

Parental Stress and Children’s Social and Behavioral Outcomes: The Role of Abuse Potential over Time

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Abstract Parental stress is a well-established risk factor for adverse child outcomes, including the development of aggression, externalizing behavior problems, and anxiety, as well as compromised emotional coping, impaired social cognition, and diminished treatment response. Abuse potential represents a mechanism by which parental stress may impact child social competence and behavior; evidence links parental stress to abuse potential, and abuse potential to a range of negative child social competence and behavioral outcomes. The current study assessed relationships between parental stress, abuse potential, and child social and behavioral outcomes over time. Parents of children ages 2–6 years ($N = 610$, 44% girls) reported on perceived parental stress and attitudes towards abuse and neglect, as well as child social competence and behavior problems, before and after a caregiver-directed, community-based intervention. Changes in parental stress, abuse potential, and child social and behavioral outcomes were examined using panel analyses, while controlling for intervention effects and demographic variables. Parental stress predicted child social competence, anxiety/withdrawal, and anger/aggression over time; while the links between stress and anxiety/withdrawal, and stress and social competence, were mediated by child abuse potential, the link between stress and anger/

aggression was not mediated by child abuse potential. Findings suggest that abuse potential represents a mechanism by which parental stress and child social and behavioral outcomes are linked. Further, screening for child social competence deficits may identify children at risk for abuse, as well as parents in need of services to reduce stress.

Keywords Parental stress · Child abuse potential · Child social competence · Childhood aggression · Child anxiety

Decades of research have documented the significant and complex role of parental psychological well-being in the development of child mental health problems (e.g., Biederman et al. 1995; Birmaher et al. 2009; Gopalan et al. 2011; Weissman et al. 1996). Within the scope of parental health, parental stress is a well-established risk factor for adverse child outcomes, including the development of aggression and disruptive behavior (Baker et al. 2000; Podolski and Nigg 2001; Theule et al. 2010), internalizing problems/anxiety (Costa et al. 2006; Mäntymaa et al. 2011), compromised emotional coping (Cappa et al. 2011), and impaired social cognition and competence (Guajardo et al. 2009; Gutermuth Anthony et al. 2005). Importantly, literature also links parental stress to greater child abuse potential (Nair et al. 2003; Rodriguez 2010a; Rodriguez and Green 1997; Rodriguez and Richardson 2007), a risk-related construct strongly associated with actual caregiver engagement in abusive behavior (Chaffin and Valle 2003; Milner et al. 1984; Milner et al. 1986) as well as observed harsh parenting style (Haskett et al. 1995), and correlated with parent reports of using physical assault and psychological aggression to resolve parent–child conflicts (Rodriguez 2010a). Based on the public health burden of these negative outcomes (Briggs-Gowan et al. 2001; Carter et al.

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2010; Costello et al. 2003; Reef et al. 2009), and the lasting implications of child abuse (Copeland et al. 2007; Dodge et al. 1997; Duke et al. 2010; Ruchkin et al. 2007), improving our understanding of the relationships between parental stress, abuse potential, and child socioemotional and behavioral functioning is imperative.

Abuse potential represents one possible mechanism by which parental stress impacts a variety of child outcomes. Strong evidence links parental stress to risk for, and engagement in, child abuse (Chan 1994; Taylor et al. 2009; Whipple and Webster-Stratton 1991), and abuse to lasting behavioral, social, and emotional impairments in children (e.g., Copeland et al. 2007; Duke et al. 2010; Ruchkin et al. 2007). Research also suggests that higher parental stress levels are related to greater child abuse potential (e.g., Crouch and Behl 2001; Rodriguez 2010b; Nair et al. 2003; Rodriguez and Richardson 2007). Parental stress is thought to affect child outcomes predominantly by impacting parenting behavior and altering parent–child interactions (Deater-Deckard 1998), thus increasing the risk for maltreatment. Perhaps stress compromises parental empathy—the capacity to understand and share in another’s emotional state—in a manner similar to personal distress, which has been negatively linked to adult prosocial behavior (Eisenberg et al. 2010). Indeed, stress compromises empathy in adults (Buruck et al. 2014), and low parental empathy is linked to child abuse potential (McElroy and Rodriguez 2008; Rodriguez 2013; Rodriguez and Richardson 2007). Stress also modulates abuse potential in parents with existing social-cognitive and contextual risk factors, such as avoidant coping strategies (Rodriguez 2010b) and belief in the value of physical punishment (Crouch and Behl 2001), with greater stress linked to greater abuse potential at higher levels of these risk factors.

In turn, abuse potential is associated with a range of child outcomes as reported by parents, children, and teachers. With regard to youth internalizing symptoms, studies show that abuse potential is related to higher child-reported anxious and depressive symptoms (Rodriguez 2003), higher parent-reported child depressive symptoms (Kolko et al. 1993), as well as parent-rated child post-traumatic stress and trauma-related anxiety (Costello et al. 2014). With regard to youth externalizing symptoms, studies show that abuse potential is related to greater parent-reported child aggression and oppositionality (Costello et al. 2014) and disruptive/externalizing behavior problems (Kolko et al. 1993; Moreland Begle et al. 2010). More generally, greater abuse potential is related to compromised parent-reported youth coping competence (Lopez et al. 2011) and fewer parent-reported child adaptive behaviors (Dukewich et al. 1999). While the relationship between abuse potential specifically and social competence

has not been examined, experiencing child abuse is linked to teacher- and therapist-rated social skill deficits (Darwish et al. 2001), child reports of social information processing factors (Dodge et al. 1995), and later self-report of difficulties experiencing appropriate emotional and cognitive aspects of empathy in adulthood (Locher et al. 2014). Given the strong link between abuse potential and actual caregiver engagement in abusive behavior towards children (e.g., Chaffin and Valle 2003), as well as the importance of intervening to change these caregiver attitudes *before* they escalate into abuse, further research focusing on relationships between abuse potential and varied outcomes is essential.

In addition to the unidirectional impact of parental stress on child outcomes, a transactional relationship between these constructs has been proposed (Hastings 2002). Adverse child outcomes—such as externalizing behavior problems—may contribute further to parental stress (Donenberg and Baker 1993), and thus strengthen relationships between parental stress, child abuse, and child social and behavioral difficulties. Indeed, child problem behaviors covary with parental stress over time (Neece et al. 2012). In longitudinal comparisons between typically developing and developmentally delayed children, problem behaviors (Baker et al. 2003) and social skill deficits (Neece and Baker 2008) have emerged as stronger predictors of parental stress than delays. Bidirectional relationships have also emerged between parental stress and child social coping competence (Cappa et al. 2011). Among child problem behaviors, research has shown that both internalizing and externalizing symptoms (Walker and Cheng 2007) are longitudinally related to parental stress. Externalizing behaviors and aggression in particular have been associated with parental stress over time (Donenberg and Baker 1993; Krahé et al. 2015), and parents of children with behavior disorders experience greater stress levels than parents of typically developing children (Dumas et al. 1991). However, to our knowledge, limited literature has examined transactional relationships between parental stress and child social functioning (Cappa et al. 2011; Neece and Baker 2008), and extant literature examining bidirectional relationships between stress and child problem behaviors often groups internalizing and externalizing problem behaviors together (e.g., Baker et al. 2003; Neece et al. 2012). Although parental stress has been linked with child internalizing problems over time (Mäntymaa et al. 2011), transactional relationships between these constructs have not been assessed. More research is needed to examine the potential bidirectional associations between parental stress and specific child outcomes, and to clarify the function of child abuse potential in these relationships.

Among the existing literature examining relationships between parental stress, parenting, and child outcomes are cross-sectional studies that have yielded unclear conclusions regarding the specific role of abuse potential—representing a gap that may be filled by examining parenting attitudes and child social, emotional, and behavioral functioning with greater specificity. Gutermuth Anthony et al. (2005) linked higher parental stress to lower classroom social competence, and increased teacher-rated internalizing and externalizing problems among preschoolers; however, the link between parental stress and negative social and behavioral outcomes was not mediated by caregiver reports of parenting behavior (parental discipline practices, nurturing, and expectations). Huth-Bocks and Hughes (2008) found that greater parental stress was directly associated with increased child-rated internalizing and parent-rated externalizing problems, but caregiver reports of ineffective parenting did not mediate this link. Only one of these studies (Gutermuth Anthony et al. 2005) differentiated between internalizing, externalizing, and social competence-related child difficulties; neither examined the unique contribution of child abuse potential specifically, or examined relationships between parental stress, child abuse potential, and child outcomes over time. Thus far, existing studies have not evaluated differential effects between varied child outcomes in the context of these parenting factors. Research examining the extent to which abuse potential contributes to the relationship between parental stress and varied child outcomes is central to prevention efforts, and is sorely needed—particularly research examining the potential for bidirectional, longitudinal relationships between these constructs.

The present study evaluated relationships between parental stress, child abuse potential, and child social and behavioral outcomes over time. Given evidence linking parental stress to adverse child outcomes (Baker et al. 2000; Mäntymaa et al. 2011; Guajardo et al. 2009), we hypothesized that parental stress would be positively associated with child anger/aggression and anxiety/withdrawal, and negatively associated with child social competence, across study time points. In light of research linking child externalizing problems to increased parental stress (Krahé et al. 2015), we hypothesized a bidirectional relationship between child anger/aggression and parental stress, such that Time 1 child anger/aggression would be positively associated with Time 2 parental stress. We also hypothesized that in support of Deater-Deckard's (1998) theory that parenting behavior mediates the relationship between parental stress and child behavioral and emotional difficulties, child abuse potential would mediate the relationships between parental stress and child outcomes, given the well-supported connection between abuse potential and both parental stress (e.g., Nair et al. 2003; Rodriguez and Richardson 2007) and child well-being (e.g., Baker et al. 2000; Costa et al. 2006; Guajardo et al. 2009).

Method

Participants

The present study used data collected as part of the Parenting Our Children to Excellence (PACE) program, a preventive intervention project designed to foster positive parent–child relationships and thereby increase the likelihood of positive outcomes among socioeconomically disadvantaged families of preschool children. In the study sample, mean yearly income (26,459) was well below the median income in Indianapolis at the time of the study (40,421); approximately 1 in 2 families qualified for subsidized childcare, and 54% of parents were single. The majority (64.8%) of study parents completed some college. Approximately 46% of participating caregivers were African American mothers, 42% were Caucasian mothers, 4% were Caucasian fathers, 3% were African American fathers, and 5% reported their ethnicity as Other. With regard to child participants, 31% were African American boys, 25% were African American girls, 23% were Caucasian boys, and 19% were Caucasian girls.

Procedure

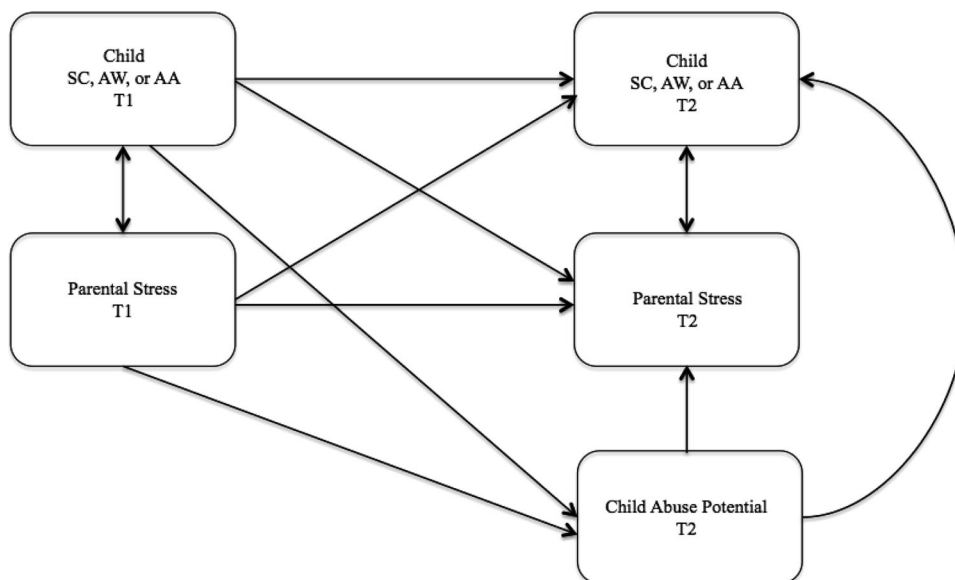
Prior to implementation of the PACE program, all study proceedings were approved by the Purdue University Institutional Review Board. The PACE program (Begle and Dumas 2011; Dumas et al. 1999) consisted of an 8-week behavioral parenting program for caregivers of children age 3–6. Given that greater participation in PACE has been associated with improved child and parent outcomes (Begle and Dumas 2011), the present analyses controlled for the number of PACE sessions attended ($M = 4.32$, $SD = 3.12$). In the context of the larger intervention, caregivers ($N_{pre} = 610$, $N_{post} = 519$; $M_{caregiver\ age} = 31.05$, $SD_{caregiver\ age} = 7.13$) of children ages 3–6 years ($M_{child\ age} = 4.41$, $SD_{child\ age} = .78$) reported on perceived parental stress and child abuse potential, as well as child behavioral and social competence, before (Time 1; T1) and after the intervention (Time 2; T2).

Measures

Children's social and behavioral outcomes

Children's social competence and behavior problems were measured via caregiver-report using the *Social Competence and Behavior Evaluation (SCBE)* (LaFreniere and Dumas 1996), a 30-item measure, with individual items ranging from 1 ("Almost never occurs") to 6 ("Almost always occurs"). Evidence has supported 3 factors, including social competence (SC), anger-aggression (AA), and anxiety-withdrawal (AW), as well as strong psychometric properties

Fig. 1 General path analysis model *Note: Child SC social competence, AW anxious/withdrawal, AA anger/aggression. Separate path analysis models were run for each of these constructs. Intervention effects and demographic variables were included as covariates. Single-headed arrows are used to depict an indirect effect by abuse potential on parental stress and child outcomes*



(LaFreniere and Dumas 1996). Higher SC scores indicate higher social competence, while higher AA and AW scores indicate greater aggression- and anxiety-related behavior problems, respectively. In the present sample, internal consistency was strong for the AA ($\alpha = .85$) and SC ($\alpha = .82$) subscales, and acceptable for the AW ($\alpha = .74$) subscale.

Child abuse potential

Child abuse risk was measured using the *Child Abuse Potential Inventory (CAPI; Milner 1986; 2006)*. Caregivers rated whether they agreed or disagreed (forced-choice) with 160 statements designed to reflect likelihood of abuse. The Abuse Scale, consisting of 77 variably-weighted items measuring child physical abuse, was used in the present study. Higher scores indicated greater likelihood of maltreatment. The CAPI is a widely used, well-supported measure of child abuse potential (Chaffin and Valle 2003; Medora et al. 2001; Milner 1994). Internal consistency for the abuse scale was acceptable in the present sample ($\alpha = .71$). Time 2 CAPI scores were used to measure child abuse potential in the present analytical model.

Parental stress

Parental stress was measured via caregiver self-report using the *Parenting Stress Index/Short Form (PSI/SF; Abidin 1995)*, a 36-item, 5-point Likert scale ranging from 1 (“Strongly agree”) to 5 (“Strongly disagree”). Scores were summed to calculate a Total Stress subscale score; higher scores indicate higher stress. The PSI is a well-established measure of parental stress; the reliability, validity, and

factor structure have been evaluated in a variety of populations (Bigras et al. 1996; Haskett et al. 2006; Whiteside-Mansell et al. 2007). Internal consistency for the Total Stress subscale was strong ($\alpha = .91$) in the present sample.

Data Analysis

Bidirectional longitudinal change in parental stress, child abuse potential, and child outcomes was examined using panel analysis. Attendance in the intervention (PACE) was entered as a control variable along with demographic variables, including caregiver education and child ethnicity, age, and gender. Structural Equation Modeling (SEM) techniques were used to conduct panel analyses in Mplus version 7.0 (Muthén and Muthén 2012), as shown in Fig. 1. Data were missing completely at random (MCAR)—that is, no significant differences were found between parents with and without missing data on any study variables. Missing data were handled using Full Information Maximum Likelihood estimation (FIML; Graham et al. 2007).

The proposed path model evaluated whether T1 parental stress predicted T2 child social and behavioral outcomes, as well as whether T1 child social and behavioral functioning predicted T2 parental stress. To examine the potential mediational role of child abuse potential in these relationships, T2 abuse potential was modeled as a predictor of T2 parental stress and child outcomes. Model fit was evaluated using the following recommendations: non-significant model chi-square statistic (Kline 2005); Comparative Fit Index (CFI) $\geq .95$ (Hu and Bentler 1999); and Root Mean Square Error of Approximation (RMSEA) $\leq .06$ (Hu and Bentler 1999). Separate models were run for each child outcome. For proposed mediation effects, 95% bias-

Table 1 Descriptive statistics

	Time 1			Time 2		
	Mean	SD	Min-max	Mean	SD	Min-max
Social competence	4.04	.76	2.30–5.90	4.17	.73	1.20–6.00
Anxiety/withdrawal	1.97	.58	1.00–4.40	1.95	.53	1.00–4.10
Anger/aggression	2.42	.74	1.00–5.60	2.31	.63	1.00–4.80
Abuse potential	110.78	84.37	3.00–424.00	98.17	79.23	2.00–394.00
Parental stress	85.64	21.52	41.00–169.00	82.18	20.23	39.00–165.00

corrected confidence intervals (BCCIs) for effect sizes are provided. Given the potential differences in relationships between constructs of interest in mothers vs. fathers (Cabrera and Mitchell 2009; Perez-Albeniz and de Paul 2004; Schaeffer et al. 2005), and that fathers comprised 7% of the study sample, parallel analytical models were run with the original sample—including mothers and fathers—and a subsample of only mothers. Similar results in model fit indices and effect sizes were observed in both analytical models. All significant relationships observed in the original sample remained significant in the mothers-only subsample. Results from the original sample are presented.

Results

Table 1 presents descriptive statistics for study variables, and Table 2 presents zero-order correlations for study variables. Using the conservative cutoff developed by Milner (1986; 2006), roughly 18.8% of caregivers obtained a CAPI abuse subscale score greater than 166; scores above 166 predict clinically elevated abuse risk. Children's social competence was negatively correlated with anxiety/withdrawal and anger/aggression, parental stress, and abuse potential at both time points. Child anxiety/withdrawal and anger/aggression were positively correlated at T1 and T2. Parental stress was positively correlated with child anxiety/withdrawal and anger/aggression, as well as abuse potential, at both time points.

A structural equation model was used to examine the relationships between parental stress, abuse potential, and child social competence at T1 and T2. Though the model chi square was significant ($\chi^2(5) = 29.93$, $p < .001$), a caveat in using chi square is its sensitivity to large sample size (Kline 2005). Other indices suggested adequate model fit (CFI = .98, RMSEA = .09). Table 3 presents the path coefficients for the social competence model. Covariates were not significantly related to study variables of interest, with the exception of a significant relationship between T2 abuse potential and child ethnicity ($B = -.088$, $\beta = -10.742$, $p = .021$), as well as caregiver education ($B = -.295$, $\beta = -20.346$, $p < .001$). Parental stress and child

social competence were significantly negatively associated at T1 ($B = -.397$, $\beta = -.014$) and T2 ($B = -.348$, $\beta = -2.355$), $ps < .001$. While T1 parental stress did not predict T2 competence ($B = -.052$, $\beta = -.002$, $p = .186$), T1 competence predicted T2 parental stress ($B = -.105$, $\beta = -2.818$, $p = .001$). T2 abuse potential was significantly related to parental stress at T1 ($B = .468$, $\beta = 1.720$) and T2 ($B = .304$, $\beta = .078$), $ps < .001$, as well as competence at T2 ($B = -.092$, $\beta = -.001$, $p = .018$), but was not related to competence at T1 ($B = .073$, $\beta = 7.555$, $p = .077$). Abuse potential mediated the link between T1 parental stress and T2 child social competence ($B = -.043$, $\beta = -.001$, $p = .021$, 95% BCCI = $-.082$ – $-.004$), but did not mediate the link between T1 competence and T2 stress ($B = .022$, $\beta = .590$, $p = .083$, 95% BCCI = $-.007$ – $.051$).

A structural equation model was used to examine the relationships between parental stress, abuse potential, and child anxiety/withdrawal at T1 and T2. The model chi square was significant ($\chi^2(5) = 37.79$, $p < .001$); other indices suggested modest model fit (CFI = .97, RMSEA = .10). Table 4 presents the path coefficients for the anxiety/withdrawal model. Covariates were not significantly related to study variables of interest, with the exception of a significant relationship between child ethnicity and T2 anxiety/withdrawal ($B = .106$, $\beta = .087$, $p = .002$), and significant relationships between T2 abuse potential and child ethnicity ($B = -.095$, $\beta = -11.586$, $p = .014$), as well as caregiver education ($B = -.293$, $\beta = -20.249$, $p < .001$). Parental stress and child anxiety/withdrawal were significantly associated at T1 ($B = .276$, $\beta = .007$) and T2 ($B = .245$, $\beta = 1.208$), $ps < .001$. While T1 parental stress predicted T2 anxiety/withdrawal ($B = .082$, $\beta = .002$, $p = .032$), T1 anxiety/withdrawal did not significantly predict T2 parental stress ($B = .052$, $\beta = 1.821$, $p = .086$). T2 abuse potential was significantly related to parental stress at T1 ($B = .431$, $\beta = 1.584$) and T2 ($B = .293$, $\beta = .075$), as well as anxiety/withdrawal at T2 ($B = .144$, $\beta = .001$), $ps < .001$, but not anxiety/withdrawal at T1 ($B = .040$, $\beta = 5.385$, $p = .304$). Abuse potential mediated the link between T1 parental stress and T2 anxiety/withdrawal ($B = .062$, $\beta = .002$, $p < .001$, 95% BCCI = $.022$ – $.102$), but did not mediate the link between T1 anxiety/withdrawal and T2

Table 2 Zero-order correlations

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Age	1												
2. Gen.	.06	1											
3. Ethn.	-.003	.08	1										
4. Educ.	-.02	-.02	.25**	1									
5. PACE	.001	.03	.21**	.24**	1								
6. T1 SC	.19**	-.10*	-.03	.12**	.13**	1							
7. T1 AW	.04	.19**	.12**	.12**	.13**	-.15**	1						
8. T1 AA	-.05	.10*	.06	-.03	.01	-.31**	.29**	1					
9. T1 PSI	-.06	.09**	-.02	-.15**	.08	-.40**	.28**	.44**	1				
10. T2 SC	.13**	-.14**	.02	.19**	-.002	.68**	-.13**	-.24**	-.36**	1			
11. T2 AW	-.04	.01	.19**	.06	.06	-.17**	.67**	.26**	.30**	-.22**	1		
12. T2 AA	-.09*	.07	.07	-.05	-.04	-.25**	.21**	.70**	.39**	-.29**	.36**	1	
13. T2 PSI	-.01	.08	-.02	-.19**	.07	-.35**	.25**	.32**	.72**	-.48**	.39**	.39**	1
14. T2 CAPI	-.002	.06	-.17**	-.39**	.01	-.15**	.12**	.21**	.50**	-.24**	.22**	.24**	.57**

Partial correlations are presented between Time 2 measures and all variables (except PACE), controlling for PACE session attendance

Age child age, Gen. child gender, Ethn. child ethnicity, Educ. caregiver education, PACE number of PACE sessions attended, T1 Time 1, T2 Time 2, SC social competence, AW anxiety/withdrawal, AA anger/aggression, CAPI child abuse potential, PSI parental stress

* $p < .05$; ** $p < .01$

Table 3 Path coefficients for the social competence structural equation model

	β	b	SE	p
Social competence T2				
Social competence T1	.624	.646	.035	<.001
Parental stress T1	-.002	-.052	.001	.186
Child abuse potential T2	-.001	-.092	<.001	.018
Attendance	-.005	-.020	.008	.556
Child age	.006	.006	.030	.839
Child ethnicity	-.005	-.004	.038	.896
Child gender	-.052	-.035	.047	.271
Caregiver education	.035	.055	.023	.124
Parental stress T2				
Social competence T1	-2.818	-.105	.867	.001
Parental stress T1	.511	.542	.033	<.001
Child abuse potential T2	.078	.304	.009	<.001
Attendance	.052	.008	.199	.793
Child age	1.175	.045	.742	.113
Child ethnicity	.1378	.044	.941	.143
Child gender	-.552	-.014	1.165	.636
Caregiver education	.739	.042	.564	.190
Child abuse potential T2				
Social competence T1	7.555	.073	4.274	.077
Parental stress T1	1.720	.468	.146	<.001
Attendance	.904	.036	.987	.360
Child age	.874	.009	3.671	.812
Child ethnicity	-10.742	-.088	4.647	.021
Child gender	2.564	.016	5.780	.657
Caregiver education	-20.346	-.295	2.650	<.001

parental stress ($B = .012$, $\beta = .404$, $p = .307$, 95% BCCI = $-.014$ – $.037$).

A structural equation model was used to examine the relationships between parental stress, abuse potential, and child anger/aggression at T1 and T2. All indices suggested good model fit ($\chi^2(5) = 8.86$, $p = .11$; CFI = .99, RMSEA = .04). Table 5 presents the path coefficients for the Anger/Aggression model. Covariates were not significantly related to study variables of interest, with the exception of a significant relationship between child age and T2 anger/aggression ($B = -.060$, $\beta = -.049$, $p = .046$), and significant relationships between T2 abuse potential and child ethnicity ($B = -.091$, $\beta = -11.102$, $p = .017$), as well as caregiver education ($B = -.291$, $\beta = -20.058$, $p < .001$). Parental stress and child aggression were significantly associated at T1 ($B = .441$, $\beta = .015$) and T2 ($B = .193$, $\beta = 1.128$), $ps < .001$. While T1 parental stress predicted T2 aggression ($B = .091$, $\beta = .003$, $p = .017$), T1 aggression did not predict T2 parental stress ($B = .011$, $\beta = .301$, $p = .734$). T2 abuse potential was significantly related to

Table 4 Path coefficients for the anxiety/withdrawal structural equation model

	β	b	SE	<i>p</i>
Anxiety/withdrawal T2				
Anxiety/withdrawal T1	.568	.625	.031	<.001
Parental stress T1	.002	.082	.001	.032
Child abuse potential T2	.001	.144	<.001	<.001
Attendance	−.006	−.036	.006	.294
Child age	−.023	−.034	.021	.271
Child ethnicity	.087	.106	.028	.002
Child gender	−.030	−.028	.034	.379
Caregiver education	.025	.055	.017	.124
Parental stress T2				
Anxiety/withdrawal T1	1.821	.052	1.060	.086
Parental stress T1	.536	.569	.032	<.001
Child abuse potential T2	.075	.293	.009	<.001
Attendance	.024	.004	.200	.904
Child age	.644	.025	.732	.380
Child ethnicity	1.160	.037	.961	.227
Child gender	−.007	<.001	1.163	.995
Caregiver education	.445	.025	.568	.434
Child abuse potential T2				
Anxiety/withdrawal T1	5.385	.040	5.236	.304
Parental stress T1	1.584	.431	.142	<.001
Attendance	.949	.037	.987	.337
Child age	2.020	.020	3.605	.575
Child ethnicity	−11.586	−.095	4.712	.014
Child gender	1.373	.009	5.742	.811
Caregiver education	−20.249	−.293	2.656	<.001

parental stress at T1 ($B = .430, \beta = 1.581$) and 2 ($B = .295, \beta = .076$), $ps < .001$, but not aggression at T1 ($B = .031, \beta = 3.355, p = .441$) and T2 ($B = .060, \beta < .001, p = .106$). Abuse potential did not mediate the link between T1 parental stress and T2 aggression ($B = .026, \beta = .001, p = .110, 95\% \text{ BCCI} = -.008-.060$), or the link between T1 child aggression and T2 parental stress ($B = .009, \beta = .254, p = .443, 95\% \text{ BCCI} = -.021-.039$).

Discussion

The current study examined the complex relationships between parental stress, child abuse potential, and child social and behavioral competence over time, and thus, filled a gap in the existing literature by assessing a variety of longitudinal, bidirectional outcomes. Overall, parental stress was consistently linked to abuse potential across both time points in all three models, supporting the relationship noted

Table 5 Path coefficients for the anger/aggression structural equation model

	β	b	SE	<i>P</i>
Anger/aggression T2				
Anger/aggression T1	.571	.658	.030	<.001
Parental stress T1	.003	.091	.001	.017
Child abuse potential T2	<.001	.060	<.001	.106
Attendance	−.012	−.057	.007	.086
Child age	−.049	−.060	.025	.046
Child ethnicity	.043	.044	.032	.176
Child gender	−.041	−.032	.039	.294
Caregiver education	−.001	−.002	.019	.956
Parental stress T2				
Anger/aggression T1	.301	.011	.884	.734
Parental stress T1	.545	.579	.034	<.001
Child abuse potential T2	.076	.295	.009	<.001
Attendance	.031	.005	.201	.877
Child age	.691	.027	.734	.346
Child ethnicity	1.412	.045	.953	.138
Child gender	−.083	−.002	1.171	.943
Caregiver education	.541	.031	.567	.340
Child abuse potential T2				
Anger/aggression T1	3.355	.031	4.355	.441
Parental stress T1	1.581	.430	.149	<.001
Attendance	1.021	.040	.990	.303
Child age	2.167	.021	3.605	.548
Child ethnicity	−11.102	−.091	4.665	.017
Child gender	.798	.005	5.773	.890
Caregiver education	−20.058	−.291	2.649	<.001

between these constructs in previous research (e.g., Nair et al. 2003; Rodriguez and Richardson 2007), and reiterating the critical need to target parental stress as a means to reduce child abuse risk. Other relationships between study variables varied by construct, highlighting the nuanced nature of these associations.

Specifically, lower child social competence predicted higher parental stress levels over the study time period. This finding is consistent with research associating greater parental stress levels with lower child social competence (Gutermuth Anthony et al. 2005) and theory of mind—an aspect of social cognition—capabilities (Guajardo et al. 2009), as well as literature indicating that social skill deficits emerge as unique predictors of parental stress over time (Neece and Baker 2008). Study findings supply additional evidence that child social skills in particular are important to positive parent–child relationship development, and may serve as a valuable target to decrease parental stress.

Contrary to our expectations, parental stress did not directly predict child social competence over the study

period; however, when potential indirect effects were considered, abuse potential mediated the relationship between parental stress and child social competence over time. One potential explanation for these findings could be the length of the assessment period. Specifically, 8 weeks may not have been enough time for child social competence to impact parental stress alone, although the presence of abuse potential may explain the relationship. Greater abuse potential was also associated with lower child social competence at T2, providing further evidence for the established link between impaired social competence among youth exposed to child abuse (Darwish et al. 2001; Dodge et al. 1997), and suggesting that abuse potential represents a useful tool to investigate the relationships between parent stress and child outcomes further—before parental risk for child abuse leads to actual engagement in abusive behaviors. Experiencing abuse may compromise aspects of children's social-cognitive development, hampering the ability to correctly identify, interpret, and respond to others' emotions (Locher et al. 2014), and thus altering the way children interact with others (Dodge et al. 1997). Our findings suggest that, in its role as a risk-related construct rather than a measurement of abusive behavior, child abuse potential represents a path by which parental stress increases risk for negative child social outcomes. In light of parents' important role in child socialization processes (e.g., Denham et al. 1997; Denham et al. 2000; Zhou et al. 2002), stress-related changes in the parent–child relationship associated with greater abuse potential (Deater-Deckard 1998; Rodriguez and Richardson 2007) may increase children's risk for impaired social-cognitive development, and explain the mediating role of child abuse potential observed in the present study.

With regard to anxiety/withdrawal, greater parental stress significantly predicted higher child anxiety over time, in line with existing research linking parental stress to child internalizing problems both concurrently and longitudinally (e.g., Costa et al. 2006; Mäntymaa et al. 2011). In contrast to previous literature suggesting that ineffective parenting did not mediate the link between parental stress and child internalizing behaviors (Huth-Bocks and Hughes 2008), we found that child abuse potential mediated the link between parental stress and anxiety over time. However, our method built on the Huth-Bocks and Hughes (2008) study by differentiating between abuse potential and ineffective parenting behaviors, such as inconsistent discipline, perhaps increasing our ability to detect effects specific to the abuse potential construct. Our findings suggest that abuse potential—which has been linked with parental stress in previous literature (e.g., Rodriguez and Richardson 2007)—represents a mechanism by which parental stress associates with child anxiety over time. In the present study, the child anxiety/withdrawal construct may reflect anxiety children

experience as a result of parent-displayed behaviors consistent with child abuse potential (Costello et al. 2014). Such behaviors may be even more pronounced in overly stressed parents (Taylor et al. 2009). As the present study is the first, to our knowledge, to examine the specific role of abuse potential in relationships between parental stress and child anxiety/withdrawal over time, specific mechanisms by which abuse potential mediates this relationship have not yet been identified. However, changes in child social cognition that accompany the experience of abuse, such as biased processing of threat-related information (attention avoidance; Pine et al. 2005), and a tendency to interpret neutral stimuli as hostile (hostile attribution bias; Dodge et al. 1995, 1990), may explain the association between abuse potential and both child anxiety/withdrawal and child social competence over time.

With regard to anger/aggression, greater parental stress significantly predicted greater child anger/aggression over time, in line with research documenting a predictive relationship between parental stress and child externalizing behavior problems (Krahé et al. 2015). One potential explanation may lie in parental modeling of ineffective stress coping strategies, including aggression, given that stress is associated with empathy impairments (Buruck et al. 2014), which in turn are linked to aggression and interpersonal callousness (Eisenberg et al. 2010), as well as child abuse potential (e.g., McElroy and Rodriguez 2008). Indeed, children are thought to internalize and model observed parental coping strategies in their own social interactions (e.g., Kliewer et al. 1996, 2006), and parental anger, in particular, has been associated with long-term child behavior problems (Denham et al. 2000). Further investigation is needed to identify mechanisms through which parental stress may exacerbate child anger/aggression over time, such as conflicted parent–child interactions, or parental modeling of inappropriate stress-coping strategies.

Interestingly, child anger/aggression did not predict parental stress over time, and child anger/aggression was not related to abuse potential at either time point, in contrast to theory and evidence relating child externalizing behavior problems to increased parental stress (Krahé et al. 2015), and child aggression and externalizing behavior to abuse potential (e.g., Costello et al. 2014; Moreland Begle et al. 2010). One potential explanation for this finding lies in the short period of time between assessments. As with social competence, 8 weeks may not have been enough time for child anger/aggression to impact parental stress. Another explanation could be due to the overall sample of the study, as all parents were enrolled in a parenting program aimed at reducing parental stress. Although we controlled for attendance in the program, mere enrollment in the program and relationships formed with other parents in the group could have mitigated parental stress typically experienced in

response to child anger/aggression. This hypothesis is supported by established research demonstrating that social support can buffer the impact of parental stress among parents of children with and without developmental delays (Boyd 2002; Dyson 1997). These findings suggest that alternative factors associated with the link between child anger/aggression and parental stress must be assessed, including parent social support.

Further, the link between parental stress and child anger/aggression was not mediated by abuse potential, a finding contrary to expectations, but in agreement with research suggesting that ineffective parenting behaviors do not mediate associations between parental stress and child externalizing outcomes (Gutermuth Anthony et al. 2005). Specifically, Gutermuth Anthony et al. (2005) found that parental discipline, nurturing, and expectations did not mediate the relationship between parental stress and child externalizing behavior problems.

Limitations and Future Research Directions

First, the relatively brief time span between study assessments may not reflect changes that occur only over a protracted period. However, associations between each child factor—including social competence, anxiety/withdrawal, and anger/aggression—strengthened over the course of just 8 weeks, indicating the potential for rapid change in these constructs. Based upon findings in the current study, future studies should examine these constructs over longer time periods. Second, the present study relied on parent report to measure child social and behavioral competencies; future research would do well to incorporate multiple informants, as well as observational assessment. Third, abuse potential—rather than actual engagement in abusive behavior—was examined in the present study, precluding conclusions based on children's experience of caregiver-perpetrated abuse. However, research has linked CAPI responses to caregiver engagement in child abuse (e.g., Chaffin and Valle 2003), and to parent reports of using physical and psychological aggression to resolve conflicts with children (Rodriguez 2010a), suggesting that abuse potential is an important risk factor for engagement in abusive behavior, and therefore an important construct for research focused on prevention in a population of young children. Fourth, findings obtained from examining this community—albeit high-risk—sample may not generalize to clinical populations. Further examination of the relationship between parental stress, child abuse potential, and child social and behavioral outcomes is needed in a clinical sample.

Another important limitation concerns the potential for source bias, as measurement of parental stress, abuse potential, and child outcomes relied on parent report. Particular care should be taken when interpreting the present

study due to the overlap between parental stress as measured by the PSI, and items meant to capture parental distress in the CAPI, as suggested by the moderate-high correlation between these constructs ($r = .57$). It is possible this overlap may contribute to proposed indirect effects, highlighting the need for further research assessing child abuse risk in a different manner—perhaps by creating a latent construct from attitudes towards abuse and other risk factors for abusive behavior, without inclusion of parental distress per se—and incorporating reports from varied sources, such as teachers. However, confidence in our findings is increased by differential relationships between other study variables and abuse potential vs. parental stress, including significant relationships between caregiver education and abuse potential, but not parental stress, as well as differential relationships between child outcomes and abuse potential vs. parental stress (e.g., significant associations between abuse potential and anxiety, but not aggression). Nevertheless, this potential confound must be considered.

The current study presented a unique opportunity to examine the complex relationships between parental stress, abuse potential, and child social and behavioral competence over time in a community sample. Findings suggest that abuse potential represents a key mechanism by which parental stress and child anxiety/withdrawal, as well as parental stress and child social competence, are linked. Accordingly, parental stress reduction may be targeted to directly and indirectly reduce child anxiety/withdrawal, and to increase child social competence by reducing abuse potential. Further, screening for child anxiety and social skills deficits may identify children at risk for maltreatment, as well as parents in need of services to reduce stress. Given the short time period over which these relationships were observed, early intervention appears critical to interrupting these processes and preventing negative child outcomes. Future studies should consider specific mechanisms, such as child social cognitive changes, by which parental stress, abuse potential, and child anxiety and social functioning may be linked, and further explore the link between parental stress and child anger/aggression.

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Author Contributions K.I.C: designed the present study (a secondary data analysis using data from the PACE Program, as described in the Method section), conducted data analyses, and wrote the manuscript. A.D.M: collaborated with the design and writing of the present study, as well as the PACE Program, from which data for the present study were drawn.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

References

- Abidin, R. R. (1995). *Parenting Stress Index: Professional Manual* (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc.
- Baker, B. L., Heller, T. L., & Henker, B. (2000). Expressed emotion, parenting stress, and adjustment in mothers of young children with behavior problems. *Journal of Child Psychology and Psychiatry*, *41*(7), 907–915. doi:10.1111/1469-7610.00678.
- Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K. A., Edelbrock, C., & Low, C. (2003). Preschool children with and without developmental delay: Behavior problems and parenting stress over time. *Journal of Intellectual Disability Research*, *47*, 217–230. doi:10.1046/j.1365-2788.2003.00484.x.
- Begle, A. M., & Dumas, J. E. (2011). Child and parental outcomes following involvement in a preventive intervention: Efficacy of the PACE program. *Journal of Primary Prevention*, *32*(2), 67–81. doi:10.1007/s10935-010-0232-6.
- Biederman, J., Faraone, S. V., Mick, E., Spencer, T., Wilens, T., & Kiely, K., et al. (1995). High risk for attention deficit hyperactivity disorder among children of parents with childhood onset of the disorder: A pilot study. *American Journal of Psychiatry*, *152*, 431–435. doi:10.1176/ajp.152.3.431.
- Bigras, M., LaFreniere, P. J., & Dumas, J. E. (1996). Discriminant validity of the parent and child scales of the parenting stress index. *Early Education and Development*, *7*, 157–178. doi:10.1207/s15566935eed0702_5.
- Birmaher, B., Axelson, D., Goldstein, B., Strober, M., Gill, M. K., Hunt, J., & Keller, M. (2009). Four-year longitudinal course of children and adolescents with bipolar spectrum disorder: The course and outcome of bipolar youth (COBY) study. *American Journal of Psychiatry*, *166*, 795. doi:10.1176/appi.focus.10.3.389.
- Boyd, B. A. (2002). Examining the relationship between stress and lack of social support in mothers of children with autism. *Focus on Autism and Other Developmental Disabilities*, *17*(4), 208–215.
- Briggs-Gowan, M. J., Carter, A. S., Moye Skuban, E., & McCue Horwitz, S. (2001). Prevalence of social-emotional and behavioral problems in a community sample of 1- and 2-year-old children. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(7), 811–819. doi:10.1097/00004583-200107000-00016.
- Buruck, G., Wendsche, J., Melzer, M., Strobel, A., & Dörfel, D. (2014). Acute psychosocial stress and emotion regulation skills modulate empathic reactions to pain in others. *Frontiers in Psychology*, *5*, 1–16. doi:10.3389/fpsyg.2014.00517.
- Cabrera, N., & Mitchell, S. (2009). An exploratory study of fathers' parenting stress and toddlers' social development in low-income African American families. *Fathering*, *7*(3), 201–225. doi:10.3149/fth.0703.201.
- Cappa, K., Begle, A. M., Conger, J. C., Dumas, J. E., & Conger, A. (2011). Bidirectional relationships between parenting stress and child coping competence: Findings from the PACE study. *Journal of Child and Family Studies*, *20*, 334–342. doi:10.1007/s10826-010-9397-0.
- Carter, A. S., Wagmiller, R. J., Gray, S. A. O., McCarthy, K. J., Horwitz, S. M., & Briggs-Gowan, M. J. (2010). Prevalence of DSM-IV disorder in a representative, health birth cohort at school entry: Sociodemographic risks and social adaptation. *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*(7), 686–698. doi:10.1016/j.jaa.2010.03.018.
- Chaffin, M., & Valle, L. A. (2003). Dynamic prediction characteristics of the child abuse potential inventory. *Child Abuse and Neglect*, *27*(5), 463–481. doi:10.1016/S0145-2134(03)00036-X.
- Chan, Y. C. (1994). Parenting stress and social support of mothers who physically abuse their children in Hong Kong. *Child Abuse and Neglect*, *18*(3), 261–269. doi:10.1016/0145-2134(94)90110-4.
- Copeland, W. E., Keeler, G., Angold, A., & Costello, E. J. (2007). Traumatic events and posttraumatic stress in childhood. *Archives of General Psychiatry*, *64*, 577–584. doi:10.1001/archpsyc.64.5.577.
- Costa, N. M., Weems, C. F., Pellerin, K., & Dalton, R. (2006). Parenting stress and childhood psychopathology: An examination of specificity to internalizing and externalizing symptoms. *Journal of Psychopathology and Behavioral Assessment*, *28*(2), 113–122. doi:10.1007/s10862-006-7489-3.
- Costello, A. H., Moreland, A. D., Jobe-Shields, L., Hanson, R. F., & Dumas, J. E. (2014). Change in child abuse potential as a predictor of post-assessment child disruptive behaviors after participation in PACE. *Journal of Child and Family Studies*, *24*, 2989–2998. doi:10.1007/s10826-014-0102-6.
- Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, *60*, 837–844. doi:10.1001/archpsyc.60.8.837.
- Crouch, J. L., & Behl, L. E. (2001). Relationships among parental beliefs in corporal punishment, reported stress, and physical child abuse potential. *Child Abuse & Neglect*, *25*(3), 413–419.
- Darwish, D., Esquivel, G. B., Houtz, J. C., & Alfonso, V. C. (2001). Play and social skills in maltreated and non-maltreated preschoolers during peer interactions. *Child Abuse and Neglect*, *25*(1), 13–31. doi:10.1016/S0145-2134(00)00228-3.
- Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, *5*(3), 314–332. doi:10.1111/j.1468-2850.1998.tb00152.x.
- Denham, S., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion*, *21*, 65–86. doi:10.1023/A:1024426431247.
- Denham, S., Workman, E., Cole, P., Weissbrod, C., Kendziora, K., & Zahn-Waxler, C. (2000). Prevention of externalizing behavior problems from early to middle childhood: The role of parental socialization and emotion expression. *Development and Psychopathology*, *12*, 23–45.
- Dodge, K. A., Pettit, G. S., & Bates, J. E. (1997). How the experience of early physical abuse leads children to become chronically aggressive. In D. Cicchetti & S. L. Toth (Eds.), *Rochester symposium on developmental psychology* (Vol. 8, pp. 263–288). Rochester, NY: University of Rochester Press. Developmental perspectives on trauma: Theory, research, and intervention.
- Dodge, K. A., Price, J. M., Bachorowski, J., & Newman, J. P. (1990). Hostile attribution biases in severely aggressive adolescents. *Journal of Abnormal Psychology*, *99*(4), 385–392. doi:10.1037/0021-843X.99.4.385.
- Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology*, *104*(4), 632–643. doi:10.1037/0021-843X.104.4.632.
- Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology*, *21*(2), 179–198. doi:10.1007/BF00911315.
- Duke, N. N., Pettingell, S. L., McMorris, B. J., & Borowsky, I. W. (2010). Adolescent violence perpetration: Associations with

- multiple types of adverse childhood experiences. *Pediatrics*, 125, 778–786. doi:10.1542/peds.2009-0597.
- Dukewich, T. L., Borkowski, J. G., & Whitman, T. L. (1999). A longitudinal analysis of maternal abuse potential and developmental delays in children of adolescent mothers. *Child Abuse & Neglect*, 23(5), 405–420. doi:10.1016/S0145-2134(99)00019-8.
- Dumas, J. E., Prinz, R. J., Smith, E. P., & Laughlin, J. (1999). The EARLY ALLIANCE prevention trial: An integrated set of interventions to promote competence and reduce risk for conduct disorder, substance abuse, and school failure. *Clinical Child and Family Psychology Review*, 2, 37–53. doi:10.1023/A:1021815408272.
- Dumas, J. E., Wolf, L. C., Fisman, S. N., & Culligan, A. (1991). Parenting stress, child behavior problems, and dysphoria in parents of children with autism, down syndrome, behavior disorders, and normal development. *Exceptionality: A Special Education Journal*, 2(2), 91–110. doi:10.1080/09362839109524770.
- Dyson, L. I. (1997). Fathers and mothers of school-age children with developmental disabilities: Parental stress, family functioning, and social support. *American Journal of Mental Retardation*, 102, 267–279.
- Eisenberg, N., Eggum, N. D., & Di Giunta, L. (2010). Empathy-related responding: Associations with prosocial behavior, aggression, and intergroup relations. *Social Issues and Policy*, 4(1), 143–18. doi:10.1111/j.1751-2409.2010.01020.x.
- Gopalan, G., Dean-Assael, K., Klingenstein, K., Chacko, A., & McKay, M. M. (2011). Caregiver depression and youth behavior difficulties. *Social Work in Mental Health*, 9, 56–70. doi:10.1080/15332985.2010.494528.
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of Multiple Imputation Theory. *Prevention Science*, 8(3), 206–213. doi:10.1007/s11212-007-0070-9.
- Guajardo, N. R., Snyder, G., & Petersen, R. (2009). Relationships among parenting practices, parental stress, child behavior, and children's social-cognitive development. *Infant and Child Development*, 18(1), 37–60. doi:10.1002/icd.578.
- Gutermuth Anthony, L., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behavior, and preschoolers' social competence and behavior problems in the classroom. *Infant and Child Development*, 14, 133–154. doi:10.1002/icd.385.
- Haskett, M. E., Ahern, L. S., Ward, C. S., & Allaire, J. C. (2006). Factor structure and validity of the parenting stress index-short form. *Journal of Clinical Child and Adolescent Psychology*, 35(2), 302–312. doi:10.1207/s15374424jccp3502_14.
- Haskett, M. E., Smith Scott, S., & Fann, K. D. (1995). Child abuse potential inventory and parenting behavior: Relationships with high-risk correlates. *Child Abuse & Neglect*, 19(12), 1483–1495. doi:10.1016/0145-2134(95)00107-4.
- Hastings, R. P. (2002). Parental stress and behavior problems of children with developmental disability. *Journal of Intellectual and Developmental Disability*, 27(3), 149–160. doi:10.1080/1366825021000008657.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. doi:10.1080/10705519909540118.
- Huth-Bocks, A. C., & Hughes, H. M. (2008). The impact of parenting stress and parenting behavior on children's adjustment in families experiencing domestic violence. *Journal of Family Violence*, 23, 243–251. doi:10.1007/s10896-007-9148-1.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: The Guilford Press.
- Kliewer, W., Fearnow, M. D., & Miller, P. A. (1996). Coping socialization in middle childhood: Tests of maternal and paternal influences. *Child Development*, 67(5), 2339–2357. doi:10.2307/1131627.
- Kliewer, W., Parrish, K., Taylor, K. W., Jackson, K., Walker, J. M., & Shivy, V. A. (2006). Socialization of coping with community violence: Influences of caregiver coaching, modeling, and family context. *Child Development*, 77(3), 605–623. doi:10.1111/j.1467-8624.2006.00893.x.
- Kolko, D. J., Kazdin, A. E., McCombs, A., & Day, T. B. (1993). Heightened child physical abuse potential: Child, parent, and family dysfunction. *Journal of Interpersonal Violence*, 8(2), 169–192. doi:10.1177/088626093008002002.
- Krahé, B., Bondü, R., Höse, A., & Esser, G. (2015). Child aggression as a source and a consequence of parenting stress: A three-wave longitudinal study. *Journal of Research on Adolescence*, 25(2), 328–339. doi:10.1111/jora.12115.
- LaFreniere, P., & Dumas, J. E. (1996). Peer competence and behavior evaluation in children ages 3 to 6 years: The short form (SCBE-30). *Psychological Assessment*, 8(4), 369–377. doi:10.1037/1040-35990.8.4.369.
- Locher, S. C., Barenblatt, L., Fourie, M. M., Stein, D. J., & Gobodo-Madikizela, P. (2014). Empathy and childhood maltreatment: A mixed-methods investigation. *Annals of Clinical Psychiatry*, 26, 97–110.
- Lopez, C. M., Begle, A. M., Dumas, J. E., & de Arellano, M. A. (2011). Child abuse potential and subsequent coping competence in disadvantaged preschool children: Moderating effects of sex and ethnicity. *Child Abuse and Neglect*, 36, 226–235. doi:10.1016/j.chiabu.2011.10.012.
- Mäntymaa, M., Puura, K., Luoma, I., Latva, R., Salmelin, R. K., & Tamminen, T. (2011). Predicting internalizing and externalizing problems at five years by child and parental factors in infancy and toddlerhood. *Child Psychiatry and Human Development*, 43(2), 153–170. doi:10.1007/s10578-011-0255-0.
- McElroy, E. M., & Rodriguez, C. M. (2008). Mothers of children with externalizing behavior problems: Cognitive risk factors for abuse potential and discipline style and practices. *Child Abuse & Neglect*, 32, 774–784. doi:10.1016/j.chiabu.2008.01.002.
- Medora, N. P., Wilson, S., & Larson, J. H. (2001). Attitudes toward parenting strategies, potential for child abuse, and parental satisfaction of ethnically diverse low-income U. S. mothers. *Journal of Social Psychology*, 141(3), 335–348. doi:10.1080/00224540109600555.
- Milner, J. S., Gold, R. G., Ayoub, C., & Jacewitz, M. M. (1984). Predictive validity of the child abuse potential inventory. *Journal of Consulting and Clinical Psychology*, 52(5), 879–884. doi:10.1037/0022-006X.52.5.879.
- Milner, J. S. (1986). *The child abuse potential inventory: Manual* (2nd ed.). Webster, NC: Psytec.
- Milner, J. S. (1994). Assessing physical child abuse risk: The child abuse potential inventory. *Clinical Psychology Review*, 14(6), 547–583. doi:10.1016/0272-7358(94)90017-5.
- Milner, J. S. (2006). *An interpretive manual for the child abuse potential inventory*. DeKalb, IL: Psytec.
- Milner, J. S., Gold, R. G., & Wimberley, R. C. (1986). Prediction and explanation of child abuse: Cross-validation of the child abuse potential inventory. *Journal of Clinical and Consulting Psychology*, 54(6), 865–866. doi:10.1037/0022-006X.54.6.865.
- Moreland Begle, A., Dumas, J. E., & Hanson, R. F. (2010). Predicting child abuse potential: An empirical investigation of two theoretical frameworks. *Journal of Clinical Child & Adolescent Psychology*, 39(2), 208–219. doi:10.1080/15374410903532650.
- Muthén, L. K., & Muthén, B. O. (2012). *MPlus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Nair, P., Schuler, M. E., Black, M. M., Kettinger, L., & Harrington, D. (2003). Cumulative environmental risk in substance abusing women: Early intervention, parenting stress, child abuse

- potential, and child development. *Child Abuse & Neglect*, 27(9), 997–1017. doi:[10.1016/S0145-2134\(03\)00169-8](https://doi.org/10.1016/S0145-2134(03)00169-8).
- Neece, C., & Baker, B. (2008). Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behaviour problems and social skills. *Journal of Intellectual Disabilities Research*, 52(12), 1114–1128. doi:[10.1111/j.1365-2788.2008.01071.x](https://doi.org/10.1111/j.1365-2788.2008.01071.x).
- Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal of Intellectual and Developmental Disabilities*, 117(1), 48–66. doi:[10.1352/1944-7558-117.1.18](https://doi.org/10.1352/1944-7558-117.1.18).
- Perez-Albeniz, A., & de Paul, J. (2004). Gender differences in empathy in parents at high- and low-risk of child physical abuse. *Child Abuse & Neglect*, 28(3), 289–300. doi:[10.1016/j.chiabu.2003.11.017](https://doi.org/10.1016/j.chiabu.2003.11.017).
- Pine, D. S., Mogg, K., Bradley, B. P., Montgomery, L., Monk, C. S., McClure, E., & Kaufman, J. (2005). Attention bias to threat in maltreated children: Implications for vulnerability to stress-related psychopathology. *American Journal of Psychiatry*, 162, 291–296.
- Podolski, C. L., & Nigg, J. T. (2001). Parent stress and coping in relation to child ADHD severity and associated child disruptive behavior problems. *Journal of Clinical Child Psychology*, 30(4), 503–513. doi:[10.1207/S15374424JCCP3004_07](https://doi.org/10.1207/S15374424JCCP3004_07).
- Reef, J., Diamantopoulou, S., Van Meurs, I., Verhulst, F., & Van Der Ende, J. (2009). Child to adult continuities of psychopathology: A 24-year follow up. *Acta Psychiatrica Scandinavica*, 120(3), 230–238. doi:[10.1111/j.1600-0447.2009.01422.x](https://doi.org/10.1111/j.1600-0447.2009.01422.x).
- Rodriguez, C. M. (2003). Parental discipline and abuse potential effects on child depression, anxiety, and attributions. *Journal of Marriage and Family*, 65(4), 809–817. doi:[10.1111/j.1741-3737.2003.00809.x](https://doi.org/10.1111/j.1741-3737.2003.00809.x).
- Rodriguez, C. M. (2010a). Parent-child aggression: Association with child abuse potential and parenting styles. *Violence and Victims*, 25(6), 728–741. doi:[10.1891/0886-6708.25.6.728](https://doi.org/10.1891/0886-6708.25.6.728).
- Rodriguez, C. M. (2010b). Personal contextual characteristics and cognitions: Predicting child abuse potential and disciplinary style. *Journal of Interpersonal Violence*, 25(2), 315–335. doi:[10.1177/0886260509334391](https://doi.org/10.1177/0886260509334391).
- Rodriguez, C. M. (2013). Analog of parental empathy: Association with physical child abuse risk and punishment intentions. *Child Abuse & Neglect*, 37(8), 493–499. doi:[10.1016/j.chiabu.2012.10.004](https://doi.org/10.1016/j.chiabu.2012.10.004).
- Rodriguez, C. M., & Green, A. J. (1997). Parenting stress and anger expression as predictors of child abuse potential. *Child Abuse & Neglect*, 21(4), 367–377. doi:[10.1016/S0145-2134\(96\)00177-9](https://doi.org/10.1016/S0145-2134(96)00177-9).
- Rodriguez, C. M., & Richardson, M. J. (2007). Stress and anger as contextual factors and pre-existing cognitive schemas: Predicting parental child maltreatment risk. *Child Maltreatment*, 12(4), 325–337. doi:[10.1177/1077559507305993](https://doi.org/10.1177/1077559507305993).
- Ruchkin, V., Henrich, C. C., Jones, S. M., Vermeiren, R., & Schwab-Stone, M. (2007). Violence exposure and psychopathology in urban youth: The mediating role of posttraumatic stress. *Journal of Abnormal Child Psychology*, 35, 578–593. doi:[10.1007/s10802-007-9114-7](https://doi.org/10.1007/s10802-007-9114-7).
- Schaeffer, C. M., Alexander, P. C., Bethke, K., & Kretz, L. S. (2005). Predictors of child abuse potential among military parents: Comparing mothers and fathers. *Journal of Family Violence*, 20(2), 123–129. doi:[10.1007/s10896-005-3175-6](https://doi.org/10.1007/s10896-005-3175-6).
- Taylor, C. A., Guterma, N. B., Lee, S. J., & Rathouz, P. (2009). Intimate partner violence, maternal stress, nativity, and risk for maternal maltreatment of young children. *American Journal of Public Health*, 99(1), 175–183. doi:[10.2105/AJPH.2007.126722](https://doi.org/10.2105/AJPH.2007.126722).
- Theule, J., Wiener, J., Tannock, R., & Jenkins, J.M. (2010). Parenting stress in families of children with ADHD: A meta-analysis. *Journal of Emotional and Behavioral Disorders*, 20(2). doi:[10.6342/6610387433](https://doi.org/10.6342/6610387433).
- Walker, L. O., & Cheng, C.-Y. (2007). Maternal empathy, self-confidence, and stress as antecedents of preschool children's behavior problems. *Journal for Specialists in Pediatric Nursing*, 12(2), 93–104. doi:[10.1111/j.1744-6155.2005.00098.x](https://doi.org/10.1111/j.1744-6155.2005.00098.x).
- Weissman, M. M., Bland, R. C., Canino, G. J., Faravelli, C., Greenwald, S., Hwu, H. G., & Yeh, E. K. (1996). Crossnational epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association*, 276, 293–299. doi:[10.1001/jama.1996.03540040037030](https://doi.org/10.1001/jama.1996.03540040037030).
- Whipple, E. E., & Webster-Stratton, C. (1991). The role of parental stress in physically abusive families. *Child Abuse and Neglect*, 15(3), 279–291. doi:[10.1016/0145-2134\(91\)90072-L](https://doi.org/10.1016/0145-2134(91)90072-L).
- Whiteside-Mansell, L., Ayoub, C., McKelvey, L., Faldowski, R. A., Hart, A., & Shears, J. (2007). Parenting stress of low-income parents of toddlers and preschoolers: Psychometric properties of a short form of the parenting stress index. *Parenting Science and Practice*, 7, 27–56. doi:[10.1080/15295190709336775](https://doi.org/10.1080/15295190709336775).
- Zhou, Q., Eisenberg, N., Losoya, S. H., Fabes, R. A., Reiser, M., Guthrie, I. K., & Shepard, S. A. (2002). The relations of parental warmth and positive expressiveness to children's empathy-related responding and social functioning: A longitudinal study. *Child Development*, 73(3), 893–915. doi:[10.1111/1467-8624.00446](https://doi.org/10.1111/1467-8624.00446).