, $p < .05$), lower teacher sensitivity $t(130.15) = 3.17$, $p < .01$) and higher emotion regulation at 14 months $t(341) = -2.14$, $p < .01$). All children were included in analyses by using full information maximum likelihood estimation (FIML; Muthén & Muthén, 1998-2012). FIML assumes data are missing at random (MAR), meaning that

missingness may be dependent on other variables in the data set (Schlomer et al., 2010). FIML accounts for missing data by estimating parameters based on available data and implied values of missing data given the associations between variables in the available data (Schlomer et al., 2010).

An unconditional latent growth model was estimated to determine if emotion regulation development should be represented as linear change across time with individual variation in intercept and slope. Next, a series of conditional models were estimated to determine if the time-invariant variables were predictive of individual variation in intercept and slope (Figure 1). All continuous predictor variables were mean centered to aid in interpretation of interactions. In these models, the intercept and slope growth factors were regressed on to all covariates (EHS program, child sex, ethnicity, family risk, classroom quality, child-teacher ratio), hypothesized predictors (maternal sensitivity, teacher sensitivity, negative emotionality), and interaction terms. The interaction terms (i.e., multiplicative products of the relevant variables) included three two-way interactions (maternal sensitivity x teacher sensitivity, maternal sensitivity x infant negative emotionality, teacher sensitivity x infant negative emotionality) and a three-way interaction (of maternal sensitivity x teacher sensitivity x infant negative emotionality). To confirm if the interactions were more meaningful as predictors of initial emotion regulation at 14 months or change in emotion regulation over time, I compared models in which the predictive paths of the interactions to the intercept were constrained to zero and a model in which the paths to the slope were constrained to zero, to a model in which all paths were freely estimated. Multiple fit indices were used to determine overall model fit (Kline, 2011): the statistical fit index, χ^2 for which a non-

significant χ^2 value (at a given *df*) indicates general model fit, the absolute fit index, root mean square error of approximation (RMSEA), for which values below .05 indicate excellent model fit and values of .06 to .09 indicate adequate model fit, and the relative fit indices (CFI) and Tucker Lewis index (TLI) in which values above .95 indicate excellent model fit and values of .90 to .95 indicate acceptable model fit. Two comparative fit indices, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) indices were also used to compare non-nested models, with lower scores indicating better model fit (Kline, 2011).

Statistically significant interactions were decomposed using similar techniques for decomposing interaction effects in multiple regression (Preacher, Curran, & Bauer, 2006). In latent growth models, although time is not an explicit variable in the model, time interacts with other exogenous predictors through a factor loading matrix to predict repeated measures of the dependent variable (for a full description, see Curran, Bauer, & Willoughby, 2004). As such, the two-way interactions are conceptualized as three-way interactions with time, and the three-way interaction is conceptualized as a four-way interaction with time (Curran et al., 2004). Using the online computational tool by Preacher et al. (2006), the simple trajectories of emotion regulation at different high/low (+/- 1*SD*) combinations of the interaction variables were plotted to explore the nature of the interactions.

Results

All variables were screened prior to analyses. Teacher sensitivity was negatively skewed, thus a log10 transformation was applied to achieve a normal distribution. Bivariate correlations and descriptive statistics of the available data (see Table 1)

indicated that observations of emotion regulation were positively correlated at each time point, with mean scores increasing across time as well. Children with higher negative emotionality scores were rated as having poorer emotion regulation at 14 and 24 months. Higher negative emotionality was negatively associated with concurrent maternal support, but was unrelated to teacher sensitivity. Maternal sensitivity at 14 months was associated with increased emotion regulation at all time points, whereas teacher sensitivity at 14 months was unrelated to emotion regulation.

Unconditional latent growth model. The unconditional latent growth model estimated mean intercept, mean slope, and variance parameters as linear change across time (Figure 1). Results of the unconditional model provided adequate to mediocre fit (χ^2 = 4.01, *df* = 1, *p* = .05; RMSEA = .09, CFI = .94, TLI = .83, BIC = 2027, AIC = 1995). For comparison, a model in which all slope growth factor parameters were constrained to zero was also estimated to ensure that linear growth was preferred to no growth. Model fit significantly worsened ($\Delta \chi^2$ = 36.67, Δ *df* = 3, *p* < .001, RMSEA = .16, CFI = .31, TLI = .49, BIC = 2046, AIC = 2026), indicating that linear growth was preferred.

Results of the unconditional model (Table 2) indicated that mean emotion regulation at 14 months was 3.68 (*p* < .001), and that the average rate of emotion regulation growth per time point was .12 (*p* < .001). Infants varied significantly in emotion regulation at 14 months as well as in rate of change over time. Intercepts and slopes were significantly inversely correlated (*r* = -.36, *p* < .05), such that infants with lower initial emotion regulation showed faster rates of growth, and infants with higher initial emotion regulation showed slower rates of growth. Residual variance estimates

indicated significant within-individual variation in emotion regulation that was unexplained by time.

Conditional latent growth model. The conditional latent growth models determined if maternal support, teacher sensitivity, negative emotionality, and the maternal support x teacher sensitivity x negative emotionality three-way interaction (and associated two-way interactions) were associated with individual variance in emotion regulation intercept and slope. The first model freely estimated all regression path coefficients from all independent variables to the intercept and slope growth factors. The model fit the data well (χ^2 = 21.71, *df* = 16, *p* = .15; RMSEA = .03, CFI = .96, TLI = .87, BIC = 8689, AIC = 8023). Path coefficients indicated that the three-way interaction was a significant predictor of slope (β = -.20, *p* < .05) but not intercept (β = -.03, *p* = .78). To confirm this finding, I estimated a second slope-only model in which the interaction coefficient paths to the intercepts were constrained to zero, while the paths to the slope continued to be estimated freely. This model led to improved fit (χ^2 = 22.58, *df* = 30, *p* = .31; RMSEA = .02, CFI = .98, TLI = .95, BIC = 8675, AIC = 8016). In comparison, an intercept-only model with interaction coefficient paths to the slope constrained to zero while coefficient paths to the intercept were freely estimated, improved model fit on a few indices (χ^2 = 26.70, *df* = 20, *p* = .14; RMSEA = .03, CFI = .95, TLI = .85, BIC = 8679, AIC = 8020). Comparing the slope- and intercept-only models, the slope-only model had the best overall model fit on all indices, including the lowest BIC and AIC, thus the slope-only model was retained as the final model.

Regression path coefficients for the predictor variables to the intercept and slope growth factors for the final model are presented in Table 3. Males were significantly

more likely to have lower initial emotion regulation than females. In comparison to Caucasian children, Hispanic children started with significantly higher initial emotion regulation and then showed slower change over time. Increased family risk was marginally associated (p = .06) with slower change over time. Children in child care classrooms at 14 months with higher child-teacher ratios showed significantly slower change over time, whereas classroom quality at 14 months was marginally inversely associated (p = .07) with change in emotion regulation. In terms of the hypothesized predictors, maternal support at 14 months was significantly positively associated with initial emotion regulation. High negative emotionality was significantly inversely associated with initial emotion regulation and marginally positively associated with (p = .07) with faster change over time. Teacher sensitivity at 14 months was unrelated to initial emotion regulation and slope.

The two-way interactions were not significant predictors of initial emotion regulation or slope. The three-way interaction of maternal support x teacher sensitivity x negative emotionality was a statistically significant predictor of emotion regulation slope. To explore the nature of the interaction, the simple slopes of trajectories of emotion regulation were plotted in different high/low (+/- 1*SD*) combinations of maternal support and teacher sensitivity, displaying variation in the simple trajectories by high/low (+/- 1*SD*) levels of negative emotionality (Figure 2). Children who experienced low caregiving quality both at home and child care at 14 months (Figure 2a) showed no significant change in emotion regulation across time; the slopes for children with high negative emotionality (b = .01, p = .94) and low negative emotionality (b = .06, p = .54) were not different from zero. In comparison, children who experienced high caregiving

quality in both contexts (Figure 2d) showed higher initial emotion regulation and significant growth across time, with children with high negative emotionality showing, on average, a slightly steeper slope ($b = .35$, $p < .05$) than children with low negative emotionality ($b = .33$, $p < .001$).

Cross-over interaction effects were found when children experienced high caregiving quality in one context and low caregiving quality in the other. In these instances, children with high negative emotionality began with the lowest initial ER, but surpassed children with low negative emotionality by 36 months. Children who experienced low maternal support and high teacher sensitivity (Figure 2c) showed significant gains in emotion regulation over time, with children with high negative emotion scores showing faster rates of growth ($b = .66$, $p < .001$) than children with low negative emotion scores ($b = .41$, $p < .001$). Similarly, children who experienced high maternal support and low teacher sensitivity (Figure 2b) showed significant gains over time, with children with high negative emotion scores showing faster rates of growth ($b = .47$, $p < .01$) than children with low negative emotion scores ($b = .29$, $p < .01$).

Discussion

Drawing on bioecological theory (Bronfenbrenner & Morris, 2006) and the differential susceptibility hypothesis (Belsky & Pluess, 2009), the aim of the present study was to examine the direct and interactive influences of home and child care center caregiving contexts on the development of emotion regulation for EHS-participating and EHS-eligible children in center-based child care, specifically considering individual variation in these processes that may be due to temperamental reactivity in infancy. In a latent growth curve framework, I examined teacher sensitivity in center-based child care

and maternal support at home as predictors of concurrent emotion regulation and growth over time, anticipating that higher quality care in each context would be uniquely associated with higher initial and steeper increases in emotion regulation. Including a series of two-way interaction terms in the model, I also anticipated that teacher sensitivity would operate as a protective factor when maternal support was low at home, and that children with high negative emotionality would show the best (and worst) outcomes depending on caregiving quality. Finally, with the inclusion of a three-way interaction term, I anticipated that children with high negative emotionality would be the most sensitive to the combined highest (and lowest) caregiving quality across contexts, including being more susceptible to the protective influence of teacher sensitivity on the development of emotion regulation than children with low negative emotionality.

Overall, support for hypotheses was mixed. In general, this sample of children showed positive growth in emotion regulation across 14 to 36 months, with significant individual variation in initial emotion regulation and in growth over time. After accounting for the covariates, the variables maternal support, and infant negative emotionality helped explain initial individual variation in emotion regulation, with high maternal support and low negative emotionality associated with increased scores concerrently. However, these variables were unrelated to the development of emotion regulation across time (although negative emotionality was trending towards significance). Teacher sensitivity was unrelated to emotion regulation concurrently and across time, and did not operate as a general protective factor in the development of emotion regulation for all children (regardless of negative emotionality) when maternal support was low at home.

Caregiving quality across contexts. The role of teacher sensitivity in the development of emotion regulation was best understood in combination with both maternal support and infant negative emotionality, as represented by the significant three-way interaction between these variables. Numerous conclusions can be drawn from this complex interaction. As depicted in Figures 2a and 2c, the protective nature of teacher sensitivity in child care, and variation due to infant negative emotionality, was more apparent within the context of low maternal support than high maternal support, which, given the powerful nature of high quality maternal behaviors on socioemotional wellbeing (Bocknek et al., 2009; Calkins et al., 1998; Calkins & Hill, 2006; Cole et al., 2004; Grolnick & Faraks, 2002), is to be expected. Ultimately, the proximal processes in the mother-child relationship are more intense and frequent than teacher-child interactions in child care. In addition, the quality of maternal behaviors is relatively stable across time (e.g., Stright, Gallagher, & Kelley, 2008), whereas teacher quality is more variable, especially if children change teachers or classrooms each school year. These results confirm high quality maternal caregiving as a powerful context for the development of emotion regulation.

As expected, children with poor caregiving quality at both home and in child care fared the worst (Figure 2a). All children in these conditions (regardless of negative emotionality) displayed emotion regulation slopes that were indistinguishable from zero. These results are not surprising, given the deleterious effect of low quality caregiving on children's socioemotional development (Grolnick & Faraks, 2002), with risk for these children compounded even further by experiencing poor quality caregiving in multiple contexts (e.g., Hartz & Williford, 2014; Watamura et al., 2011). Alternatively, within the

context of low maternal support specifically, high teacher sensitivity was associated with significant gains in emotion regulation (Figure 2c). In other words, for children experiencing poor maternal support at home, teacher sensitivity in child care served as a protective factor the development of emotion regulation. This buffering effect was seen for all children experiencing low maternal support (regardless of negative emotionality) highlighting the lasting importance of caregiver sensitivity in infant/toddler child care for children facing risk at home. Given these results, teacher sensitivity in center-based care can be conceptualized as a proximal process that supports the development of emotion regulation by creating a caregiving context that acts as a source of support for the behavioral and cognitive capacities young children need to learn to manage internal regulatory control effectively (Cole et al., 2004; Grolnick & Farkas, 2002). In the present study, these processes were seen only within the context of low maternal support (as evidenced by the insignificant maternal support x teacher sensitivity interaction), further highlighting the importance of examining interactive processes within child care research to understand the truly reciprocal nature of proximal processes across contexts. In this sample, the role of teacher sensitivity in the development of emotion regulation might have easily been dismissed without considering under which conditions teacher sensitivity has the most impact.

Differential susceptibility to caregiving experiences. In terms of differential susceptibility to caregiving experiences, findings point to the complex, interactive nature of child and caregiver processes that shape early development. Importantly, I did not find support for the hypotheses that infant negative emotionality would moderate the effect of mother and teacher caregiving quality separately on the development of emotion

regulation. This was surprising, as the magnified impact of caregiving quality at home and in child care for children with high negative emotionality is well documented in the literature (e.g., Kim & Kochanska, 2012; Pluess & Belsky, 2009, 2010). In the present sample, understanding *for whom* variation in caregiver sensitivity was most important was best understood when mothers and teachers were considered together. Results of the three-way interaction were not strong enough to satisfy the exact conditions of differential susceptibility (in which children with high negative emotionality should fare the best in the best conditions and the worst in the worst conditions; Belsky & Pluess, 2009): children with high negative emotionality did show the lowest gains in emotion regulation when caregiving quality was low in both contexts (the worst condition; Figure 2a), but did not show the highest gains when caregiving quality in both contexts was high (the best condition; Figure 2d). As a consideration, however, the emotion regulation slope for the children with high negative emotionality was slightly steeper than children with low negative emotionality, implying that children with high negative emotionality would ultimately show the highest gains in emotion regulation in the future.

Despite this initial finding, I did find evidence to support the hypothesis that children with high negative emotionality would be more susceptible to the protective effect of teacher sensitivity when maternal support was low (Figure 2c). In this case, children with high negative emotionality surpassed children with low negative emotionality in emotion regulation development over time. While there was not clear evidence of differential susceptibility across the entire sample, these results highlight the importance of conceptualizing certain children as *more susceptible to the interaction* between multiple caregiving contexts. From this perspective, children who display high

negative emotionality may be more susceptible to the compensatory effect of high quality teachers in child care. That is, when maternal caregiving quality is minimal, the underlying biological mechanisms that are manifested as negative emotionality may predispose these children to reap maximum benefit from additional caregiver sensitivity in child care. Future research should test for three-way interactions between parental, teacher, and child characteristics to help determine the nuances of these processes. In their recent call to action, Phillips and colleagues (2011) stress that child care research must move past direct effects and focus on individual differences to experiences in child care. Given that many early child care and education programs are designed to bolster the outcomes of children facing risk at home, differential susceptibility to the protective role of teacher sensitivity is important to consider as well.

Limitations and future directions. There are a few important limitations of the present study that provide insight into possible next steps in this line of research. First, maternal support was quantified based on observed, semi-structured play tasks in which mothers and children engaged in dyadic interactions, whereas teacher sensitivity was quantified based on teacher interactions with various children in the classroom. In this case, the CIS (Arnett, 1989) is a global assessment of teacher sensitivity in the classroom. Global measures of classroom quality may not be reflective of, or actually misrepresent, individual children's experiences (e.g., Jeon et al., 2010). Moreover, recent evidence on the psychometric properties of the CIS found that the assessment tends to skew negatively, meaning that positive teacher behaviors are overly represented, limiting the measure's ability to distinguish between mean and high teacher sensitivity (Colwell et al., 2013). Thus, while present analyses highlight the importance of the global construct of

teacher sensitivity, our understanding of the exact nuances of the protective role of teacher sensitivity in child care and differential susceptibility to these experiences may be enhanced with measures that capture proximal processes of individual teacher-child dyads within infant/toddler child care (Mortensen & Barnett, 2015). This may be especially relevant for understanding the development of emotion regulation, a domain that is conceptualized as heavily intertwined with synchronous caregiver-child interactions.

The present analyses examined teacher sensitivity and maternal support at the initial emotion regulation time point only. Future research should include teacher and maternal caregiving quality as time-varying predictors to help establish temporal precedence among caregiver behaviors and emotion regulation. This would also allow for the examination of *change* in caregiver quality as a specific predictor of emotion regulation development. In terms of child care teachers, this brings up the added issue of continuity of care, as most children experience a different teacher (and potentially different caregiving quality) as they transition from one classroom to the next. Additionally, the additive effect of teacher sensitivity for children who are in child care for multiple years is another possibility to consider. Further, although a strength of this study was the use of data from multiple sources, including observations of mothers and teachers behaviors and children's emotion regulation, the measure of negative emotionality was mother-reported, and thus subject to maternal biases. Future research should include direct, objective assessments of children's temperamental characteristics.

Finally, sample size may have contributed to the inability to detect clear evidence of differential susceptibility across the three-way interaction. Parsing the sample in to

high and low combinations across three variables is limiting in terms of the number of participants it represents, thus a stronger effect of negative emotionality may be seen in a larger sample with more participants that represent the various high/low combinations of caregiving quality. Future research should replicate these analyses with larger samples with more statistical power.

Implications and Conclusions

Teachers in center-based infant/toddler child care play an important role in the lives of the families and children in their classrooms. Teacher-child interactions are one of the most salient aspects of child care quality for young children's development (Phillips & Lowenstein, 2011), thus it is imperative that research elucidates the role these caregivers play in facilitating young children's regulatory processes. Quality child care is essential for all children, but in order to maximize early care and education intervention efforts, it is vital to understand under which conditions teachers act as developmental assets for children facing the most risk. Furthermore, understanding these processes in a center-based context is important because regulated centers are positioned to provide systematic training to their employees, helping teachers serve as professional support for children and families. The present study highlights the importance of training teachers to create sensitive caregiving environments. Children with high negative emotions who experience unsupportive parenting at home may pose added caregiving challenges in the classroom, thus teachers must be well-equipped to provide the types of sensitive caregiving experiences that facilitate emotion regulation for a range of temperamental reactivity, given that these children may stand to gain the most from an additional sensitive caregiving context.

Table 1

Bivariate correlations and descriptive statistics of study variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. 1=EHS program[a]	--													
2. 1=Child is male[b]	.03	--												
3. 1=African American[c]	.14**	.02	--											
4. 1=Hispanic[c]	.06	.00	-.03	--										
5. 1=Other ethnicity[c]	.01	.03	.32***	.40***	--									
6. Family risk	.10	-.04	.08	-.01	-.01	--								
7. Negative emotionality 14mo	.12*	.04	.13**	-.05	-.03	.17***	--							
8. Maternal support 14mo	-.12*	-.08	-.29***	.02	-.01	-.20***	-.19***	--						
9. Teacher sensitivity 14mo	.31***	-.05	.01	-.06	-.03	-.01	.01	-.06	--					
10. Classroom quality 14mo	.31***	-.02	.01	.03	-.01	-.03	.01	-.04	.72***	--				
11. Child-teacher ratio 14mo	-.34***	.03	-.02	-.06	.00	-.07	.04	.03	-.42***	-.47***	--			
12. Emotion regulation 14mo	.00	-.19***	-.06	.17**	.08	-.01	-.13*	.20***	-.04	-.03	.04	--		
13. Emotion regulation 24mo	-.01	-.18**	-.08	.05	-.06	-.09	-.14**	.33***	.07	.05	-.09	.24***	--	
14. Emotion regulation 36mo	-.01	-.24***	.03	-.00	.03	-.09	-.03	.21***	.08	.02	-.08	.14*	.38***	--
M						2.46	2.89	4.04	3.32	4.48	3.14	3.69	3.72	3.96
SD						1.15	.96	1.04	.45	1.24	1.43	.66	.78	.79

Notes. [a] 0 = Control, [b] 0 = child is female, [c] 0 = reference group is Caucasian

*$p < .05$, **$p < .01$, ***$p < .001$

Table 2

Model parameters for unconditional latent growth curve model of emotion regulation

	Estimate	*SE*
Mean		
Intercept	3.68***	.04
Slope	.12***	.10
Variance		
Intercept	.17**	.05
Slope	.12**	.03
Covariance		
Intercept with Slope	-.05	.03
Residual Variances		
Emotion regulation 14mo	.27***	.06
Emotion regulation 24mo	.43***	.04
Emotion regulation 36mo	.19*	.08

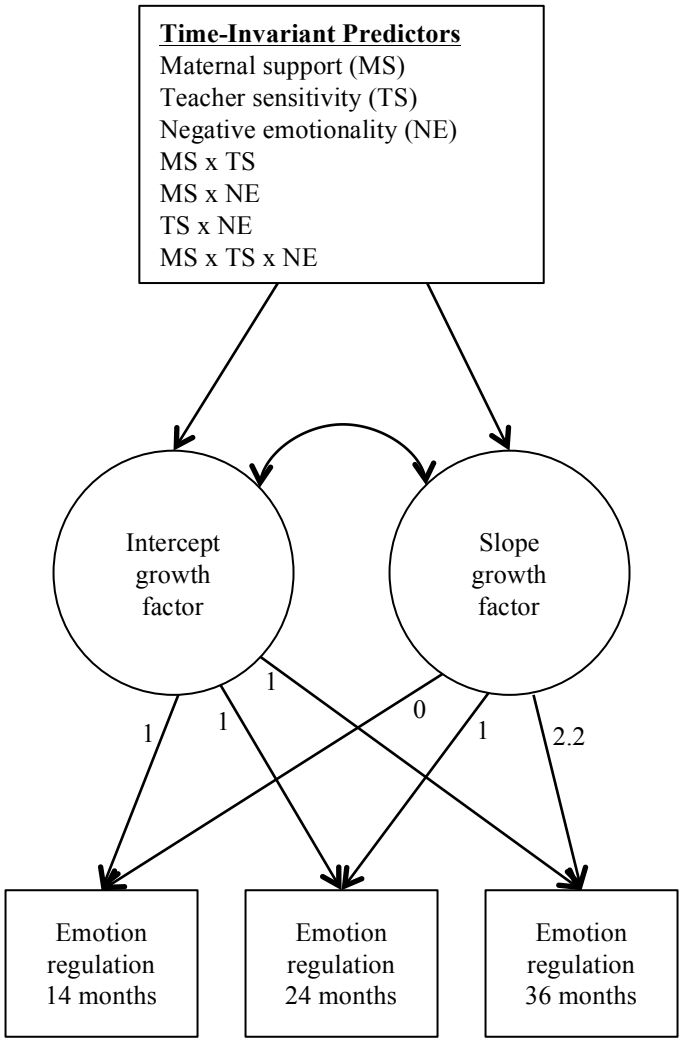
Notes. Parameters are unstandardized estimates. *$p < .05$, **$p < .01$, ***$p < .001$

Table 3

Beta coefficients for pathways from time-invariant predictors to intercept and slope growth factors for final model.

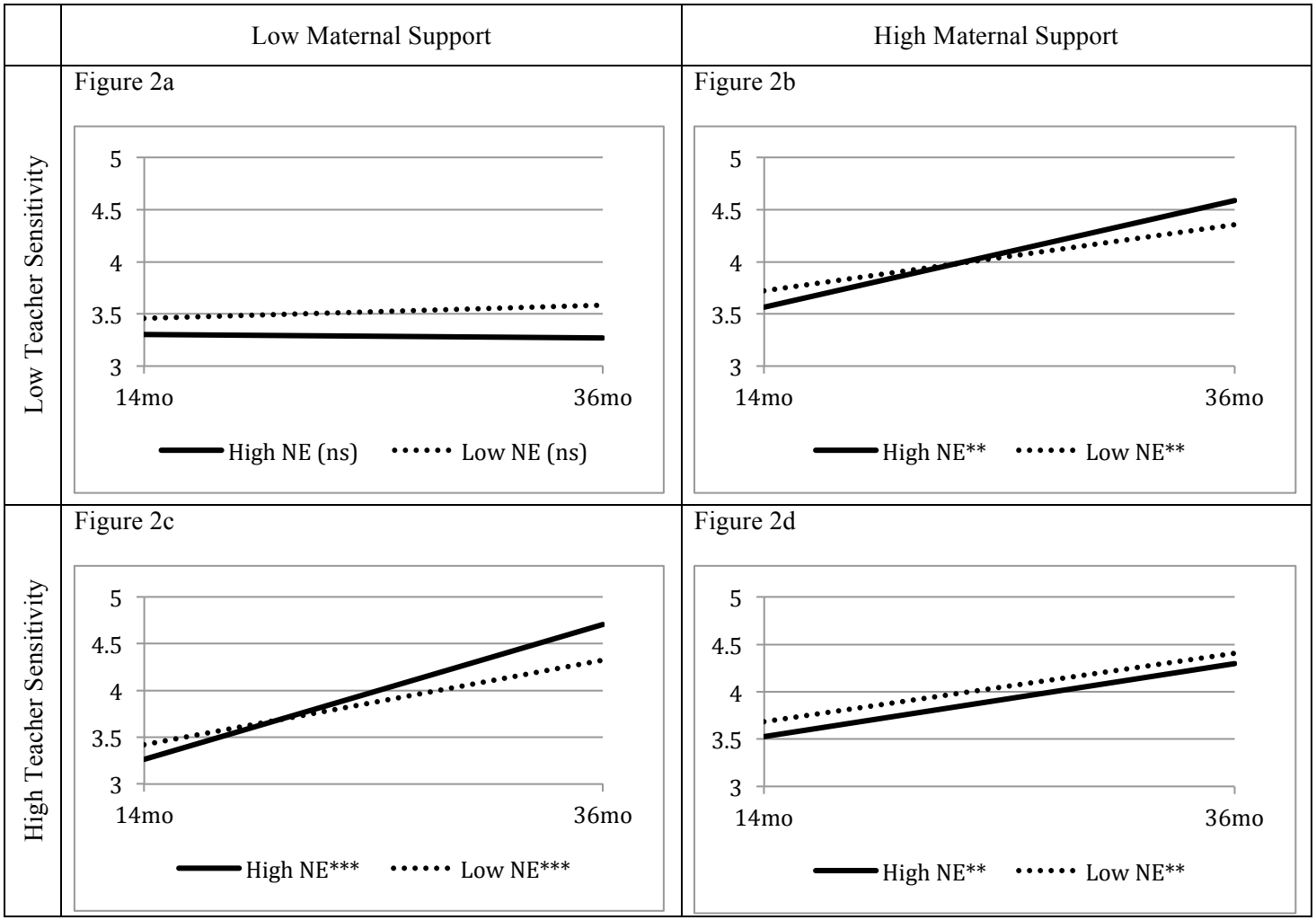
Variable	Intercept			Slope		
	B	*SE*	*β*	*B*	*SE*	*β*
1=EHS program[a]	.10	.08	.11	-.08	.06	-.11
1=Child is male[b]	-.23	.07	-.30***	-.05	.05	-.08
1=African American[c]	-.01	.07	-.02	.04	.05	.08
1=Hispanic[c]	.22	.07	.27**	-.15	.06	-.24*
1=Other ethnicity[c]	.02	.12	.02	-.09	.10	-.10
Family risk	.02	.03	.05	-.04	.02	-.16†
Classroom quality	.01	.04	.03	-.06	.03	-.24†
Child-teacher ratio	.03	.03	.12	-.10	.02	-.26*
Negative emotionality (NE)	-.08	.04	-.20*	.05	.03	.16†
Maternal support (MS)	.13	.04	.33**	.03	.03	.10
Teacher sensitivity (TS)	-.18	.46	-.05	.55	.37	.20
MS x TS	.00	.00	.00	.36	.24	.12
MS x NE	.00	.00	.00	.00	.02	.02
TS x NE	.00	.00	.00	.20	.20	.08
MS x TS x NE	.00	.00	.00	-.55	.21	-.23**

Notes. [a] 0 = Control, [b] 0 = child is female, [c] 0 = reference group is Caucasian; all continuous variables mean-centered; interaction coefficient paths to the intercept were constrained to zero, while coefficient paths to the intercept were freely estimated.
† $p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$



Notes. All time-invariant predictors measured at 14 months. EHS program, child sex, ethnicity, family risk, classroom quality, and child-teacher ratio included as covariates.

Figure 1
Conceptual latent growth curve model



Notes. *$p < .05$, **$p < .01$, ***$p < .001$

Figure 2

Three-way interaction results of maternal support x teacher sensitivity x negative emotionality predicting change in emotion regulation over time.

CHAPTER IV: THE ROLE OF CHILD CARE IN SUPPORTING THE EMOTION REGULATORY NEEDS OF MALTREATED INFANTS AND TODDLERS

The maltreatment of young children by their parents represents the ultimate failure of the environment to provide children with the caregiving experiences necessary to promote healthy emotional development (Cicchetti, Toth, & Maughan, 2000). Maltreatment at any age can have a lasting impact on emotional wellbeing, however, the deleterious effect of abusive and neglectful parenting behaviors experienced during infancy and toddlerhood are particularly strong. Children who are victimized under the age of 5 show increased emotion dysregulation, externalizing and internalizing problems, increased anxiety and depression symptomology, and increased rates of academic failure as compared to children who are victimized in childhood (Fantuzzo, Perlman, & Dobbins, 2011; Kaplow & Widom, 2007; Keiley, Howe, Dodge, Bates & Pettit, 2001; Kim & Cicchetti, 2010). Unfortunately, infants and toddlers are at higher risk for maltreatment than any other age group (U.S. Department of Health and Human Services [DHHS], 2015). The estimated rate of victimization for children younger than 12 months is 23.1 per 1000, and approximately 11 per 1000 for toddlers ages 1 to 3 (U.S. DHHS, 2015). To address the needs of victimized infants and toddlers, it is important to consider other caregiving relationships and settings that may provide support for the unique emotion regulatory difficulties these children may experience.

Recent prevention and treatment efforts have focused on center-based child care as one important setting for supporting the needs of maltreated children (e.g., Dinehart, Katz et al., 2012). Center-based child care is an existing delivery system of services for

many families, representing an "opportune point of entry" for providing support to this population (Daro & Dodge, 2009; Osofsky & Leiberman, 2011). Nationally, approximately 34% of infants and toddlers with employed mothers participate in formal child care programs (U.S. Census Bureau, 2013). Data from the National Survey of Child and Adolescent Wellbeing (NSCAW) estimates that for infants and toddlers involved in the child welfare system (i.e., any level of investigation by child protective services), 26% of those living in their biological home, 30% of those in out-of-home placements, and 26% of those in foster care participate in center-based child care (Ward, Young Yoon, Atkins, Morris, Oldham & Wathen, 2009). Under the federal Child Care and Development Block Grant, which provides funding to states for increasing access to child care services for low income families, the majority of states offer child care subsides to families investigated by child protective services and foster care families, often with less strict eligibility requirements (Minton, Durham, & Giannarelli 2011), ensuring that an element of caregiving stability remains in these children's lives (Meloy & Phillips, 2012a). Early care and education programs such as Early Head Start (EHS), also give priority enrollment to children living in foster care, regardless of other eligibility requirements (U.S. DHHS, 1992). Such policies aim to increase victimized children's access to child care and the stable caregiving environment it offers; however, lack of integration across child care and child welfare systems inhibits effective service delivery (Osofsky & Leiberman, 2011). Publically-funded child care and child welfare systems stem from different funding streams, leaving the systems siloed, and many high risk children in need of access to publically-funded child care programs fail to receive those services. This is unfortunate considering that the developmental goals of child care

programs are more in line with the needs of maltreated infants and toddlers than some social services funded through child welfare systems (for a full review, see Meloy & Phillips, 2012b).

To better understand the potential impact of child care on victimized children, researchers have begun to empirically examine links between child care and developmental outcomes of children in child welfare (i.e., any level of investigation by child protective services), as well as children in non-parental or foster care arrangements (e.g., Dinehart, Katz et al., 2012; Dinehart, Manfra, Katz, & Hartman, 2012; Kovan, Mishra, Susman-Stillman, Piescher, & Laliberte, 2014; Lipscomb, Pratt, Schmitt, Pears, & Kim, 2013; Lipscomb, Schmitt, Pratt, Acock, & Pears, 2014; Meloy & Phillips, 2012b). Given the plethora of evidence that supports quality child care as significant in promoting the socioemotional wellbeing of infants and toddlers in the general population (Burchinal et al., 2008; Love et al., 2003; Love et al., 2005; Peisner-Feinberg et al., 2001; Phillips & Lowenstein, 2011; Vandell et al., 2010; Vogel et al., 2010), with especially strong effects seen for those facing higher socioeconomic, demographic, and temperamental risk (Pluess & Belsky, 2009; Votruba-Drzal et al., 2010; Watamura et al., 2011), it stands to reason that quality child care is positioned to serve as a developmental asset for maltreated children. The majority of the extant research on connections between maltreatment and child care has focused on the socioemotional development of preschool-age children (e.g., Kovan et al., 2014; Lipscomb et al., 2013; Lipscomb et al., 2014). Given the unique emotion regulatory needs of infants and toddlers, and the exacerbated effects of maltreatment for this age group, it is important to examine the role child care may play in the emotional development of the youngest children.

Additionally, a large body of research supports teacher caregiving quality as the critical mechanism that facilitates emotional development in child care (for a full review see Mortensen & Barnett, 2015), thus it is also important to focus on associations between teacher caregiving quality and victimized infants' and toddlers' emotional wellbeing, as well as how the caregiving needs of maltreated infants and toddlers may differ from the general population (e.g., Lipscomb et al., 2014).

The Present Review

To address these issues, the present review presents a framework for conceptualizing teacher caregiving quality within center-based child care as a developmental asset for the unique emotion regulatory needs of maltreated infants and toddlers. Guided by ecological theory (e.g., Bronfenbrenner & Morris, 2006; Cicchetti et al., 2000), this review focuses on how maltreatment undermines the emotion regulatory capabilities of infants and toddles and the mechanisms by which teacher caregiving quality may play a buffering role. This review also examines how child care centers can create more effective caregiving environments for maltreated infants and toddlers with more specific teacher training, a trauma-informed perspective of care, and creation of a community of caregiving support for parents. This review also addresses new directions for research that will further elucidate the developmental processes facilitating the emotional wellbeing of maltreated infants and toddlers in child care.

The Scope of Infant/Toddler Maltreatment

Legal definitions of maltreatment vary by state, but the federal Child Abuse Prevention and Treatment Act (CAPTA), as amended by the CAPTA Reauthorization Act of 2010, defines maltreatment at a minimum as, "any recent act or failure to act on

the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent risk of serious harm," including neglect, physical abuse, psychological maltreatment, and sexual abuse (U.S. DHHS, 2010). Annual data from the National Child Abuse and Neglect Data System (NCANDS), which collects state-level data on all children investigated by child protective services, suggests that infants and toddlers fare much worse than older children (U.S. DHHS, 2015). In 2013, children under age 3 had the highest rates of victimization, over a quarter of maltreatment victims were younger than 3, and approximately 21% percent of children living in foster care arrangements were under the age of 3 (U.S. DHHS, 2014; 2015). Other alarming trends indicate that infants and toddlers experience the highest rates of recurrent maltreatment, and due to their physical size and high dependence on caregivers, suffer the highest rates of serious injury and abuse-related fatalities (Klein & Jones Harden, 2011). In 2013, 73.9% of all maltreatment related fatalities were children under age 3 (U.S. DHHS, 2015). Maltreatment is assumed to be vastly underreported (Sedlak & Ellis, 2014), thus the actual population of maltreated infants and toddlers is likely much larger than what is represented in official statistics. Research samples of victimized children are typically comprised of children involved in child welfare (i.e., any level of investigation by child protective services), or children who have been removed from their biological homes and placed in non-parental or foster care.

A variety of parent, child, family, and contextual risk factors are associated with maltreatment; however, these variables are often interrelated, making it difficult to infer causality. Smoking during pregnancy, having multiple children in the home, young

maternal age (< 20 years), unmarried marital status, low birth weight, and positive toxicology at birth are all risk factors for infant maltreatment (Williams, Phillips, Morrissey, McCartney, & Bub, 2011; Wu, Ma, Carter, Ariet, Feaver, Resnick et al., 2004; Zhou, Hallisey, & Freymann, 2006). Parental anger/hyperactivity and family conflict are strong predictors of physical abuse, and factors such as poor parent-child relationships, parental stress, parental self-esteem, and parental anger/hyperactivity are strong predictors of neglect (Stith, Liu, Davies, Boykin, Alder, Harris et al., 2009). Parental cognitive appraisal of challenging caregiving experiences stemming from infant characteristics (e.g., low Apgar scores, low birth weight, or prolonged crying) is also a risk for maltreatment (Bugental & Happaney, 2004; Rijneveld, Van der Wal, Brugman, & Sing, 2004), as is parental perception that the child is a problem (Stith et al., 2009). Maltreatment has high comorbidity with other stressful family issues such as domestic violence, parental drug or alcohol abuse, and economic hardship (U.S. DHHS, 2015; Slack, Berger, DuMont, Yang, Kim, Ehrhard-Dietzel et al., 2011; Williams et al., 2011; Wu et al., 2004; Zhou et al., 2006). Although associated, it is challenging to disentangle the direction of effect between socioeconomic disadvantage and maltreatment, as the risk factors associated with both are often interrelated (Drake & Jonson-Reid, 2014); importantly however, this means that many families at risk for maltreatment may also be eligible for or participating in existing public programs for socioeconomically disadvantaged families, including child care subsidies, EHS, or other early care and education programs.

Theoretical Framework

Ecological models of human development (e.g., Bronfenbrenner & Morris, 2006; Cicchetti et al., 2000) provide a theoretical foundation for understanding the role of multiple caregivers in the development of infant/toddler emotion regulation, the deleterious effect of maltreatment, and the potential buffering impact of teacher caregiving in child care. Ecological models position children at the center of a series of nested systems, conceptualizing development as driven via children's regular interactions (i.e., *proximal processes*) within each system (Bronfenbrenner & Morris, 2006). From this perspective, parent-child proximal processes within the home *microsystem* (i.e., a proximal setting the child has direct contact with) shape the development of emotion regulation, with sensitive-responsive and synchronous parent-infant interactions associated with increased regulatory capabilities in toddlerhood (Kim & Kochanska, 2012; Bocknek et al., 2009). Given this perspective, maltreatment represents the failure of the environment to provide children with the types of proximal processes necessary for healthy development (Cicchetti et al., 2000). Instead, the dysfunctional parent-child proximal processes involved in abusive and neglectful caregiving environments facilitate dysregulated patterns of emotional responses and regulation (Cummings et al., 1994; Kim-Spoon et al., 2013; Maughan & Cicchetti, 2002).

Ecological models also consider protective factors and buffers elsewhere in the environment that may offset some of the negative effects of maltreatment on developmental outcomes (Cicchetti et al., 2000). Teacher-child proximal processes within the child care microsystem can be conceptualized as another important driver of emotional development, and are often considered the most powerful component of child

care that affects change in children's outcomes (Hamre, 2014; Phillips & Lowenstein, 2011; Mortensen & Barnett, 2015). The quality of these interactions are critical, especially for infants and toddlers who may face "double jeopardy" if both home and child care caregiving environments are of low quality (e.g., Watamura et al., 2011). High quality child care, especially high quality teacher-child interactions, may have the potential to serve as a developmental asset for maltreated infants and toddlers. Furthermore, interactions between the family and child care microsystems (i.e., *mesosystem*) also impact children's wellbeing (McCartney, 2006). More distal forms of support for the emotionally wellbeing of these children are created through efforts to build communities of caregiving support for parents within child care centers (Daro & Dodge, 2009).

Guided by an ecological perspective, the remaining sections of this review examine infant/toddler emotion regulation as it develops within the context of the parental caregiving relationship, and the mechanisms by which the toxic proximal processes of maltreatment undermine this development. The role of child care, specifically teacher caregiving quality, is then considered as a potential developmental asset for these children, including suggestions for improving the quality of proximal processes in this setting, policies that promote collaboration between child welfare and child care systems, and new directions for research in this area.

Maltreatment and Emotion Regulation

Infant/toddler emotion regulation. Emotion regulation includes the processes and strategies used to manage the experience of emotional arousal and the behavioral expression of emotions to function effectively with others (Calkins, 1994; Eisenberg et

al., 2006). The regulatory skills acquired during infancy and toddlerhood facilitate the development of social competence, emotional understanding, peer relations, and empathy in early childhood (Blair et al., 2012; Calkins & Hill, 2006; Eisenberg et al., 2006; Liew, 2012), as well as contribute to effective engagement with teachers and peers in the classroom, contributing to social and academic success throughout elementary school (Liew, 2012; Ursache et al., 2012).

Although human infants are primed to engage in a variety of attachment behaviors that elicit support from caregivers (e.g., crying, looking), they have few cognitive, behavioral, or physical capacities to regulate their own emotional arousal, making them extremely dependent on external forms of regulation from caregivers (Sroufe, 1995). Thus, a major developmental task of infancy and toddlerhood is the transition from external forms of emotion regulation to more internalized control (Calkins & Hill, 2006). Toddlers can start to use their new cognitive, behavioral, and physical capabilities to develop strategies for managing their own emotions, such as self-soothing with the help of a special toy, or seeking physical proximity with a primary attachment figure. Parents play a critical role in helping infants and toddlers internalize regulatory control by responding to their physical and emotional needs with consistent, sensitive behaviors, and scaffolding developmentally appropriate emotional responses and behaviors as children get older (Calkins, 1994; Calkins & Hill, 2006).

Emotional sequelae of maltreatment. Developmental processes by which young children transition from external to internal forms of emotion regulation are subject to great individual variation depending on the quality of the caregiving environment (Calkins & Hill, 2006; Cicchetti & Toth, 2005). Maltreatment of infants

and toddlers has a deleterious effect on the development of the cognitive and behavioral strategies used to regulate emotions in part because of the dysfunctional parent-child interactions occurring in abusive and/or neglectful situations. Given the nature of proximal processes, emotion regulation is the product of the reciprocal interactions between children's own developing regulatory capacities and parents' caregiving behaviors (Calkins, 1994). From this perspective, maltreatment creates toxic relational exchanges and fails to support healthy development (Cicchetti et al., 2000), with the effects of maltreatment symptomatic of dysfunctional parent-child interactions and extending beyond the physical consequences of abuse and neglect (Luke & Banerjee, 2013; Wolfe, 1987). Chaotic, unpredictable, and/or unresponsive environments that are characteristic of maltreating homes further exacerbate the direct physical and emotional harm of maltreatment, culminating in toxic levels of stress (e.g., Shonkoff, Garner, Seigel, Dobbins, Earls et al., 2012). With no sensitive-responsive caregiver to mitigate this stress, maltreated infants and toddlers are left exposed to overwhelming emotional arousal, which risks damaging developing physiological and psychological processes (National Scientific Council on the Developing Child, 2005/2014).

Empirical research has focused on multiple pathways to explain the processes by which maltreatment undermines emotion regulation. One process is through disruptions to the developing stress-response system. For example, physiological measures show that maltreatment during infancy and early childhood disrupts the body's hormonal response to stress by altering the developing hypothalamic-pituitary-adrenal (HPA) system (for a full review, see Tarullo & Gunnar, 2006). In cases of maltreatment, elevated levels of cortisol and other stress hormones flood and disrupt the developing

HPA system by altering basal HPA activity and reactivity (Tarullo & Gunnar, 2006). For infants younger than 12 months, even relatively "subtle" forms of maltreatment, such as physical punishment or emotional withdrawal by mothers, are associated with elevated levels of cortisol and disrupted HPA functioning, setting the foundation for regulatory difficulties in the future (Bugental, Martorell, & Barraza, 2003). Maltreatment under the age of 3 is also associated with compromised neuropsychological functioning in preschool in terms of sensorimotor, visuospatial processing, memory, and language abilities (Pears & Fisher, 2005).

Another process by which maltreatment undermines healthy development is through emotion dysregulation. Compared to their nonmaltreated peers, maltreated children respond to interpersonal stress with increased aggression and dysregulated patterns of emotional response and regulation, hindering children's abilities to attend to interpersonal emotional cues in the environment (Cummings et al., 1994; Kim-Spoon et al., 2013; Luke & Banerjee, 2013; Maughan & Cicchetti, 2002). For example, in a sample of school-age children, Kim-Spoon and colleagues (2013) found an enduring effect of maltreatment (with approximately 75% of the sample victimized before age 3) on teacher-reported increased emotion lability and negativity (i.e., accelerated arousal, reactivity, and expression of negative emotions in response to emotion-eliciting stimuli) across ages 7, 8 and 9, which then contributed to poor emotion regulation at future time points. Cummings and colleagues (1994) observed that physically abused boys experienced heightened arousal and aggressiveness in response to simulated inter-adult anger directed towards their mothers as compared to non-abused boys. Using the same simulated anger procedure, Maughan and Cicchetti (2002) observed that maltreated

children ages 4 to 6 with documented reports of physical abuse and/or neglect, displayed more dysregulated patterns of emotion regulation. Dysregulation presented itself as either underregulation of reactivity and disorganized positive and negative emotionality, or overcontrolled regulation and unresponsive emotionality (in contrast, nonmaltreated peers were more likely demonstrate appropriate concern and well modulated levels of negative affect). In addition to regulatory issues, children with a history of maltreatment also struggle with other emotional processing abilities such as emotional understanding, emotion recognition, perspective taking, false belief understanding, and attribution bias (for a full review, see Luke & Banerjee, 2013).

Disrupted emotion regulation processes may also be one mechanism by which maltreatment leads to future socioemotional maladjustment and psychopathology. When tested empirically, difficulties with emotion regulation mediate associations between maltreatment and internalizing and externalizing symptoms, peer acceptance and rejection, rates of bullying and victimization in childhood (Kim & Cicchetti, 2010; Kim-Spoon et al., 2013; Maughan & Cicchetti, 2002; Teisl & Cicchetti, 2007; Shields & Cicchetti, 2001), and symptoms of post-traumatic stress disorder (PTSD) in adults (Burns et al., 2010).

In sum, this body of research describes the deleterious effect toxic caregiving experiences have on the developing regulatory processes of young children, undermining future socioemotional wellbeing and mental health. Given an ecological perspective, other caregiving contexts that offer stability and sensitive caregiving that meets the emotional needs of victimized infants and toddlers may buffer some of the negative effects of maltreatment.

The Role of Child Care

High quality child care can be conceptualized as a developmental asset, in which the proximal processes between teachers and children act as a possible compensatory mechanism for the regulatory difficulties of victimized infants and toddlers. Victimized infants and toddlers tend to receive few mental health services in response to maltreatment, and services tend to be disproportionately allocated to older children (Leslie, Landsverk, Ezzet-Lofstrom, Tschann, Slymen, & Garland, 2000; Stahmer, Leslie, Hurlburt, Barth, Webb, Landsverk et al., 2005), making existing settings of support, such as child care, critical. Research that examines the effects of child care (and specifically teacher caregiving quality) on the emotion regulation development of victimized infants and toddlers is limited; however, evidence from child care research in the general population, as well as research with samples of maltreated preschool children, provides a promising foundation for moving forward with research on victimized infants and toddlers.

Importance of high quality child care for infants and toddlers. A great body of evidence supports quality child care as an important developmental context for children (Burchinal et al., 2008; Love et al., 2003; Love et al., 2005; Peisner-Feinberg et al., 2001; Phillips & Lowenstein, 2011; Vandell et al., 2010; Vogel et al., 2010). Quality programs create developmentally appropriate environments that are in tune with children's needs by implementing a variety of *structural* (e.g., small class size, low teacher child ratios, staff training) and *process* (e.g., sensitive-responsive teacher-child interactions) program components. Process quality is the most critical mechanism for

supporting emotional development in this setting (Hamre, 2014; Mortensen & Barnett, 2015; Phillips & Lowenstein, 2011).

Concurrent and longitudinal examinations of the effects of teacher caregiving quality have found that caregiving characterized by sensitive, responsive, and positive behaviors is associated with a variety of indicators of socioemotional wellbeing such as higher emotional engagement, social competence (Burchinal et al., 2008; Love et al., 2005), social development in elementary school (Peisner-Feinberg et al., 2001), and reduced behavior problems in adolescence (Vandell et al., 2010). Evidence for the effect of teacher caregiving quality specifically for the development of emotion regulation is limited (Mortensen & Barnett, 2015); however, evidence in related areas suggests that teachers play a critical role in these processes. Teacher-child relationship quality and teacher-child attachment are associated with fluctuations in children's cortisol levels, having potential implication for developing regulatory systems (Lisonbee et al., 2008; Badanes, Dmitrieva, & Watamura, 2012). Teachers also engage infants and toddlers in synchronous interactions to promote emotion regulation such as warm limit setting, watching for infant cues and bids for emotional reactions, using verbal reinforcement to encourage positive emotional expression, and providing physical comfort, empathy, or using redirection to help children work through negative emotions (Ahn, 2005; Feldman & Klein, 2003; Lee, 2006). Additionally, evidence suggests that there is significant variation in the effects of child care depending on risk factors such as poverty, family demographic risk, or biological dispositions such as genetics or temperament (Belsky & Pluess, 2013; Peisner-Feinberg et al., 2001; Pluess & Belsky, 2009; Votruba-Drzal et al., 2010; Watamura et al., 2011), with children facing the most risk typically showing the

greatest gains when exposed to high-quality child care, including sensitive and responsive teacher-child interactions.

As the research continues to develop in this area, special consideration needs to be paid to maltreated infants and toddlers. The cumulative risk factors these children experience may position them to make great gains in quality child care that provides them with a stable caregiving environment and sensitive-responsive caregivers; however, given the significant threats to emotion regulation development these children face, research with non-maltreated samples may be limited in application, and these children may have additional developmental needs that could be better addressed in this context.

Emerging evidence with victimized preschoolers. Little research has empirically tested the effects of child care on the development of victimized infants and toddlers; however, emerging research with samples of preschool children points towards the promising role of child care programs in improving outcomes for these children. For example, for children living in non-parental and foster care arrangements, Head Start and other school readiness interventions have been shown effective at improving teacher-child relationships, reducing behavior problems, and improving emotion regulation strategies that help children work effectively in the classroom (Lipscomb et al., 2013; Pears, Fisher, Kim, Bruce, Healey, & Yoerger, 2013). Close teacher-child relationships may also be especially significant in reducing externalizing problems for these children, as compared to their low-income, non-maltreated peers (Lipscomb et al., 2014).

Victimized children make developmental gains within quality preschool settings, but still lag behind their non-maltreated peers, pointing to the limits of traditional early education settings in providing the types of therapeutic experiences necessary for these

children. For example, Dinehart, Manfra and colleagues (2012) examined the connection between preschool accreditation status (e.g., accredited by an organization such as the National Association for the Education of Young Children, or Accredited Professional Preschool Learning Environment) and the developmental outcomes of 3 and 4-year-old children in the child welfare system receiving child care subsidies to attend community-based preschool programs. This sample was comprised of children involved in child welfare services at any level, including children living with biological parents, relatives, or in foster care. Accreditation status was associated with increased language, cognitive, and motor outcomes for children in child welfare, as compared to non-victimized children in the same programs; however, performance at the end of preschool was still worse overall compared to their peers. Further, children in child welfare were less likely to attend accredited centers. Similarly, Kovan and colleagues (2014) found that despite attending high quality preschool (as indicated by a high rating with a state quality rating and improvement system), and showing developmental gains over time, low-income children in child welfare (including any child with an accepted report of maltreatment) had higher teacher ratings of aggression and anxiety/withdrawal at the end of preschool than their low-income peers not involved in child welfare.

Importantly, research also suggests that traditional operationalization of process quality may not be appropriate for children who are facing regulatory difficulties as sequelae of maltreatment. Lipscomb and colleagues (2014) examined composite scores of the Early Childhood Environmental Rating Scale (specifically items that assessed interactions, [ECERS]; Harms, Clifford, & Cryer, 1998) and Caregiver Interaction Scale (CIS; Arnett, 1989) in relation to preschool children's externalizing problems. The

ECERS and CIS (two widely used measures of classroom quality) operationalize quality teacher-child interactions as sensitive, responsive, autonomy-granting, emphasizing the use of gentle discipline and guidance (whereas harsh, directive, or permissive behaviors are operationalized as lower quality). In their study, increased process quality (i.e., increased composite ECERS and CIS scores) was unrelated to externalizing problems for children living in parental care, but was associated with significant increases in externalizing problems for children living in non-parental and foster care arrangements. Researchers hypothesized that the emotional dysregulation these children face may require more targeted and structured teacher-child interactions to facilitate positive behavior development that is not captured in the ECERS and CIS. The child-centered, autonomy supporting behaviors captured in these measures, while creating a supportive caregiving environment overall, may not be the types of teacher behaviors that help children manage severe emotional dysregulation. In contrast, teacher-perceived closeness with individual children did operate as a protective factor for children living in non-parental care, further suggesting that proximal interactions between teachers and individual children may be more critical than global assessments of classroom process quality.

Taken together, emerging evidence with preschool children points towards the potential for high quality child care to serve as a developmental asset for maltreated children, but traditional high quality programs may be limited in effectiveness, with the possibility that maltreated children are in need of more structured support in managing regulatory difficulties in the classroom. Given the immaturity of infants' and toddlers' regulatory systems, it is critical to explore these processes with this age group to

determine if current conceptualizations of high quality child care in infant/toddler classrooms contribute to positive regulatory development in the face of maltreatment. Their immature regulatory systems may make young infants more open to influence from other sensitive caregivers. Alternatively, the exacerbated effects of maltreatment at this age may lead to more challenges in ameliorating emotional wellbeing. Process quality for infants and toddlers who have been maltreated, including the potential need for more structured support from teachers to manage regulatory difficulties, needs to be determined along with the components of structural quality that help facilitate this (e.g., lower teacher-child ratios or smaller class sizes). Furthermore, special consideration must be paid to infants and toddlers living in foster care or non-parental settings. In addition to the toxic interactions that lead to removal, these children face the added stress of instability and separation from their primary attachment figures, which may contribute to variations in how teacher caregiving quality in a stable child care setting affects developing regulatory processes.

How Can Child Care Better Serve Maltreated Infants and Toddlers?

Literature from a variety of areas provides suggestions for how child care centers can serve as better developmental assets for the regulatory development of maltreated infants and toddlers. Suggestions such as enhanced teacher training, integration of a trauma-informed perspective of care structuring child care as a community of support for parents, and supporting policies that encourage collaboration across systems can better position child care within a coordinated network of settings and professionals aiding maltreated infants and toddlers (Daro & Benedetti, 2014; Osofsky & Leiberman, 2011). From a community approach to maltreatment prevention, strengthening child care centers

in this way has the added benefit of reaching a wide array of families, not just those already identified by the child welfare system (Daro & Dodge, 2009).

Early childhood teacher training. Given the critical nature of teacher caregiving quality for children's wellbeing in child care, it is important that teachers are well trained to manage the unique caregiving needs and challenges of maltreated infants and toddlers. As reviewed earlier, emotional sequelae of maltreatment may include disruptions to the developing stress-response system, neuropsychological impairment, dysregulated patterns of emotional responses and regulation, as well as altered emotional processing (Tarullo & Gunnar, 2006; Pears & Fisher, 2005; Maughan & Cicchetti, 2002; Luke & Banerjee, 2013). As a result, maltreated infants and toddlers may exhibit a variety of intense emotions and atypical behaviors in the classroom, posing distinct caregiving difficulties for teachers. Teachers, especially those working with high-risk families, should have a thorough understanding of the physiological and psychological mechanisms underlying the emotions and behaviors infants and toddlers may exhibit as a result of maltreatment. Having this understanding may help them facilitate developmentally appropriate responses by limiting teachers' own feelings of frustration that may arise from stressful interactions, including being mindful of their own emotional responses (Zindler, Hogan, & Graham, 2010). Unfortunately, there is no empirical research that evaluates the preparedness of child care teachers and staff to provide quality care to this population (Dinehart, Katz et al., 2012). Moreover, child care teachers and staff report frustration in communicating with the child welfare system in terms of being provided adequate information about the unique developmental needs of these children, limiting their ability to provide the best care possible (Ward et al., 2009). In a series of

focus groups, professionals in educational and child welfare settings identified ineffective and limited communication, role uncertainty, and complexity of behavioral health needs of children as the major barriers for collaboration across systems (Noonan, Matone, Zlotnik, Hernandez-Mekonnen, Watts, Rubin et al., 2012).

Lack of information for teachers regarding the specific developmental needs of maltreated infants and toddlers may mistakenly lead to inappropriate responses to emotion dysregulation; however, a larger challenge that must first be addressed is determining the exact nature of developmentally appropriate practices for victimized infants and toddlers, and how these practices may differ from traditional early education best practices. As reviewed by Dinehart, Katz and colleagues (2012), a variety of early education curricula include young children's socioemotional health as a major program component (e.g., Incredible Years, PATHS); however, emerging evidence suggests that traditional developmentally appropriate practices for preschool children (as measured by widely-used indicators of process quality such as the ECERS and CIS) may not provide the direct, targeted support maltreated children need to support their regulatory development (Lipscomb et al., 2014). As research moves forward in this area, there is a great need to understand how these processes are unique to teacher-child interactions in infant/toddler child care, given the specific regulatory needs of young children, and how teachers can adapt their caregiving practices to best serve these children.

Trauma-informed care. An infant mental health perspective of maltreatment conceptualizes abuse and neglect as trauma, meaning "an unanticipated exceptional event that is powerful and dangerous in which a feeling of helplessness overwhelms the child's capacity to cope" (Zindler et al., 2010, p. 7). From this perspective, life-long mental

health begins in infancy and traumatic environmental experiences place infants and toddlers at risk for a variety of mental health problems. The integration of a trauma-informed perspective of care within child care may be beneficial, as child care providers often lack training in the specialized mental health needs of infants and toddlers who have experienced trauma (Dinehart, Katz et al., 2012; Osofsky & Leiberman, 2011; Zindler et al., 2010). Zindler and colleagues (2010) describe that trauma-informed care must emanate from sincere validation of the trauma associated with losing the security of a primary attachment figure. From this perspective, intense behaviors and emotions children exhibit are understood as symptomatic of coping with trauma; teachers then use their established sensitive caregiving relationship as a buffer to prevent negative emotions and behaviors from accelerating. A trauma-informed perspective may provide teachers with more detailed and comprehensive strategies for managing regulatory difficulties, and understanding their role in these processes. Additionally, it will be important to consider how these perspectives fit with the previously mentioned emerging research on unique developmentally appropriate process quality for this population of children.

While this perspective may provide an important new dimension to early childhood teacher training, it is also necessary to recognize the limits of child care programs in providing the advanced-level mental health care or specialized therapeutic environments children may require, as these services are likely beyond the scope of what traditional programs are designed to offer (Kovan et al., 2014). One solution to building a coordinated system of care for victimized infants and toddlers is the incorporation of specialized early intervention services within child care to ensure that children are

provided with mental health services as needed (Daro & Benedetti, 2014; Kovan et al., 2014). Osofsky and Leiberman (2011) stress that one major barrier in creating coordinated systems of care for victimized children is the severe lag time between identification of needs and receiving services. As an important caregiving setting for many children and families, child care centers are an existing point of entry for identifying children in need of psychological intervention with mental health professionals and greater integration with the infant mental health system (Osofsky & Leiberman, 2011). Another strategy includes providing mental health consultations to teachers and staff. Mental health consultation services that help adults in the center understand and develop strategies for addressing stressful and challenging behaviors may increase staff self-efficacy and confidence, reduce job-related stress and staff turnover, as well as contribute to a higher quality educational environment (Brennan et al., 2008).

Creating a community of support. In addition to working with children directly, child care centers are poised to serve as sources of support for families involved in child welfare or are high risk for maltreatment, extending their role beyond basic child care services (Jones Harden et al., 2012). Given an ecological perspective, family-child care partnerships are a more distal form of support for the regulatory difficulties victimized children incur: supportive caregiving partnerships between teachers, staff, and parents (i.e., *mesosystem* influence) trickle down to parent-child proximal processes, with the aim of reducing maltreatment. Improving parent-child interaction quality has been a long-standing goal of many center- and home-based early care and education programs for sociodemographic high-risk families. These programs have demonstrated the potential for altering parent-child interactions in the context of early care and education

with success in improving positive parenting behaviors, child engagement, and home learning environments, as well as reduced spanking and harsh discipline (Kelbanov & Brooks-Gunn, 2008; Love et al., 2005; Lee, Zhai, Brooks-Gunn, Han, & Waldfogel, 2014). Home-visiting program such as Nurse Family Partnership and Healthy Families America, have also demonstrated reductions in maltreatment, with a major program component of both programs being a focus on parental knowledge of child development, reading infant cues, and responding in ways that facilitate socioemotional development (Avellar, Paulsell, Sama-Miller, & Del Grosso, 2012). Few center-based programs have been empirically tested as preventative interventions for maltreatment specifically (for a meta-analysis on this topic see Reynolds et al., 2009), but evidence from two-generation child care programs such as Early Head Start (Green, Ayoub, Bartlett, Von Ende, Furrer, Chazan-Cohen et al., 2014; Love et al., 2005) and Chicago Child-Parent Centers (Reynolds & Robertson, 2003; Mersky, Topitzes, & Reynolds, 2011) points towards the potential for reducing child maltreatment in a center-based context by integrating family support services within child care.

Early Head Start (EHS), a federally funded early care and education program, provides child care and family services to socioeconomically disadvantaged families prenatally until age 3 (Love et al., 2005). In a retrospective examination of child welfare data for a subsample of participants from the Early Head Start Research and Evaluation Project (EHSRE; a nation-wide randomized controlled trial of EHS programs), Green and colleagues (2014) found that, as compared to families who did not receive EHS services, EHS families who participated in home-based, center-based, mixed services had significantly lower odds of a child welfare encounter when children were ages 5 to 9, and

had significantly fewer encounters overall from age 5 and older. EHS children had significantly fewer reports of physical and sexual abuse; however, rates of neglect were significantly higher. Researchers hypothesized a "surveillance" effect, meaning that children in EHS were more closely monitored by mandated child reporters than the control children, so neglect was less likely to go unnoticed (Green et al., 2014). For preschool children, Chicago Child-Parent Centers (CPC) is one of the only center-based programs designed with the specific aim of reducing maltreatment (Reynolds, Mathieson, & Topitzes, 2009). CPC programs provide preschool and family support services to low-income children ages 3 to 5, and extends family support services until second grade. Parents participate in a variety of support services in parent-specific resource rooms at school, receive assistance with parenting and vocational skills, and build social support with staff, teachers, and other parents. Empirical evaluation of the program has found that extensive CPC participation (i.e., 4 to 6 years) starting in preschool is effective at reducing cumulative rates of maltreatment from ages 4 to 17, as measured by court petitions of maltreatment and Department of Child and Family Service (DCFS) reports (Reynolds & Robertson, 2003).

The key mechanisms in reducing maltreatment in these types of programs is supporting parents' capacities to effectively interact with their children, as well as building caregiver partnerships within the program. Although not empirically tested, researchers hypothesized that known EHS program impacts such as improved positive parenting practices, improvements to the maternal life course, and increased socioemotional competency in children at 36 months (Love et al., 2005), were the mechanisms by which reductions in maltreatment occurred (Green et al., 2014). For CPC

programs, parent involvement, as well as school placement stability, were significant mediators of program effectiveness, indicating that parents who were actively involved in family support services at the school, without disruption due to changing schools, engaged in fewer maltreating behaviors (Reynolds & Robertson, 2003). More nuanced mediator models of CPC effectiveness have also demonstrated that parent involvement in family support services has a direct inverse association with child maltreatment from ages 4 to 17, as well as an indirect association via a reduction in child behavior problems in childhood (Mersky et al., 2011).

In contrast to child care interventions targeting high-risk families, the Strengthening Families Initiative (SFI), developed by the Center for the Study of Social Policy, is an evidence-informed prevention initiative designed to reach a wide range of children and families in child care programs (Harper Browne, 2014; Daro & Dodge, 2009). SFI operates from a strength-based perspective, focusing on cultivating resiliency within the family with the goal of minimizing the effects of toxic stress on children's developing systems. SFI provides child care centers with a framework for fostering five protective factors: parental resilience, social connections, knowledge of parenting and child development, concrete support in times of need, and child socioemotional competence (Daro & Dodge, 2009). Since 2003, 34 states have joined the SFI National Network, with state-level coordinators that assist with implementation by helping centers align their practices in a way that builds family strength in the five protective factors. Emerging empirical evidence suggests that SFI may improve quality care provided to children via improving quality training provided to staff, engaging program directors, and improving the organizational climate of the program (Douglass & Klerman, 2012).

In sum, child care programs may have the potential to reduce the likelihood of victimization with the incorporation of services that help parents engage in appropriate parenting behaviors, and improve their own lives, while fostering a community of support with other parents and staff. Or simply put, "creating environments that facilitate a parent's ability to do the right thing" (Daro & Dodge, 2009, p. 68). This community-oriented perspective of bringing together formal and informal support in all contexts that families engage with stands in contrast to the traditional thinking of targeting individual parents for intervention (Daro & Dodge, 2009; Daro & Benedetti, 2014). Given the lack of research in this area, especially for infants and toddlers, there is a great need to further identify the pathways by which child care programs reduce the likelihood of victimization, in order to strengthen program effects (Green et al., 2014). An important caveat to this is being mindful of the limits of child care; child care centers cannot provide all services to all families, especially to children who have experienced trauma; child care likely will never shield these children completely from the effects of maltreatment, but it can serve as a source of support that buffers some negative impacts (Daro & Benedetti, 2014).

New Directions

Recent efforts from the U.S. DHHS have focused on building more coordinated systems of care by encouraging interagency collaboration between child care (including EHS) and the child welfare system, such as formally establishing joint screening and referral protocols to address family needs, joint referral protocols for child care subsidies and EHS services, and increased child care staff training to recognize the need for referrals to the child welfare system (U.S. DHHS 2011a, 2011b). Additionally, U.S.

DHHS has provided funding opportunities for communities to build the infrastructure necessary to maximize high quality child care services for children under the age of 5 in foster care (U.S. DHHS, 2011c). As collaboration and research opportunities move forward in this area, the literature presented in this review identifies areas of research that should be included in these efforts to best understand how to support maltreated infants and toddlers within child care settings.

Most importantly, research is needed that specifically focuses on infants and toddlers. This population has the highest rates of victimization, and is the most vulnerable to the negative emotional sequelae of maltreatment, yet research that examines connections between child care experiences and maltreatment has primarily focused on preschool-aged children. First, more descriptive statistics are needed for the basics of child care use for this age group, including infants and toddlers with different levels of involvement with the child welfare system, such as reports of maltreatment, substantiated cases, and those living in non-parental or foster care (e.g., Meloy & Phillips, 2012b). Additionally, more information is needed regarding access to high quality care, including subsidy use, and how this varies by parental, non-parental, and foster care arrangements. Second, more research is needed specific to infants and toddlers because regulatory processes are just emerging during this developmental time period. In terms of understanding the role of caregiving experiences in child care for these children, it will be critical for research to elucidate whether infants and toddlers are more open to the protective influence of other quality caregivers because their regulatory processes are just developing, or if the impact of maltreatment on emotion regulation at this vulnerable age is too great for the buffering effect of child care, especially normative models of high

quality care. Third, research from non-maltreated samples provides an important foundation for hypothesizing why quality caregiving experiences (i.e., proximal processes) in child care are important for the regulatory needs of these children, but conclusions from these samples may be limited in application. Research with maltreated preschool samples has examined the effect of child care quality as measured by accreditation status and state quality rating systems, but more research is needed on elements of process quality, as it is the most salient aspect of child care quality in socioemotional outcomes. Finally, there is a great need to better understand the exact nature of developmentally appropriate process quality for this unique population. Infants and toddlers who have experienced maltreatment and trauma may not respond to the same traditional conceptualizations of process quality, and would benefit from more targeted behavior and emotional support, integrating early education teacher training with infant mental health and trauma-informed perspectives of care. In sum, moving research forward in this way will help researchers better understand the potential for caregiving relationships in child care to serve as developmental assets for this vulnerable population, and provide insight as to the optimal structuring of teacher education and early care and education experiences in ways that best facilitate healthy emotion regulation development for maltreated infants and toddlers.

CHAPTER V: CONCLUSIONS

Overview of the Three Papers

The aim of the three papers presented in this dissertation was to examine the potential protective role of center-based child care for infants and toddlers, with specific attention to threats to emotion regulation development from different aspects of parenting risk at home: harsh and intrusive parent-child interactions, behaviors that were characterized by minimal support and sensitivity, as well as physically abusive and neglectful behaviors. Guided by an ecological perspective, the two empirical papers, which drew data from participants in the Early Head Start Research and Evaluation Project (EHSRE) who attended center-based child care when they were 14 months old, and the one theoretical review paper, highlighted the complex nature of understanding children's interactions with different caregivers in home and child care contexts.

The first paper examined the moderating role of child care quality in mitigating reciprocal associations between negative parenting behaviors and young children's emotion regulation across toddlerhood. While results suggested that significant inverse associations between negative parenting and emotion regulation at 14 months set the stage for poorer parenting and emotion regulation outcomes at 36 months, high quality child care was not a significant moderator of these processes. The second paper examined trajectories of emotion regulation development from 14 to 36 months, testing the interactive effect of maternal support, infant negative emotionality, and child care teacher sensitivity in this change over time. Results of a significant three-way interaction of these variables suggested that infants who displayed higher negative emotionality were more susceptible to the protective effect of high teacher sensitivity in child care when

maternal support at home was low. Finally, the third paper reviewed the literature connecting the emotion regulatory development needs of infants and toddlers who have experienced maltreatment to caregiving experiences in child care. The synthesis of this literature helped identify the need for research targeted to infants and toddlers, specifically focusing on classroom process quality, developmentally appropriate practices, and early childhood teacher training for this unique population.

Summary of Findings

The findings from all three papers highlight important concepts regarding the development of emotion regulation for this subsample of EHS-eligible and EHS-participating children attending center-based child care. Empirical results suggested that parent-child interactions during early toddlerhood were particularly salient to emotion regulation outcomes. Parenting that was characterized as low in support was associated with lower emotion regulation, and parenting behaviors characterized as harsh and intrusive, were associated with lower observed emotion regulation at future time points. Moreover, the synthesis of literature clearly demonstrated the lasting deleterious impact of early maltreatment on developing emotion regulation processes. Taken together, proximal processes between parents and children in the home microsystem that are unsupportive of infants and toddlers developing regulatory capabilities pose significant risk to emotion regulation outcomes.

Findings from the empirical papers also highlighted the active role children play in these processes. Negative parenting was associated with subsequent emotion regulation, but emotion regulation was also associated with subsequent negative parenting. Moreover, children's own temperamental reactivity was associated with the

manner in which caregiving experiences at home and in child care were associated with emotion regulation development. Given ecological and transactional models of development, it is critical to consider children's own role in eliciting responses from caregivers, and that the developmental outcomes of certain children are more susceptible to variation in caregiving experiences than others. This has important implications for educating parents and other caregivers to respond effectively to challenging caregiving situations to prevent entrenching caregivers and children in coercive cycles of interactions or creating a negative caregiving context that places young children at risk.

Finally, each paper highlighted the complexity of trying to understand the protective role of quality experiences in child care for infants and toddlers whose emotion regulation development is undermined by negative parenting experiences at home. Child care quality, conceptualized as combined teacher sensitivity and classroom quality, was unrelated to emotion regulation and negative parenting, both directly and as a moderating variable. Teacher sensitivity was associated with change in emotion regulation over time, but only when considered in combination with maternal support and infant negative emotionality. Specifically, for infants with high negative emotionality, teacher sensitivity was an especially important protective factor when maternal support was low. The role of caregiving experiences in child care is also complicated for infants and toddlers who have experienced maltreatment, given the unique regulatory challenges these children face, as well as developmentally appropriate practices for this vulnerable population.

Implications and Next Steps

The papers presented in this dissertation suggest multiple paths for moving forward with this line of research. First, it is important to consider the validity of

utilizing classroom-level measures of child care and teacher caregiving quality to explain variation in emotion regulation, when the theoretical underpinnings of these associations are based on reciprocal, transactional proximal processes. Measures that capture dyadic teacher-child interactions within the classroom context may be a more accurate depiction of these assumed proximal processes, and may tell a different story than classroom-level measures. Capturing reciprocal interactions between teachers and children, or including teacher sensitivity as a time-varying variable in growth models, across large spans of time, is complicated by the fact that the majority of children change child care teachers with each school year. In moving forward with research in this area, future research needs to find ways to capture dyadic exchanges between teachers and children within the constraints of the child care structure, or possibly examine additive effects of teacher sensitivity across multiple years of child care.

Additionally, the role of teacher sensitivity in the development of emotion regulation appears to be very nuanced; empirically, no direct associations or bivariate correlations were found between teacher sensitivity (or classroom quality) and emotion regulation. Instead, teacher caregiving, maternal caregiving and child characteristics needed to be considered in combination. Future research must continue to test complex interactions to elucidate *for whom* quality experiences in child care are most critical. Empirical evidence of this nature will inform early care and education intervention training efforts to help teachers meet the needs of children who present caregiving challenges in the classroom, but stand to make the greatest developmental gains in a supportive environment. Further, teacher sensitivity was only related to *change* in emotion regulation across time (rather than mean levels of emotion regulation at each

time point) highlighting the importance of longitudinal research designs that capture within-individual change across multiple years of child care to truly understand the role of caregivers in emotion regulation development.

Finally, if caregiving experiences in this setting are going to serve as developmental assets for infants and toddlers facing parenting risk at home, early childhood teacher training must be refined. Future research needs to continue to explore the exact nature of teacher sensitivity in facilitating the development of emotion regulation, as well as teachers' preparedness to manage challenging regulatory behaviors in the classroom, and especially the unique trauma-related mental health needs of maltreated infants and toddlers.

Summary

The aim of the three papers presented in this dissertation was to explore the potential for caregiving relationships in center-based child care to serve as developmental assets for infants and toddlers facing parenting risk at home. Parenting risk was conceptualized as behaviors that negatively impact the development of emotion regulation, ranging from behaviors that provided minimal sensitivity and support, to behaviors that were harsh and intrusive, to the most extreme forms of physical abuse and neglect. Collectively, results confirmed the deleterious impact parenting risk at home has on emotion regulation; however results regarding the protective nature of high quality child care experiences were mixed. While ecological models of development provide a strong theoretical foundation for conceptualizing the proximal processes in child care as critical for this development, more appropriate measures of caregiving experiences in

child care and nuanced statistical models are needed to understand the protective role of child care in these processes.

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