



The Protective Effects of Maternal and Paternal Factors on Children's Social Development

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Abstract

The goal of this study is to examine associations among family and child protective factors, maternal and paternal levels of distress, and children's social competence in a sample of 156 ethnically and socioeconomically diverse first-time mothers and fathers, and their children, followed from 9 to 30 months of age. Using multiple linear regression modeling, our results indicate that dyadic synchrony and children's positive temperament during infancy are significantly associated with fewer behavior problems and paternal optimism with high levels of social competence at 21 months (main effects). Father optimism and child positive temperament are only significantly related to higher levels of social competence and fewer behavioral problems, respectively, in the context of low levels of paternal distress (interaction effects). These results suggest that in our sample maternal dyadic synchrony operates in the same way across levels of maternal distress as it relates to children's behavior problems, with the exception of paternal optimism and children's positive temperament. The results also suggest that protective factors are different for mothers, fathers, and children.

Keywords Mothers · Fathers · Resilience · Protective factors · Ethnically diverse families

Decades of research have extensively shown that children growing up in adverse circumstances, such as poverty, are more likely than their peers to exhibit less optimal adaptation (Cabrera, Fagan, et al., 2011b; Duncan & Murnane, 2011; Gershoff et al., 2007). Concerned with how adversity threatens human adaptation, researchers have sought to understand the processes through which positive outcomes are gained in the context of adversity (Masten, 2001; Masten, 2018). The extensive empirical literature on resilience, broadly defined as the capacity to adapt successfully to adverse conditions that threaten development, has identified individual- (e.g., self-regulation) and family-level (e.g., nurturing parenting) factors that may be protective in the context of adversity (Masten, 2018; Masten & Cicchetti, 2016;

Orthner et al., 2004; Vanderbilt-Adriance & Shaw, 2008b; Wright & Masten, 2005).

Yet, as various scholars have argued (Masten, 2018; Vanderbilt-Adriance & Shaw, 2008b), there are still significant limitations to our understanding of the child and family factors that support resilience. First, there are few longitudinal studies of resilience focusing on protective factors in infancy (e.g., Collins, 2013; Dubowitz et al., 2016; Harmeyer et al., 2016; Palermo et al., 2019; Vanderbilt-Adriance & Shaw, 2008a; Werner, 1993). Second, research examining family-level protective factors such as parenting rarely includes fathers' caregiving. Positive father involvement has been shown to be associated with children's development both directly and indirectly by protecting children from risk such as maternal depression (e.g., Cabrera et al., 2007; Lewin et al., 2015). Third, there is a relative lack of information on the protective factors that result in resilience among ethnically and economically diverse families, in particular during infancy. Despite growing up in poverty, many ethnically diverse children develop the social skills they need for success in school and beyond (Cabrera et al., 2007; Ryan et al., 2006; Zhang et al., 2020). The study of resilience together with the study of vulnerabilities can help to inform theories and guide public policy and intervention efforts to increase the likelihood that children

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growing up poor will be well adjusted (Becvar, 2013; Masten, 2001; Wright & Masten, 2005).

Thus, we examined the associations among multiple child and family protective factors and children's positive social adjustment in a sample of urban and ethnically and economically diverse first-time mothers and fathers, and their children followed from infancy to preschool. Following Vanderbilt-Adriance and Shaw's (2008a) methodological approach to understand resilience across different levels of risk, we examined the association between protective factors and toddlers' positive social adjustment depending on the intensity or level of family distress risk.

Theoretical Background

Our study is framed within a relational developmental systems framework used in the field to study resilience (Masten, 2018). Rooted in family system and ecological theories, this framework suggests that families are systemic units (e.g., mothers, fathers, and children) of interconnected relationships and action patterns where individuals respond and interact with one another as individuals and as mothers and fathers (i.e., parent-child subsystem). Resilience depends on the interactions with other systems, in particular parents who are most influential on children's development. Central to the systems framework to study resilience is the importance of identifying protective processes (Masten, 2018). Protective factors are typically defined as characteristics of the child, family, and broader environment that buffer or reduce the negative effects of adversity on child outcomes (Masten, 2013; Masten & Cicchetti, 2016; Masten & Reed, 2002). Scholars have identified protective processes at the family and individual levels.

Protective Factors

Family-Level Proactive Factors At the family level, the protective factors that link parenting to individual child resilience have received the most empirical attention. Nurturant parenting has been most studied and is empirically associated with positive outcomes for children even in the context of adversity (Masten, 2018; Masten & Monn, 2015; Masten & Reed, 2002; Vanderbilt-Adriance & Shaw, 2008a). Various dimensions of nurturant parenting, such as being warm, responsive and sensitive to children's needs, and providing positive reinforcement, even in the context of risk, have been associated with fewer behavior problems and better peer social competence (Baker, 2017; Cabrera et al., 2007; Cabrera, Fagan, et al., 2011b; Jeon & Neppel, 2019; Newland, 2015; Serrano-Villar et al., 2017). Fathers who are responsive and sensitive to their children's needs have children with better cognitive scores

and better social skills compared to toddlers whose fathers are classified as more negative or intrusive (Baker, 2017; Cabrera et al., 2007; Ryan et al., 2006).

Of particular importance for young children is the quality of parent-child interactions (i.e., being warm and responsive during parent-child interactions), which are critical for the development of children's skills (Landry et al., 2006; Provenzi et al., 2018). Studies show that children who report having a good relationship with their fathers are perceived to have more positive peer relationships and fewer behavioral problems than children who report not being close to their fathers (Cabrera, Cook, et al., 2011a). Zhang et al. (2020) found that warm/stimulating Latina and African American mothers had infants with low levels of total problem behaviors (i.e., internalizing, externalizing, and dysregulated behaviors) than mothers who were less stimulating. Other studies have shown that dyadic synchrony (i.e., the jointly responsive, emotionally warm, and mutually regulated interaction between caregivers and children) is significantly related to children's social competence (Deater-Deckard & Petrill, 2004; Funamoto & Rinaldi, 2015; Harrist & Waugh, 2002; Lindsey et al., 2010; Lunkenheimer et al., 2020). Whether dyadic synchrony protects children from the negative effects of parents' stressors on their development is an empirical question that is addressed in this paper.

In terms of parents' individual characteristics, a burgeoning literature has identified optimism and cognitive skills as key parental characteristics that play a role in promoting resilience in children. Parents' cognitive skills such as the ability to plan and regulate their thoughts and emotions by reflecting and considering various responses to challenging situations (i.e., executive function skills) might be an important protective factor for children. When confronted with challenging situations, parents with higher levels of executive function skills may be more likely to manage their immediate feelings and respond in positive ways, which is significantly associated with children's social development (Crandall et al., 2015; Deater-Deckard, 2014; Diamond, 2013; Ochsner & Gross, 2008; Shaffer & Obradović, 2017). Similarly, studies have shown that parents who are high on optimism (i.e., the tendency to expect positive future outcomes) may have higher levels of psychological and physical health and use more adaptive coping strategies to deal with their child's behaviors (Carver & Scheier, 2014; Nes & Segerstrom, 2006; Taylor, 2011). Direct associations between mothers' and fathers' optimism and child outcomes have been demonstrated with school-aged children's and adolescents' social development (Castro-Schilo et al., 2013; Taylor et al., 2010; Taylor et al., 2012). Based on this review of the literature, we explore whether parents' executive function skills and optimism serve as protective factors against the negative effects of parents' stressors on young children's social development.

Child-Level Factors At the individual child level, children's temperament, defined as constitutionally or biologically based individual differences in emotional, motor, and attentional reactivity, and in self-regulation, demonstrating consistency across situations and relative stability over time, is one of the most well researched child characteristics that can be both a risk and a protective factor (Rothbart, 1981; Rothbart, 1986; Rothbart et al., 2000). Children perceived to have difficult temperaments (i.e., exhibit negative reactivity and have difficulty adapting to novel situations) are more likely to be at risk for negative parenting (e.g., punitive discipline) and are less resilient in the face of adversity than children perceived to be easygoing (i.e., are social, show positive affect, and adapt easily, who are likely to elicit positive responses from parents and peers; Benzie & Mychasiuk, 2009; Obradović, 2010; Sanson et al., 2011; Wang & Deater-Deckard, 2013).

Importantly, evidence has shown that some protective factors may be most effective in lower risk contexts than in contexts of high or extreme risk. To date, there has been little research on protective factors in the context of different levels of stress experienced by parents during infancy (Vanderbilt-Adriance & Shaw, 2008a; Vanderbilt-Adriance & Shaw, 2008b). More broadly, studies of the effect of environmental risk on child outcomes have found that at high levels of risk, the effects of protective factors were reduced compared to lower risk environments, such as low-income urban neighborhoods (Criss et al., 2017; Silk et al., 2007; Vanderbilt-Adriance & Shaw, 2008a). However, Easterbrooks et al. (2008) found high-quality parenting was protective even for infants at high levels of family and environmental risk. Thus, it appears that both family and environmental factors likely play a role in children's resilience to adversity in the first few years of life.

Moreover, protective factors in early childhood are of particular interest, given that interventions may be more effective when initiated in early versus later childhood (e.g., Olds, 2002). Infancy in particular is a time of great opportunity for developing resilience because systems are not fixed, which means it is also a time of developmental vulnerability (Shonkoff & Phillips, 2000). Infancy is considered a sensitive period, one where the effects of experience are more influential in shaping development (Knudsen, 2004). During the first years of life, infants' brains undergo a number of changes in its neural circuitry (Sheridan & Nelson, 2009), which underlie many of their later behaviors (Shonkoff & Phillips, 2000). Once these neural connections are established, it becomes harder to rewire them (Zeanah et al., 2011), making infancy a period that is more malleable in response to intervention.

Risk Factors

Our study is also guided by the risk perspective that certain psychological or social factors increase the likelihood that an

individual will experience poor outcomes (Harvey & Delfabbro, 2004; Specht et al., 2003). Children living in poverty face numerous stressors and adversities both at home and in the community (Evans & English, 2002; Vanderbilt-Adriance & Shaw, 2008a). Children living with parents who have multiple risk factors, including parenting stress, are most at risk for behavioral problems and low cognitive skills (Cappa et al., 2011; Crnic & Ross, 2017; de Cock et al., 2017; Rollé et al., 2017). Parents who perceive having too many role-based demands (i.e., parental overload) may also experience distress and conflict, undermining the quality of parenting (Thiagarajan et al., 2006; Voydanoff, 2002). Parental overload might be particularly salient for first-time parents who must adjust to the new demands of parenthood (Miller & Sollie, 1986). Although we found no studies examining the association between fathers' or mothers' role overload and children's development, studies have found that work-family conflict is positively associated with child social emotion dysregulation and behavior problems in preschoolers (Matias et al., 2017; Vieira et al., 2016). Because most of the work on the effects of risk on children has been conducted with mothers, scholars have argued that maternal risk is the strongest predictor of negative outcomes for children (Olson et al., 2002). However, paternal risk is also hypothesized to impact children negatively because, as part of the family system, fathers' behaviors affect others in the system including children (Cabrera, Fagan, et al., 2011b; Mills-Koonce et al., 2015; Roggman et al., 2013). In this study, we examine the association between fathers' and mothers' parenting stress and role overload during infancy and toddlers' social adjustment.

Children's Social Development

A significant issue in research on resilience is what constitutes a good outcome: is it just the presence of positive adaptation, the absence of psychopathology, or a combination of the two (Masten, 2018; Vanderbilt-Adriance & Shaw, 2008a). Moreover, being resilient in one domain of development does not necessarily mean that individuals will be resilient in others (Luthar & Zelazo, 2003). In this study, we measure social development across two domains, social competence and behavior problems.

The Current Study

The current study addresses several issues relevant to the research on resilience in families. First, in contrast to studies that have relied on cross-sectional methodologies investigating predominantly European American, middle-class samples with mothers (Shean, 2015), the present study consists of a sample of economically and ethnically diverse mothers and fathers and their children followed from age 9 to 21 months.

Second, unlike past studies, we also investigated whether the relative benefits of certain protective factors might differ depending on *levels* of maternal and paternal sources of stress, which provides a strong measure of parental risk and appreciates that stress may be experienced differently by parents in the same family and at different levels of intensity. The question of whether protective processes differ across levels of parental risk (e.g., high or low stress) is important for designing effective intervention programs and can also contribute to our theoretical conceptualization of resilience at severe levels of risk. Finally, this study evaluates the contribution of protective factors in infancy on functioning during toddlerhood, a period of development that is relatively understudied, especially in ethnically diverse families (Yates et al., 2003).

The current study has two aims: (1) to examine protective factors during infancy as predictors of children's social skills (social competence and problem behaviors) in toddlerhood in a sample of economically and ethnically diverse families; and (2) to examine the moderating role of maternal and paternal distress (i.e., parenting stress and role overload) during infancy on the association between protective factors and toddlers' social skills. Parental distress is a risk factor defined by mothers' and fathers' parenting stress and role overload measured at 9 months, and children's resilient adaptation measured in terms of few behavior problems and high levels of social competence as rated by mothers and fathers (Vanderbilt-Adriance & Shaw, 2008a). We hypothesized that specific child and family characteristics, including parents' psychological functioning and parenting behaviors, would be associated with low behavior problems and high social skills in toddlerhood. However, in line with other research comparing protective factors at different levels of high environmental risk (e.g., Gorman-Smith et al., 1999; Shaw et al., 2004; Vanderbilt-Adriance & Shaw, 2008a), we expected that within this economically and ethnically diverse sample, the protective factors would be more important at low levels of parental distress than at the highest levels of parental distress.

We ask: (1) Are protective factors (i.e., mothers' and fathers' nurturant parenting, dyadic synchrony, optimism and executive function at 9 months and easy child temperament at 12 months) associated with toddlers' social competence and problem behaviors at 21 months? (2) Does parental distress (mothers' and fathers' reports of parenting stress and parental role overload) moderate the association between these protective factors and children's social skills? We hypothesize that these protective factors would be less strongly related to children's social skills in the context of high levels of parental distress. Moreover, in line with other research comparing protective factors at different levels of risk (e.g., Easterbrooks et al., 2008; Gorman-Smith et al., 1999; Shaw et al., 2004; Vanderbilt-Adriance & Shaw, 2008a), we expected that within this ethnically and economically diverse sample of first-time parents, the protective factors would be more important

at low and moderate levels of family distress than at the highest levels of family distress.

Methods

Data Source

The proposed project uses data from the Baby Books 2 Project (BB2), an ongoing longitudinal randomized control trial of a parenting intervention. Participating families were recruited from centers that administer the Specific Supplement Nutrition Program for Women, Infants, and Children, health care clinics, ER waiting rooms, parks, and community centers in both the Washington, DC metropolitan area, and in Orange County, California. To be eligible for this intervention, parents had to be first-time parents of a baby less than 9 months of age, be co-habiting, over the age of 18, make less than \$75,000 per year, and be literate at a first-grade reading level in either English or Spanish. All infants were full term (greater than 37 weeks of gestation). Families were told that the project was aimed at understanding how reading to babies helps them learn and were offered children's books and compensation for their time.

The BB2 intervention consists of providing first-time, low-income fathers and mothers with "baby books" that have embedded anticipatory guidance (AG) messages. The baby books are designed to be read to children, while the content (i.e., AG messages) is for parents about children's development (i.e., socioemotional, cognitive, and physical development), parenting (i.e., appropriate discipline and safety practices), and co-parenting. The BB2 books are designed for children ages 9 to 24 months, an important period of rapid changes in children's development. Lastly, the BB2 books are bilingual; all content is provided in both English and Spanish. This is particularly important given the growing Spanish-speaking population in the USA (Kopack Klein et al., 2017).

BB2 uses a randomized design that includes four conditions that correspond the number and type of books given to families at each time point: (1) educational books are given to both parents (i.e., mothers receive the "mommy" books and fathers receive the "daddy" books), (2) educational "mommy" books are given to both parents, (3) educational "daddy" books are given to both parents, and (4) commercially available books are provided to both parents. BB2 collects data when children were 9, 12, 15, 18, 21, 24, and 30 months old through a series of home visit, phone calls, and online surveys. For the present study, we focus on data collected within 10 days of the child being 9, 12, and 21 months of age (e.g., 9-month wave was collected 5 days before or after the day). Mothers and fathers were interviewed separately and were asked various questions about their backgrounds, beliefs, parenting practices, mental health, and their children's health,

activities, and behaviors. Mothers and fathers were also each videotaped separately engaging in a parent-child interaction for 10 min of free play during home visits at 9 and 18 months.

Analytic Sample

The BB2 enrolled 210 families consisting of mothers and fathers, and their 9-month-old infants ($n = 420$ parents), the analytic sample for this study includes a subset of 156 families with complete data at the time of this study. The means and standard deviations for the analytic sample are presented in Table 1. When compared to the full sample, parents in the analytic sample are more likely to have graduated high school ($t = 7.108$, $p < .01$ for mothers, $t = 4.680$, $p < .05$); fathers (but not mothers) are more likely to report more distress compared to the full sample ($t = 29.61$, $p < .01$); identify as Latino, African, or African American; and include immigrant families from a variety of home countries including El Salvador, Cambodia, Taiwan, Ethiopia, and Mexico. However, the analytic sample did not significantly differ from the full sample on income, racial/ethnic makeup, or any of the protective

factors (i.e., nurturant parenting, parent-child relationship quality, executive functioning, optimism, easygoing temperament).

Measures

Dependent Variable

Social Competence and Behavior Problems When children were 21 months, mothers and fathers completed phone interviews and were asked to report on children's socio-emotional competencies via the 42-item Brief Infant-Toddler Social Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006). The BITSEA is a clinical measure designed to assess the presence of children's social-emotional competencies and problem behaviors from ages 12 to 36 months. Items include dimensions of social-emotional competence (e.g., looks right at you when you say their name, helps when someone is hurt) and behavior problems (e.g., hits, bites, or kicks you (or other parent), hurts self on purpose). Higher scores on the competence scale indicate more social skills and higher scores on the

Table 1 Demographics

Measure	Combined report ($n = 156$)		Fathers ($n = 156$)		Mothers ($n = 156$)	
	M(SD)/%	Range/ n	M(SD)/%	Range/n	M(SD)/%	Range/n
Control variables						
Child gender	48%	101				
Boy	52%	109				
Girl						
Study condition	24.8%	52				
Mom group	24.8%	52				
Dad group	25.7%	54				
Both group	24.8%	52				
Control group						
Parents' education			21.9%	34	8.3%	13
Less than high school			23.2%	36	19.2%	30
High school diploma			42.9%	59	42.9%	67
Some college			29.5%	26	29.5%	46
4-year degree or greater						
Protective factors						
Nurturant parenting			3.00 (.72)	1.33–5.00	3.20 (.68)	1.67–5.00
Parent-child dyadic synchrony			3.13 (1.17)	1.00–5.00	3.21 (1.15)	1.00–5.00
Parents' executive function			.47 (.16)	.16–1.00	.43 (.12)	.19–.96
Optimism			4.17 (.47)	2.63–5.00	4.16 (0.52)	2.38–5.00
Easygoing temperament			19.61 (2.51)	8.00–25.00	19.81 (2.67)	9.00–25.00
Risk factors						
Parents' distress ¹			.42 (.49)	0–1.00	.43 (.50)	0.100
Social competence	17.23 (2.45)	8–22				
Problem behaviors	11.63 (6.04)	0–35				

¹ Composite variable of parenting stress and role overload. Each scale was standardized and averaged and received a score of 1 if above the mean or 0 if below the mean

problem behaviors scale indicate more behavior problems. The BITSEA has been validated with diverse samples, with a median reliability coefficient of 0.70 and high concurrent validity with other standardized assessments of language ability (Briggs-Gowan et al., 2004). We used the average score of mothers' and fathers' BITSEA reports for each subscale—social competence and problem behaviors. In the reliability and validity study of the original version of the BITSEA (Briggs-Gowan et al., 2001; Briggs-Gowan et al., 2004), test–retest reliability was excellent and interrater agreement (mother/father and parent/child-care provider) was good. We used the average score because interrater agreement between mothers and fathers has been found to be acceptable.

Independent Variables

Risk Factors

Parental Distress The literature on risk suggests that more risk factors tend to have more negative impact on individuals than fewer (Appleyard et al., 2005). To capture the various sources of stress parents in our sample experience during the first year of their baby's life, we created a composite of two sources of stress, role overload and parenting stress, and labeled it *parenting distress*. Parental distress includes scores on the Parental Stress Scale (Berry & Jones, 1995) and the Role Overload Scale (Thiagarajan et al., 2006). The Parental Stress Scale (Berry & Jones, 1995) is a self-reported questionnaire containing 18 items parents are asked to agree or disagree with in terms of how their relationships with their child typically is. Items ask about themes relating to both the positive (e.g., emotional benefits, personal development) and negative (e.g., opportunity costs, demands on resources) aspects of parenting. Higher scores on this scale indicate increased stress. The Parental Stress Scale demonstrates satisfactory levels of internal reliability (.83) and test-retest reliability (.81; Berry & Jones, 1995). The parental distress composite also includes scores on the Role Overload Scale, which is a self-reported questionnaire containing 6 items asking about how overwhelmed parents generally feel (e.g., "I cannot ever seem to catch up"; "There are times when I cannot meet everyone's expectations"). This scale also has high internal reliability (.88; Thiagarajan et al., 2006). Thus, we created *two* distress variables—one for fathers and one for mothers.

Because one of the goals of this study is to advance our understanding of whether protective factors depend on the *levels* of risk (i.e., high vs. low), we dichotomized our risk variable. Although categorizing variables is a reductionist approach, by creating levels of risk, it facilitates interpretation of "how much" of the protective factors need to exist to be effective. Using a continuous variable of distress will just give us a sense that more distress is associated with worse outcomes, but it would not tell what is "more." Since a low vs.

high level of distress is better suited to address our research question (Iacobucci et al., 2015), we dichotomized our distress measures into high (scores above the median) and low (scores below the median), following the methodology of Vanderbilt-Adriance and Shaw (2008a, 2008b). Parents who had scores below the median on both the parenting stress and role overload measures received a score of 0. All other parents received a score of 1 to indicate they experiences above average levels of distress (i.e., high) in this sample ($n = 122$, 59% for fathers; $n = 127$, 61% for mothers). A score of one on this variable indicates a high level of distress and a score of 0 indicates a low level of distress.

Protective Factors

Dyadic Synchrony To assess the quality of the parent-child relationship we used dyadic synchrony scores, which were coded from videotaped mother- and father-child interactions when children were 9 months old. Dyadic interactions were coded using the Qualitative Ratings for Parent-Child Interaction coding system (Cox & Crnic, 2003) and rated on a scale from 1 (not at all characteristic) to 5 (highly characteristic). The scales measure both the prevalence *and* the intensity of observed dyadic synchrony. Ratings on the scale are anchored by a brief description of the behaviors that merit that score. We used two dyadic synchrony variables in these analyses: mother dyadic synchrony and father dyadic synchrony scores.

Nurturant Parenting Nurturant parenting was coded from videotaped mother- and father-child interactions when children were 9 months old. Interactions were also coded using the Qualitative Ratings for Parent-Child Interaction coding system (Cox & Crnic, 2003) and rated on a scale from 1 (not at all characteristic) to 5 (highly characteristic) for both the prevalence and intensity of observed behavior. Mothers' and fathers' scores on parental responsiveness, positive affect, and animation were rated on the scale anchored by a brief description of the behaviors that merit that score and summed to create a mothers' nurturant parenting and a fathers' nurturant variable.

Parental Optimism Optimism was measured via the Positivity Scale (Caprara et al., 2012), which is a self-reported questionnaire where parents respond with the extent to which they agree with a series of eight statements about their optimism (e.g., "I have great faith in the future", "I am satisfied with my life"). This scale has satisfactory levels of reliability (.75; Caprara et al., 2012). Mothers' and fathers' optimism scores were used in these analyses.

Parents' Executive Functioning Parents' executive functioning was measured via direct assessment using the "Hearts & Flowers" task (Davidson et al., 2006; Diamond et al., 2007)

during the 9-month data collection wave. This task is used as a measure of attention shifting and inhibitory control. Parents were given a tablet and asked to follow the instructions on the screen. During this task, one of two target pictures (a heart or flower) appears on the left or right side of the tablet screen. Parents are asked to press one of two buttons on opposite sides of the tablet screen corresponding with the picture's location on the screen. When a heart appears, parents are instructed to press the button that corresponds to the same side of image presentation. When a flower appears, parents are asked to press the button on the opposite side of image presentation. This task has been found to be valid with ethnically and economically diverse samples of children and adults (Camerota et al., 2019; Ursache et al., 2015; Ursache & Raver, 2014). A previous work reports a test-retest ICC value of 0.79 (Edgin et al., 2010). For this study, we used the total number of accurate trials parents completed during the assessment administration.

Temperament Child temperament was measured with the Emotionality Activity Sociability (EAS) temperament scale (Buss, 1991; Buss & Plomin, 1984). Buss and Plomin proposed four dimensions of temperament: (1) emotionality—the tendency to become aroused easily and intensely—a global pattern of distress in the very young infant; (2) activity—preferred levels of activity and speed of action; (3) sociability—the tendency to prefer the presence of others to being alone; (4) shyness—the tendency to be inhibited and awkward in new social situations. We used maternal and paternal reports (i.e., mothers' reports in the mother models and fathers' reports in the father models) on this scale where they were asked to rate their children's behavior on a 5-point scale. Child easygoing temperament was created by summing the items from the sociability and activity scales and the shyness and emotionality subscales with the items reversed coded. Higher scores indicated higher levels of easygoing temperament.

Control Variables

We included three sets of control variables in our analyses: child gender, parents' education, and study condition. We controlled for child gender as previous research has demonstrated some differences in the ways mothers and fathers interact with their children. There are also gender differences in children's social skills and problem behaviors (Chaplin et al., 2010; DiPrete & Jennings, 2012). We also controlled for parental education because it is the strongest proxy of socioeconomic status that has been associated with children's development (Bornstein & Bradley, 2003). Although we are not investigating any effects of the intervention on our outcome, our data come from a randomized controlled trial; thus, we included experimental condition to control for any mean-level

differences in our variables of interest based on participants' random assignment to the experimental or control conditions.

Analysis and Results

We first present the descriptive statistics and bivariate correlations for the independent and dependent variables, followed by the results for each of the study's main hypotheses.

Descriptive Statistics and Bivariate Correlations

Descriptive statistics for all study variables appear in Table 1 and intercorrelations among protective factors appear in Tables 2 and 3. Maternal distress was negatively associated with children's social competence ($r = -.18, p < .01$) and positively associated with problem behaviors ($r = .27, p < .01$). Paternal distress was negatively associated with social competence ($r = -.32, p < .01$).

Direct Effects of Child and Family Factors

To examine the hypothesis that child and family factors assessed during infancy are directly associated with later child outcomes, we computed correlations for mothers and fathers, separately due to the interdependence of our data. We computed four multiple regression analyses (i.e., two mother models and two father models for each child outcome) to assess individual associations between child (i.e., temperament) and family characteristics (i.e., mothers' and fathers' nurturant parenting and dyadic synchrony, optimism, and executive function) at 9 months and children's social competence and problem behaviors at 21 months.

For mothers, optimism ($r = 0.21, p < 0.01$) was positively correlated with social competence and negatively correlated with problem behaviors ($r = -.21, p < .01$), but children's outcomes were not correlated with any other predictors for mothers. For fathers, there was a positive correlation between father-child dyadic synchrony and social competence ($r = .21, p < .05$), executive functioning and social competence ($r = .24, p < .01$), and optimism and social competence ($r = .19, p < .05$). Children's problem behaviors and father-child dyadic synchrony were correlated at trend level ($r = -.18, p < .10$); there were no other significant correlations for fathers.

Similar results were found using multiple linear regressions. A model was computed separately for mothers and fathers and for each child outcome (i.e., social competence and problem behaviors). We entered control (i.e., child gender, site, and parental education) and protective variables in the first step, followed by the dichotomous parent distress variable in the second step. For the mother models, the overall model was significant for social competence ($F_{(14, 106)} = 2.456, p < .01$; Table 4) and for problem behaviors ($F_{(14, 106)} = 2.198, p < .05$;

Table 2 Pearson correlations with variables of interest (mothers)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Child gender	1.00	-.06	.06	.14	.05	.03	-.03	-.11	.12	.15
2. Parent education		1.00	.07	.12	-.18*	.8	.01	.09	-.07	-.04
3. Nurturant parenting			1.00	.16	.04	.01	-.12	-.19*	-.03	.13
4. Dyadic synchrony				1.00	.05	.06	0.12	.08	-.17	.15
5. Parents' executive function					1.00	.05	-.12	-.12	.03	.13
6. Optimism						1.00	-.20**	.11	-.21**	.21**
7. Distress							1.00	-.09	.27**	-.18*
8. Easygoing temperament								1.00	-.11	.02
9. Problem behaviors									1.00	-.42**
10. Social competence										1.00

Note: As both child gender and distress are dichotomous variables, the correlations presented here represent point-biserial correlation coefficients

Table 5). We found a significant main effect of mother-child dyadic synchrony on problem behaviors ($\beta = -2.624, p < .01$). We also found a marginally significant and positive association between mothers' reports of distress and problem behaviors ($\beta = 1.984, p < .10$) and a negative and marginally significant association with social competence ($\beta = -0.819, p < .10$).

For the fathers, the overall model was significant for social competence ($F_{(14, 102)} = 2.005, p < .05$; Table 4) and marginally significant for problem behaviors ($F_{(14, 102)} = 1.767, p < .10$; Table 5). We found a marginally significant main effect of fathers' reports of optimism on children's social competence ($\beta = 1.46, p < .10$) and a marginally significant main effect of children's easygoing temperament on children's problem behaviors ($\beta = -0.793, p < .10$). Father distress was significantly related to children's problem behaviors ($\beta = 2.395, p < .05$).

Interactions Between Child and Family Factors and Parental Distress

To test the hypothesis that parental distress moderated the association between the protective factors and children's

social skills, five interaction terms (i.e., nurturant parenting x distress, parent-child dyadic synchrony x distress, executive functioning x distress, optimism x distress, positive temperament x distress) were included in the multiple regression in the third step. Independent variables in the interaction were centered prior to creating the interaction terms.

There were no significant interactions between mothers' protective factors and maternal distress on either child outcome (Tables 4 and 5). For fathers, there was a marginally significant interaction between fathers' optimism and paternal distress on children's social competence ($\beta = -1.905, p < .10$). We then conducted follow-up differences in simple slope analyses to determine at which level of distress the interaction was significant (Aiken & West, 1991). The analysis indicated that the positive association between paternal optimism and children's social competence was strengthened in the context of low paternal distress (Fig. 1). Thus, for children whose fathers report experiencing high levels of distress, increased paternal optimism did not protect them from its negative effect on child social competence.

Table 3 Pearson correlations with variables of interest (fathers)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Child gender	1.00	-.02	-.14*	.05	.08	.00	.04	-.15*	-.02	.17
2. Parent education		1.00	.08	.05	-.20**	-.10	.23**	.13	-.15	-.04
3. Nurturant parenting			1.00	.24**	.05	.04	.06	.11	.004	.005
4. Dyadic synchrony				1.00	.04	.005	-.15	.212*	-.18	.21*
5. Parents' executive function					1.00	.12	-.16*	-.01	-.04	.24**
6. Optimism						1.00	-.33**	.07	.12	.19*
7. Distress							1.00	-.06	.10	-.32**
8. Easygoing temperament								1.00	-.14	.15
9. Problem behaviors									1.00	-.29**
10. Social competence										1.00

Note: As both child gender and distress are dichotomous variables, the correlations presented here represent point-biserial correlation coefficients

Table 4 Summary of multiple regression analyses predicting child social competence from protective factors and distress

Measure	Mothers		Fathers	
	B	SE	B	SE
Control variables				
Child gender	1.014*	0.434	1.171*	-.447
Study condition	-0.088	0.187	0.034	0.179
Parents' education	-0.236	0.231	0.278	0.201
Protective factors				
Nurturant parenting	-0.125	0.586	0.171	0.528
Dyadic synchrony	0.089	0.377	0.668	0.463
Parents' executive function	1.599	3.022	1.948	2.065
Optimism	1.037	0.632	1.460 †	0.842
Easygoing temperament	0.013	0.144	0.167	0.158
Risk factors				
Parents' distress	-0.819 †	0.456	-0.513	0.461
Interactions				
Nurturant parenting X distress	0.413	0.703	-0.272	0.641
Dyadic synchrony X distress	0.580	0.492	-0.496	0.561
EF X distress	3.461	4.131	1.213	2.673
Optimism X distress	-0.579	0.830	-1.905 †	1.007
Temperament X distress	0.041	0.174	-0.052	.192

† $p < .10$, * $p < .05$, ** $p < .01$

Table 5 Summary of multiple regression analyses predicting child problem behaviors from protective factors and distress

Measure	Mothers		Fathers	
	B	SE	B	SE
Control variables				
Child gender	-0.819	1.130	-2.235 †	1.137
Study condition	-0.452	0.486	0.278	0.456
Parents' education	-0.291	0.600	-0.773	0.511
Protective factors				
Nurturant parenting	-1.022	1.525	-0.208	1.342
Dyadic synchrony	-2.624**	0.982	-0.428	1.178
Parents' executive function	2.196	7.862	-2.508	5.250
Optimism	-0.98	1.644	1.160	2.141
Easygoing temperament	-0.575	0.473	-0.793 †	0.402
Risk factors				
Parents' distress	1.984†	1.187	2.395*	1.171
Interactions				
Nurturant parenting X distress	2.705	1.829	0.399	1.631
Dyadic synchrony X distress	1.341	1.280	-0.624	1.425
EF X distress	-2.608	10.747	4.514	6.795
Optimism X distress	-0.183	2.158	1.836	2.561
Temperament X distress	0.487	0.453	0.868 †	0.488

† $p < .10$, * $p < .05$, ** $p < .01$

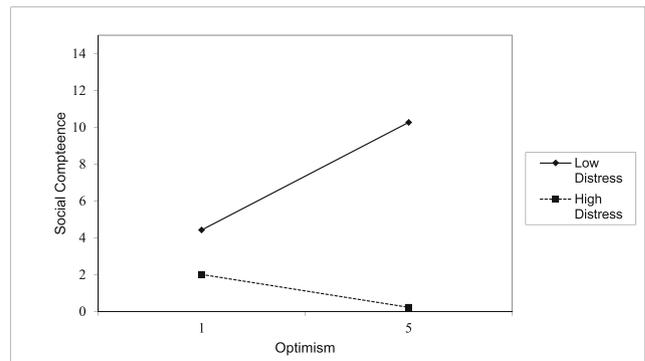


Fig. 1 Interaction between fathers' optimism and child social competence at levels of fathers' distress. Note: Low distress indicates a score of 0 on the distress measure and high distress indicates a score of 1 on the distress measure

Additionally, we found a marginally significant interaction between children's easygoing temperament and children's problem behaviors ($\beta = 0.868, p < .10$). Follow-up analyses indicated that the association between easygoing temperament and children's problem behaviors was strengthened also in the context of low paternal distress, but not high paternal distress (Fig. 2). For children whose fathers view them to be easygoing, fathers report them to have fewer problem behaviors only when fathers experienced lower levels of distress themselves.

Discussion

We investigated the associations among multiple child and family protective factors (i.e., mothers' and fathers' nurturant parenting, dyadic synchrony, optimism, executive function, and child temperament), paternal and maternal distress (i.e., parenting stress and role overload), and toddlers' social adaptation (i.e., social competence and behavior problems) in a sample of two-parent, economically and ethnically diverse, urban first-time mothers and fathers and their infants participating in an ongoing intervention from infancy to toddlerhood. We also examined whether the benefits of protective

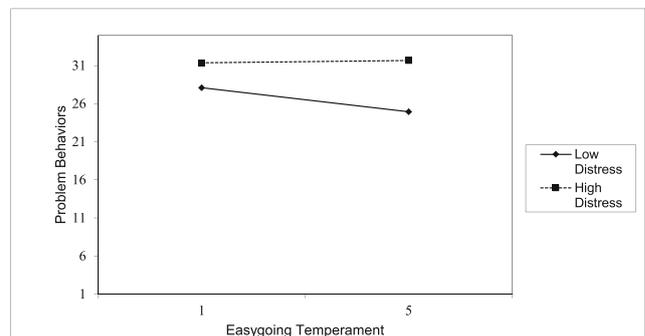


Fig. 2 Interaction between child easygoing temperament and problem behaviors at levels of fathers' distress. Note: Low distress indicates a score of 0 on the distress measure and high distress indicates a score of 1 on the distress measure

factors might vary by levels of parental risk (i.e., parental distress). Consistent with our hypothesis, we found that maternal dyadic synchrony and positive child temperament were associated with fewer behavior problems and paternal optimism with positive social adaptation in toddlers. That is, toddlers were rated by their parents as being more socially competent and having fewer behavior problems. When we examined interactions between individual protective factors and maternal and paternal levels of distress to test the moderating role of parental distress in the prediction of social adjustment, only paternal optimism and positive child temperament were found to interact with maternal and paternal distress. High levels of paternal optimism were marginally related to more social competence only when fathers reported low levels of distress (i.e., below the median in levels of parenting stress and role overload). Children rated by their parents as being easy-tempered were marginally rated as having fewer behavior problems than difficult-tempered children only when fathers reported low levels of distress.

Direct Associations Between Protective Factors and Children's Social Adaptation

Our findings that high levels of child and family protective factors during infancy were associated with positive social adaptation in toddlerhood are partially consistent with our hypotheses and with past findings on protective factors (Beeghly & Tronick, 2011; Collins, 2013; Dubowitz et al., 2016; Easterbrooks et al., 2008; Vanderbilt-Adriance & Shaw, 2008a).

Indeed, child-level and parenting variables are most consistently associated with positive outcomes for children. Mothers who are warm and sensitive may help children to regulate their feelings and behaviors by providing them with meaningful interpersonal resources (Harrist & Waugh, 2002). A new finding is that fathers are also significant promoters of child well-being, which corroborates the burgeoning literature that fathers' contributions to their children are different and independent from mothers' (Cabrera et al., 2007). Studies have shown that children who are easygoing are more likely to adapt and cope with challenging situations (Wang & Deater-Deckard, 2013). Similarly, mothers who have a positive, reciprocal, and warm relationship with their children may help them deal with adversity by fostering coping skills and providing them with positive interpersonal resources. In a comparable way, fathers' optimism may enhance their own psychological and physical health in ways that make it easier for them to deal with challenging situations and at the same time model positive coping skills to children.

Moderating Role of Maternal and Paternal Levels of Distress

The only protective factors that significantly interacted with paternal distress to predict social adjustment were father

optimism and children's positive temperament. High levels of paternal optimism were only associated with positive outcomes (better social adaptation) when they had low levels of distress. Children's easygoing temperament was associated with positive outcomes (fewer behavior problems) when fathers reported low levels of distress. Unexpectedly, maternal and paternal distress did not moderate the association between mother-child dyadic synchrony assessed during infancy and positive social adaptation in toddlerhood. Our findings suggest that this latter protective factor works similarly across levels of maternal distress.

Our findings contribute to the literature in at least two ways. First, we found partial support for the view that selected child and family protective factors are more significant in contexts of low vs. high level of risk for parents. Of the five protective factors (i.e., mothers' and fathers' nurturant parenting and dyadic synchrony, optimism, and executive function) we explored in this study, only three (i.e., maternal dyadic synchrony, father optimism, and child positive temperament) were associated with positive social adjustment regardless of the level of risk (i.e., distress) of their mothers and fathers. That these protective factors are operating lower levels of paternal risk is consistent with our hypotheses. However, the fact that these factors were not strongly associated with social adaptation at higher levels of risk is not what we expected. Our sample consists of families with relative high levels of education (approximately a third of our families have a college degree) and low levels of distress and thus could be considered low-risk. Thus, "high levels of risk" in our sample is not comparable to "high risk" in past studies that have included families with multiple risk factors (e.g., Easterbrooks et al., 2008; Vanderbilt-Adriance & Shaw, 2008a). Given the low-risk nature of our sample, it is puzzling that these protective factors were not operating at high levels of risk by the standards of our sample.

Second, the finding that high levels of optimism and positive temperament were associated with positive social adjustment at low levels of risk suggests the possibility of a ceiling effect. High levels of paternal optimism were not associated with positive adaptation at high levels of distress for either parent. For children living with one or two parents with high levels of distress, parental optimism might be less important than other stressors in their daily lives that could directly affect their well-being. Also, parental optimism may not be as important for infants' well-being relative to other stressors and, moreover, it may be a more distal factor and not affect in any palpable way children's home environment. Thus, it may be less likely to offset risk compared to more proximal threats such as maternal or paternal mental health. A very optimistic father may be a good role model for his child, but this may not be enough to counter multiple risks that would be more proximal and damaging to the child. There is a dearth of information on how parental optimism matters for children and whether it is moderated by levels of environmental risk.

Limitations

It is important to note several limitations of this study. First, families were recruited from two geographical regions and findings may not apply to families in other locations. Second, we focused solely on first-time, co-habiting parents and these findings may not generalize to parents with more than one child, separate households, or additional caregivers (e.g., step-parents/new partners). Third, though the BITSEA is a validation measure, it is reliant on parent report, rather than direct observations, of child behaviors.

Conclusion

Research frequently focuses on the risks that threaten children's positive development. Focusing on the first 2 years, this study explores the child- and family-level factors that contribute to resilience during infancy. We find that maternal dyadic synchrony promotes social adaptation regardless of maternal distress and that children who are easygoing are more likely to be perceived by their fathers as being socially competent but only when fathers have low levels of distress. Importantly, we explored these patterns in a sample of economically and ethnically diverse urban families. It is important to note that protective factors and risks associated with children's social adaptation are different for mothers and fathers, underscoring the importance of including both parents and recognizing their different and unique contributions to development. These findings emphasize the importance of including both parents to examine both promotive factors (main effects) as well as protective factors (interaction effects) that can be used to design interventions that are more targeted to the needs of families. These findings suggest that prevention programs should focus on helping low-risk mothers and fathers engage in positive reciprocal interactions with their children and support fathers' mental health for promoting social adaptation in their children.

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