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Cognitive readiness to parent, stability and change in postpartum parenting stress and social-emotional problems in early childhood: A second order growth curve model

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ABSTRACT

Parenting stress (PS) is prospectively associated with children's lowered socio-emotional functioning; however, little is known about the antecedents and consequences of *changes* in postpartum parenting stress and its relationship to problematic behaviors in early childhood. This research examined the longitudinal relationships between multiple measures of cognitive readiness to parent, parenting stress (initial level and growth) and child social-emotional competence at age 3. It was hypothesized that lack of cognitive readiness to parent would predict initial level and growth in PS and that initial level and change in parenting stress would, in turn, would be related to poor social-emotional development. Cognitive readiness to parent was assessed at baseline shortly after childbirth; parenting stress, conceptualized as difficult child, parent-child dysfunction and parental distress, was assessed at 6, 12, 24 and 36 months postpartum (i.e. when children were 6 months, 1, 2 and 3 years of age) using the *Parenting Stress Index* (PSI-SF; Abidin, 1995); children's socio-emotional functioning was assessed with behavioral rating scale of the Bayley Scales of Infant Development (BSID-II) (BSID-II; Bayley, 1993) which was administered by professionals at age 3. Using a second order growth curve, or curve-of-factors model, the study's hypotheses were tested with data from the *Predicting and Preventing Neglect in Teen Mothers Study* (2001–2007), a longitudinal study of 682 first-time mothers. Results from the latent growth curve analyses demonstrated that parenting stress predicted child socio-emotional problems. Specifically, mothers who began parenthood with high stress levels had children with lower levels of pro-social functioning (i.e. more behavior problems). Two measures of cognitive readiness to parent were associated with lower levels of postpartum PS at baseline but social support moderated the relationship between readiness to parent and parenting stress. Implications for interventions aimed at identifying families with children at risk for emotional and developmental problems and/or new parents who demonstrate changes in parenting stress during the postpartum period are discussed in context.

1. Introduction

Socio-emotional development, broadly conceptualized as the emergent capacity to experience, control, express feelings and form close and secure interpersonal connections, is an important component of healthy child development (Metwally et al., 2016). Poor socio-emotional competence has been associated with lower levels of school adjustment and academic achievement (Morrison, Ponitz, & McClelland, 2010), increased risk for substance use, sexual risk-taking (Timmermans, Van Lier, & Koot, 2008), psychopathology (Shipman, Schneider, & Brown, 2004; Henricsson & Rydell, 2006), teenage delinquency and adult violence (Herrenkohl et al., 2000; Tremblay et al., 2004). Consistent with a socio-ecological perspective of human development, poor developmental outcomes in early childhood have a complex etiology rooted in a broad array of individual (e.g. biological, psychological) and contextual (e.g. family and cultural) factors (Steiner & Remsing, 2007). Developmental disorders are more common in males than females (Baillargeon et al., 2007), among lower income versus higher income adolescents (Feil, Walker, Severson, & Ball, 2000; Kaiser, Cai, Hancock, & Foster, 2002), and among youth involved in the child welfare system (Barboza, Dominguez, & Pinder, 2017; Keil & Price, 2006). Identifying the factors related to poor socio-emotional development is critical in order to curb the negative, long-term psychosocial sequelae resulting from behavioral and emotional dysregulation in children.

Socio-emotional delays in infants and toddlers has been linked to early developmental contexts that increase levels of parenting stress (Crnic & Low, 2002; Deater-Deckard, 2005). Parental stress is one

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domain of family risk that assumes relevance for the emergence, or exacerbation, of behavior problems in children (Crnic and Greenberg, 1990). Higher levels of parenting stress are associated with child internalizing and externalizing syndrome development including aggressive and impulsive behaviors and emotional dysregulation (Williford, Calkins, & Keane, 2007; Costa, Weems, Pellerin, & Dalton, 2006; Deater-Deckard, Pinkerton, & Scarr, 1996). Parenting stress influences child behavior through negative parenting behaviors, since highly stressed parents often engage in ineffective, harsh and/or inconsistent parenting strategies (Briggs-Gowan, Carter, Skuban, & Horwitz, 2001; Anthony et al., 2005).

2. Postpartum parenting stress

Pregnancy and the transition to parenthood can be particularly stressful for individuals and families (Perren, Von Wyl, Bürgin, Simoni, & Von Klitzing, 2005). The level of parenting stress felt by new mothers, as well as changes in parenting stress during the postpartum period, has significant implications for healthy family functioning and child outcomes (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Parenting stress is a complex, multidimensional construct that involves behavioral, cognitive, and affective components of parent and parent-child relationships as well as contextual features of families as they relate to the appraisal of one's role as a parent (Abidin, 1992; Whiteside-Mansell et al., 2007)." Given the intensity of parenting demands and "caretaking hassles" associated with parenting, particularly among new mothers, it is not surprising that previous research has found that as many as 22.9% of mothers experience clinically significant levels of parenting stress (Combs-Orme, Cain, & Wilson, 2004).

Most of the extant research on parenting stress has used cross-sectional designs that provide only a snapshot of parenting stress at one moment in time. Fewer studies have investigated parenting stress longitudinally. This is surprising given that the accumulation of parenting stress is greater for young mothers during the first 3 years of a child's life (Chang & Fine, 2007; Zajicek-Farber, Mayer, & Daughtery, 2012), that "stressed parents tend to remain stressed, and [that] cumulative stress may build across developmental periods to create increased risk for parenting and child functioning (Crnic, Gaze, & Hoffman, 2005, p. 128)." The longitudinal studies of parenting stress that do exist have yielded conflicting results (Berryhill, Soloski, Durtschi, & Adams, 2016). Spinelli, Poehlmann, and Bolt (2013) examined parenting stress trajectories in a sample of mothers with preterm infants over a three-year period and found that parenting stress increased slightly between 4 and 36 months. In contrast, Williford et al. (2007) found that parenting stress declined among mothers with children between the ages of 2–5 (Williford et al., 2007). Nevertheless, both studies, using similar composite indicators of parenting stress and statistical modeling techniques, noted significant interindividual variability in patterns of parenting stress – an indication that not all mothers follow the same downward trajectory. As Williford et al. (2007) suggested, "a better understanding of stability and change of parenting stress over the course of early childhood would have important implications not only for understanding the development of behavior problems but also for the design of effective early preventive and intervention programs (Williford et al., 2007, p. 251). Therefore, the present research fills a gap in the current literature by exploring the longitudinal trajectories of postpartum parenting stress, as well as the correlates thereof, in a sample of first-time mothers identified as being at risk.

3. Predictors of parenting stress

Lack of cognitive readiness to parent has been repeatedly demonstrated to be in important source of parenting stress (Abidin, 1983; Mulsow, Caldera, Pursley, Reifman, & Huston, 2002; Ostberg & Hagekull, 2000; Sommer et al., 1993). Lack of cognitive readiness to parent is typically defined as parents' lack of knowledge of infant development, lack of responsivity to children's needs and/or the failure to adopt appropriate parenting practices (Sommer et al., 1993; McElroy & Rodriguez, 2008). Lack of cognitive readiness to parent is more characteristic of new parents, teenage parents (Passino et al., 1993), and/or parents experiencing financial strain (Seccombe, 2000). Studies have shown that adolescent mothers systematically underestimate the timing of emerging abilities across all domains, have a very compact view of child development (Tamis-Lemonda, Shannon, & Spellmann, 2002), and expect unusually early attainment of developmental milestones. One study found that even after controlling for maternal IQ, socioeconomic status, race and education, cognitive readiness to parent exerted a statistically significant effect on maternal stress levels (Sommer et al., 1993). The study further found that cognitive readiness to parent predicted critical aspects of maternal-child interactions, the reinforcement children provide their mothers, restriction of maternal roles and maternal feelings of bonding – all characteristics related to parenting stress.

In addition to cognitive readiness to parent, extant research suggests that a broad array of maternal, child, and contextual factors may influence new mothers' postpartum parenting stress levels (Chang & Fine, 2007; Deater-Deckard et al., 1994). Maternal age has been associated with parenting stress levels, but the nature of the influence is unclear. Some studies have shown that older mothers report more stress (Ostberg & Hagekull, 2000) whereas other studies have found no relation between age and stress levels (Chang & Fine, 2007). These differences may be due to the nature of the sample, more specifically the range of ages represented in existing studies. Lack of confidence in one's parental ability has been associated with increasing levels parenting stress, including more conflict between parents, less positive parental affect towards children (Crnic et al., 1986) and less positive parenting behaviors (e.g. ineffective parental discipline and control) (Stern, Smith, & Jang, 1999). The availability of adequate social support systems increases parenting stress (Crnic, Greenberg, & Slough, 1986; Lindberg, Bohlin, Hagekull, & Thunström, 1994) and acts as a buffer against both the experience of stress and against the influence of stress on other areas of functioning (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983). Other contributing factors to parenting stress, include marital disruption and/or being unpartnered (Webster-Stratton, 1989), stressful life events (Elder, Van Nguyen, & Caspi, 1985) and low socioeconomic status (Ostberg & Hagekull, 2000; Chang et al., 2004).

4. The mediating role of parenting stress

Researchers typically hypothesize a unidirectional relation whereby child behavior problems are a source of parenting stress (Stores, Stores, Fellows, & Buckley, 1998; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Herring et al., 2006), and not vice versa. In contradistinction are studies suggesting that the nature of the relation between child behavior problems and parenting stress may be bidirectional (Baker et al., 2003; Orsmond, Seltzer, Krauss, & Hong, 2003; Neece, Green, & Baker, 2012). For example, past research has clearly demonstrated that parenting stress is associated with attention problems, disobedience and aggression in children (Jackson, Brooks-Gunn, Huang, & Glassman, 2000). As well, studies have shown that parenting stress in infancy exerts an effect on future child behavior (Benzies, Harrison, & Magill-Evans, 2004). Irrespective of research identifying parenting stress as a risk factor for maladaptive parenting and negative child outcomes, both cross-sectionally and longitudinally, the mechanisms by which parenting stress impacts child outcomes remain unclear (Deater-Deckard, 2005). For example, parenting stress may play a significant mediational role in the association between lack of cognitive readiness to parent and children's socio-emotional competence. That is, parents who have unreasonable expectations regarding child development, lack responsiveness to their children's needs and/or knowledge of appropriate parenting practices may be more inclined to experience parenting

stress. In turn, high levels of parenting stress have been associated with lower levels of social-emotional competence in children (Jackson et al., 2000).

5. Current study

The present investigation examines the direct and indirect effects of postpartum parenting stress on socioemotional competence in children. In this vein, the study had three overarching goals. The first goal was to describe the longitudinal trajectory of postpartum parenting stress among first time mothers. Given the demands associated with new motherhood, it was hypothesized that parenting stress would increase during the first three years following childbirth. The second goal was to examine the mediating role of initial level and growth in postpartum parenting stress and its impact on future child behavior. Given past research, the expectation was that mothers who are cognitively ready to parent experience less parenting stress which would, in turn, contributes to higher levels of socio-emotional competence in children. The third and final goal of this study was to explore the moderating impact of social support on the relation between lack of cognitive readiness to parent and parenting stress. Given previous research showing that social support moderates the relation between parenting behavior and parenting stress, the expectation was that mothers who are less ready to parent but have relatively higher levels of social support will experience less parenting stress at baseline and less growth in parenting stress over time.

6. Methods

6.1. Participants

Participants ($N = 682$) were drawn from the '*Predicting And Preventing Child Neglect In Teen Mothers*' study (2001–2007) which was designed to assess the impact of varying degrees and types of neglect and poor parenting on children's development during the first 3 years of life. Participants were recruited through primary care facilities in Birmingham, Alabama, Kansas City, Kansas, South Bend, Indiana, and Washington, D.C. The survey included a broad array of assessments about parenting characteristics, parenting behaviors and attitudes, and child development across multiple domains (e.g., social and emotional well-being). These assessments were chosen based on their relation to childhood neglect potential. Mothers were interviewed during the last trimester of their pregnancy and when their children were 4, 6, 8, 12, 18, 24, 30, and 36-months old. The present study used five waves of data: demographic data measured during the last trimester of pregnancy and data collected when children were 6, 12, 18 and 36 months.

7. Measures

7.1. Mediator variables

7.1.1. Parenting Stress Index (PSI-SF; Abidin, 1995)

Based on caregiver report, the Parenting Stress Index Short Form (PSI-SF) is derived from 36 items of the Parenting Stress Index (Abidin, 1995) that was administered at 6, 12, 24 and 36 months postpartum. The PSI was developed to identify stressors originating in the parent, child and parent-child interaction (Abidin, 1995; Abidin, Austin, & Flens, 2013). It includes a total (composite) score as well as three subscales each containing 12 items; *Parenting Distress* (PD) (e.g., "I feel trapped by my responsibilities as a parent."), *Parent–Child Dysfunctional Interactions* (PCD) (e.g., "Sometimes my child does things that bother me just to be mean."), and *Difficult Child* (DC) (e.g., "My child generally wakes up in a bad mood."). Ratings were recorded on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The PSI has been internationally cross validated and has demonstrated high construct, discriminant and predictive validity (Abidin, 1995, Abidin et al., 2013; Kornør & Martinussen, 2011).

7.2. Independent variables

Cognitive readiness to parent was measured with three variables that gauge knowledge of infant development, parenting philosophy and the availability of psychological resources necessary to fulfill the parenting role. Philosophy of parenting was measured using the 'Empathetic Awareness Toward Children's Needs Scale' ("responsivity-empathy") of the Adult-Adolescent Parenting Inventory (AAPI) (Bavolek, 1984). The empathetic awareness subscale includes 8 questions that evaluate parents' ability to identify and respond to their child's needs in an appropriate manner. Items include questions such as "Young children who feel secure often grow up expecting too much", "It's good for a parent to set a 4-year-old on the toilet for an hour after the child messed up his pants," and "Children will quit crying faster if you ignore them." Ratings were recorded on a Likert-type scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Higher scores are associated with positive parenting orientations. The empathetic awareness scale has previously demonstrated good internal consistency (Cronbach's $\alpha = 0.81$; Trentacosta & Shaw, 2008) and construct validity (see Bavolek, 1989).

Knowledge of infant development was assessed using the Knowledge of Infant Development Inventory – Short Form (KIDI; MacPhee, 1981). The KIDI questionnaire asks mothers' level of agreement on 14 items measuring their knowledge of developmental processes and milestones on a 5-point scale from 1 (*strongly agree*) to 5 (*strongly disagree*). Example items include: "All infants need the same amount of sleep" and, "The mother (or father) needs only to feed, clean and dress the baby for him/her to be well." This measure has shown high test–retest reliability (Cronbach's $\alpha = 0.92$) and good internal consistency (Cronbach's $\alpha = 0.82$) (MacPhee, 1981). Both the Empathetic Awareness Toward Children's Needs and the Knowledge of Infant Development subscales have been used to measure cognitive readiness to parent in previous studies (e.g., Sommer et al., 1993).

Psychological resources were conceptualized as self-efficacy in the parenting role and measured based on items from the Perlin self-mastery scale (Pearlin & Schooler, 1978). The 6-item scale include statements such as "I feel I have the skills to be a good parent." "I feel I can be a good role model for my children." "I feel insecure about meeting the material needs (such as - clothes, food) of my children." Response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) such that increasing values indicated higher levels of parental self-efficacy. Scale reliability demonstrated adequate reliability (Cronbach's $\alpha = 0.69$).

7.2.1. Difficult life circumstances

Stressful life circumstances were measured using the Difficult Life Circumstances Scale (Barnard, 1994), a 28-item measure of stressful events including domestic violence, financial problems, unemployment, housing insecurity, substance use issues and violent victimization. Respondents indicated whether they experienced each stressor with yes/no responses that were summed to yield a total score. Higher values were indicative of greater numbers of difficult life circumstances. The total score has demonstrated good reliability (1-year test–retest correlation = 0.70 for the total score; Johnson, Booth, & Barnard, 1989).

7.2.2. Child abuse potential

The Child Abuse Potential Index (CAPI; Milner, 1986) is a self-report questionnaire originally designed to provide an estimate of parental risk in suspected cases of child physical abuse but has since been used as a risk screening tool in a variety of assessment situations. The CAPI is subdivided into six factor scales: Distress, Rigidity, Unhappiness, Problems with Child and Self, Problems with Family, and Problems with Others. The present study utilized the unhappiness subscale which provides a measure of dissatisfaction with life and in relationships (Milner, 1990). Respondents were asked their level of agreement with

to statements such as “People expect too much from me” and “I laugh every day.” A total score was derived from item summation with higher scores indicative of greater child abuse potential. The CAPI has a test-retest reliability index of 0.90 and internal consistency estimates that ranges from 0.92 to 0.95 across different samples (Milner, 1986).

7.3. Dependent variable

7.3.1. Child developmental status

The Bayley Scales of Infant Development, 2nd edition (BSID-II; Bayley, 1993) were administered at the 36-month follow-up by examiners blind to mothers’ level of parenting stress. The Behavior Rating Scale of the BSID-II measures the current developmental status of the toddlers and has been recognized as a way of diagnosing developmental disorders in young children (American Psychiatric Association, 2000). The BSID-II is a norm-referenced assessment instrument that evaluates the current level of functioning by considering infant’s age as well as whether he or she was a premature birth. It is administered by professionals who are trained to evaluate toddlers’ orientation and engagement (e.g., positive affect, interest in the test materials), emotion regulation (e.g., frustration with inability to complete tasks, adaptation to change in test materials) and motor quality (e.g., fine motor movement required by tasks, hypotonicity). The scores are expressed as percentiles for the total score. The BSID-II has been shown to demonstrate good internal consistency, test-retest, and interrater reliability (Bayley, 1993).

7.4. Moderator variables

7.4.1. Social support

Maternal social support was assessed using an adapted version of the Maternal Social Support Index (MSSI; Pascoe, Ialongo, Wade, Reinhart, & Perradatto, 1988). Participants responded to each of the nine items by indicating the level of help received with daily tasks. For each participant, the items were summed to obtain a total score representing the average number of people available to help with all such tasks. Higher scores represented more support. Reliability was good (Cronbach’s $\alpha = 0.79$).

7.5. Control variables

Control variables included demographic characteristics such as maternal age, relationship status, race, receipt of welfare benefits and maternal education level assessed during the last trimester of pregnancy. Relationship status was recoded as partnered (married or “in a relationship”) or unpartnered (divorced, separated, widowed, or single). Maternal race was recoded into one dummy variable – white versus non-white – with “white” as the reference group. Education was recoded to create a scale ranging from less than high school (1) to completed graduate school (5).

7.6. Statistical analysis

This study extends a longitudinal confirmatory factor analysis to a second order growth curve model, also known as a curve of factors model (COFM). The COFM is a second-order growth curve model that incorporates multiple indicator variables of the latent factor of interest at each measurement occasion and fits a growth curve to the factor scores (Wickrama, Lee, O’Neal, & Lorenz, 2016). The first-order factors represent the latent construct of interest at each time point (i.e. for each wave of PS). These factors are then modeled to load on the second-order latent growth factors which are, in this context, the intercept and slope. A COFM offers several advantages over a traditional growth curve modeling framework (see, Wickrama et al., 2016). First, unlike traditional growth curve models using composite measures of PS, a COFM allows each subdomain of parenting stress (i.e. difficult child, parent-child dysfunction, parent distress), to differentially contribute to the global parenting stress domain. Second, the COFM allows for the use of multiple indicators of parenting stress at each time point. Third, the use of multiple indicators makes it possible to test for measurement invariance by constraining factor loadings, intercepts and residual variances to be equal across time. Fourth, a COFM separates the variance of the global parenting stress measure into item-specific variance components that capture measurement error in the manifest indicators. Finally, by incorporating autocorrelation among the manifest indicators, the influence of parenting stress at one point in time on parenting stress at subsequent time points can be captured.

To begin the modeling process, the longitudinal correlation patterns among the three subdomains of parenting stress (i.e. difficult child, parent-child dysfunction and parent distress) were initially investigated. Once the measurement model was specified, an unconstrained longitudinal confirmatory factor model (LCFA) was estimated using the three measures of parenting stress and a growth curve was fit to the factor scores. Finally, to assess change in parenting stress over time, a curve-of-factors model (COFM; McArdle, 1988) was fit using three waves of data in the three years following the birth of a first child. After assessing whether there was significant change in parenting stress over time, baseline measures of maternal-responsivity and child externalizing at age 3 (i.e. Time 4) were added to the model. The parenting stress intercept and slope were regressed onto the measure of maternal empathy-responsivity and then maternal empathy-responsivity and the parenting stress intercept and slope were regressed on child externalizing symptoms. The final model included both direct and indirect effects of parenting stress and controlled for age, marital status, race/ethnicity and education.

Throughout the modeling process, autocorrelations among the errors were introduced where appropriate to investigate error variances and covariances, improve model fit, and avoid model misspecification (Little, 2013). A marker variable approach was taken where one indicator is set to 1 for each time point and its intercept is set to 0. Multiple forms of measurement invariance were ascertained: weak (i.e. factor loadings were invariant across time), strong (i.e. mean parameters were invariant across time), strong partial (i.e. some mean parameters) and strict (i.e. error variances of the indicators). At each step, modification indices were explored, and significant correlations were freed when necessary to achieve a better model fit. All analyses were conducted using Mplus 8.4 using Maximum Likelihood Estimation which utilizes all available data and givens consistent estimates of population values when data are missing at random (Feldman & Rabe-Hesketh, 2012). Model fit was determined in accordance with previous research (i.e., Comparative Fit Index (CFI) > 0.90; Root Mean Square Error of Approximation (RMSEA) < 0.05) (Little, 2013).

8. Results

Descriptive statistics for the sample are shown in Table 1. The average age of the sample was 21.2 (sd = 5.09). Among the respondents, a plurality were unwed teenagers (41.4%), 15.8% were teenagers in a relationship (either married or with a partner) and 42.8% were not in their teens. Almost 75% of the women had no more than a high school education. The majority self-identified as non-Hispanic Black (65.5%) followed by non-Hispanic White (18.7%) and Hispanic (15.25%). Most women were single but 37.72% reported being married or in a relationship. The overwhelming majority of mothers claimed to be receiving governmental assistance (e.g. Food Stamps, etc) and 59.4% reported being unemployed. Each mother reported receiving 1.79 (sd = 1.36) benefits from the government, on average. The DC, PCD and PD measures of parenting stress ranged from 22.47 to 25.51, 18.58–19.40 and 24.62–28.24, respectively. At 6 months postpartum (Time 1), the average level of maternal empathy-responsivity was 31.42 (s.d. = 5.69) and at Time 4 the average raw score on the BDI-II was 118.1 (s.d. = 11.83). Correlations indicated that responsivity-empathy

Table 1
Demographic characteristics of Sample (N = 682).

Variable	%	Mean (S.D.)
Marital Status		
Single	61.69	
Married	16.12	
With Partner	21.60	
Separated	0.30	
Divorced	0.15	
Widowed	0.15	
Education		
Less than HS	49.26	
HS Graduate	24.34	
Some College	8.41	
College Graduate	14.16	
Graduate/Professional School	3.83	
Employment Status		
Working	40.6	
Not Working	59.4	
Receiving Gov't Assistance		
Yes	79.3	
No	20.7	
Average # Welfare Services Mother is Receiving		1.79 (1.36)
Race/Ethnicity		
Non-Hispanic Black	64.52	
Non-Hispanic White	18.77	
Hispanic	15.25	
Other	1.47	
Mom's Age at Birth		21.2 (5.09)
Marital/Age Status		
Teen Mom	15.8	
Unwed Teen Mom	41.4	
Not a Teen Mom	42.8	
Difficult Life Circumstances		2.03 (1.90)
Parenting Stress		
Difficult Child (Time 1)		22.47 (6.04)
Difficult Child (Time 2)		24.10 (7.12)
Difficult Child (Time 3)		25.25 (7.99)
Difficult Child (Time 4)		25.51 (8.42)
Parent-Child Dysfunction (Time 1)		19.12 (6.61)
Parent-Child Dysfunction (Time 2)		18.58 (6.13)
Parent-Child Dysfunction (Time 3)		19.40 (7.38)
Parent-Child Dysfunction (Time 4)		19.05 (7.02)
Parenting Distress (Time 1)		28.24 (8.81)
Parenting Distress (Time 2)		26.58 (8.35)
Parenting Distress (Time 3)		26.00 (9.28)
Parenting Distress (Time 4)		24.62 (9.00)
Cognitive Readiness to Parent		
Maternal Responsivity-Empathy (Time 1)		31.43 (5.69)
Knowledge of Infant Development Index (Time 1)		50.18 (6.86)
Parenting Self-Efficacy (Time 1)		102.2 (14.45)
Child Abuse Potential Inventory (Unhappiness Scale) (Time 1)		11.97 (11.21)
Behavioral Development Inventory (Time 4)		118.1 (11.83)

was inversely related to parenting stress symptoms at each wave (Time 1: $r = -0.474$, p < .001; Time 2: $r = -0.326$ p < .001; Time 3: $r = -0.357$, p < .001; Time 4: $r = -0.207$ p < .001); KIDI was inversely related to parenting stress symptoms at time point 2 (Time 2: $r = -0.324$ p < .001); and that PSE was inversely related to parenting stress symptoms at each wave (Time 1: $r = -0.632$, p < .001; Time 2: $r = -0.518$ p < .001; Time 3: $r = -0.475$, p < .001; Time 4: $r = -0.480$ p < .001). As well, parenting stress was inversely related to BDI-II score at times 2 and 4 (Time 2: $r = -0.166, p < .027$; Time 4: $r = -0.138, p < .023$).

8.1. Longitudinal correlation patterns of parenting stress

Table 2 shows the observed correlation matrix for the three subdomains of parenting stress over time. As shown by the table, correlations among the three subdomain indicators (DC, PCD and PS) at the same occasion were highly correlated and statistically significant ($p < .001$). More specifically, the correlation coefficients ranged from 0.48 to 0.58 for PD and PCD, 0.40 to 0.61 for DC and PD, and 0.57 to 0.65 for DC and PCD (see the bolded coefficients in Table 2). Since the correlation coefficients among subdomain indicators of the global latent domain of parenting stress at the same time point were higher than the correlation coefficients among the same subdomain indicators at different time points of autocorrelation, a global latent factor of parenting stress for each of the four time points was plausible and the use of a LCFA model justified (Little, 2013).

8.2. Unconstrained configural LCFA

Model fit indices for the estimated models are presented in Table 3. The results of the null model, i.e. the initial LCFA without autocorrelated errors, indicated a poor fit to the data ($\chi^2(df) = 541.81(55)$, $p < .01$; CFI = 0.796; RMSEA = 0.131; SRMR = 0.083). To improve model fit, modification indices were examined and error correlations were incorporated into the model. Given that existing research has illustrated a high level of interrelationships among parenting stress over time, these error correlations were justified and not unexpected. The resulting LCFA (M2) provided an excellent fit to the data

$\chi^2(df) = 30.27(25)$, $p < .01$; CFI = .998; RMSEA = .020; SRMR = .028).

Inspection of the standardized factor loadings for each subdomain manifest variable comprising the global latent domain of parental stress (PS) revealed that they were within acceptable guidelines (> =0.60) (Matsunaga, 2010) (0.68 to 0.77 at time 1, 0.69 to 0.80 at time 2, 0.72 to 0.81 at time 3, and 0.74 to 0.80 at time 4). The results suggested that DC, PCD and PD are indicators of a latent factor of PS. Observed correlations among latent factors were in the moderate to high range (0.56–0.71, p < .001), indicating modest correlations among the latent global factors and acceptable discriminant validity over time. All but four of the autocorrelated errors among specific domains of parental distress were statistically significant and in the expected direction (0.07–0.41 for DC; 0.34–0.54 for PCD; and 0.38–0.50 for PD) even after controlling for the correlations between the latent factors of parenting stress at different time points.

8.3. Measurement invariance across time

Measurement invariance (configural, weak, strong and strict) was tested systematically by constraining the parameters and examining changes in CFI between models (Cheung & Rensvold, 2002). Results of the nested model comparisons are shown in Table 3 (M3 to M6). Model 3 imposed constraints on the factor loadings only. The resulting model did not significantly reduce the model fit compared to M2 ($\Delta\chi^2(df) = 16.0(6)$, $p < .01$; ΔCFI = 0.004). Therefore, the assumption of weak invariance was met. Models M4 and M6 imposed equality constraints on both the factor loadings and the intercepts (i.e., strong invariance) and error variances (i.e., strict) across all waves, respectively. The results indicated that the invariance assumption was violated. Using the modification indices, manifest variables and residual variances that were not time invariant were identified and the constraint of invariance was removed for those items, resulting in a strong partial invariance model (M5). The $\Delta\chi^2$ statistic indicated a that M5 represented a statistically significant improvement in model fit compared to M3 ($\Delta\chi^2(df) = 31.24(10)$, $p < .01$) and provided a good overall fit to the data ($\chi^2(df) = 77.55(41)$, $p < .01$; CFI = 0.985; RMSEA = 0.042; SRMR = 0.054). In addition, the change in CFI was < 0.01 (ΔCFI = 0.009) indicating measurement equivalence. Since M5 met the minimum level of measurement invariance required to proceed to second order modeling (Thompson & Green, 2006), fitting

Table 2
Longitudinal correlation patterns among indicators (subdomain manifest variables) of Parenting Stress.

	Parental Distress				Parent-Child Dysfunction				Difficult Child			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
Parental Distress												
T1												
T2	0.60	--										
T3	0.50	0.59	--									
T4	0.48	0.52	0.55	--								
Parent-Child Dysfunctional Interaction												
T1	**0.48**	0.32	0.29	0.23								
T2	0.40	**0.53**	0.38	0.39	0.61	--						
T3	0.34	0.38	**0.58**	0.36	0.55	0.58		--				
T4	0.33	0.38	0.32	**0.56**	0.46	0.57	0.52	--				
Difficult Child												
T1	**0.40**	0.34	0.33	0.23	**0.65**	0.42	0.47	0.33				
T2	0.37	**0.53**	0.39	0.35	0.34	**0.63**	0.49	0.36	0.50	--		
T3	0.40	0.39	**0.58**	0.38	0.33	0.42	**0.65**	0.37	0.47	0.54	--	
T4	0.43	0.41	0.44	**0.61**	0.24	0.40	0.36	**0.57**	0.33	0.50	0.57	--

Notes: Parenting Distress, Parent-Child Dysfunction and Difficult Child are subcomponents of the composite measure Parenting Stress. The shaded figures indicate correlations among stress indicators over time. The bold numbers indicate correlations among different indicators of parenting stress at the same times measurement.

Table 3
Model fit statistics.

	$\chi^2(df)$	Model Comparison	$\Delta\chi^2(df)$	CFI	ΔCFI	RMSEA (90% CI)	SRMR	BIC
Null model (no autocorrelated errors) (M1)	541.805 (55)	–	–	0.796	–	0.131 (0.121, 0.141)	0.083	29789.965
Configural LCFA model (with autocorrelations) (M2)	30.269 (25)	M2 vs M1	32.767 (5)	0.998	0.012	0.020 (0.000, 0.043)	0.028	29465.755
LCFA with weak invariance (M3)	46.312 (31)	M3 v M2	16.04 (6)	0.994	0.004	0.031 (0.008, 0.049)	0.045	29444.332
LCFA with strong invariance (M4)	201.120 (37)	M4 v M3	154.81 (6)	0.931	0.063	0.093 (0.080, 0.106)	0.064	29561.675
LCFA with strong partial invariance (M5)	77.547 (41)	M5 v M3	31.24 (10)	0.985	0.009	0.042 (0.027, 0.056)	0.054	29257.591
LCFA with strict invariance (M6)	92.190 (41)	M6 v M5	39.86 (9)	0.979	0.021	0.049 (0.036, 0.063)	0.077	29427.769
Linear CFM (M7)	80.465 (37)	–	–	0.982	–	0.048 (0.033, 0.062)	0.049	29441.021
Quadratic CFM (M8)	60.154 (36)	M8 v M7	20.311(1)	0.990	0.008	0.036 (0.019, 0.052)	0.050	29426.954

Notes: LCFA = Longitudinal Confirmatory Factor Analysis; CFM = Curve of Factors Model; CFI = Comparative Fit Index; RMSEA = Root mean square error of approximation; SRMR = Standardized Root Mean Square Residual; CI = Confidence Interval; *df* = Degrees of Freedom; and BIC = Bayesian Information Criterion.

a curve of factor model was deemed appropriate.

8.4. Second order latent growth curve model

A second-order growth curve model was specified to reflect the trajectory of parenting stress over three years. Latent parenting stress variables were generated at each wave and modeled as a growth curve (i.e., intercept and slope) to describe growth in the latent construct of parenting stress across time. A comparison of the linear CFM ($\chi^2(df) = 83.47(37)$, $p < .01$; CFI = 0.982; RMSEA = 0.048; SRMR = 0.049) with the quadratic CFM ($\chi^2(df) = 20.31(36)$, $p < .01$; CFI = 0.990; RMSEA = 0.036; SRMR = 0.050) revealed that the latter provided a better fit to the data and was retained (see Table 3).

Overall, the second order growth factors accounted for between 59.5% and 69.4% of the variance in the latent global variable measuring PS. In addition, the reliabilities of the observed variables were high, ranging from 0.648 to 0.793. Statistically significant mean levels existed for the intercept, slope and quadratic term of the second-order model, indicating an initial level of parenting stress that is greater than 0 and an increasing trend in parenting stress over time (intercept = 21.12, p < .001; slope = 3.901, p < .001; quadratic = -0.585, p < .001). Inter-individual variation within the second-order intercept (initial level) (intercept = 19.9, p < .001) and in the rate of change over time (slope = 3.04, p < .001) was present. This means that some mothers had both higher levels of postpartum parenting stress and showed greater increases in parenting stress over time. The negative covariance between the intercept and slope suggests that individuals with higher initial scores increase less rapidly over time compared to individuals experiencing lower initial levels (cov = -1.471, $p = .09$). Allowing the slope and intercept factors to covary accommodates the realistic possibility that mothers' parenting stress development over time is related to their initial level of parenting stress postpartum. Therefore, this finding is driven, in part, by the fact that mothers who start with high levels of parenting stress have less room to grow over time. This result is not surprising because individuals who start with a higher intercept have less room to grow overtime.

8.5. Parenting stress, cognitive readiness to parent, and child social-emotional competence

The model was extended to include three measures of cognitive readiness to parent, social support and adverse life events as well as maternal age, education, race, marital status and receipt of welfare benefits. In addition, the model was extended to include initial level and slope of parenting stress as a predictor of CAPI score (i.e. unhappiness subscale) and child behavioral outcomes at age 3 (Fig. 1). All variables in the model were mean centered. Table 4 shows the results of this model (labeled Model 1 in the table). As shown in Table 4, both maternal responsivity-empathy ($\beta = -0.424$, $p < .001$) and parental self-efficacy ($\beta = -0.154$, $p < .001$) were negatively associated with initial levels of parenting stress. Model 2 includes an interaction term between social support and each measure of cognitive readiness to parent. In this model, both responsivity-empathy and parental self-efficacy remain significant. In this model, the number of difficult life circumstances became statistically significant and positively associated with initial levels of parenting stress ($\beta = 0.374$, $p < .001$). Results

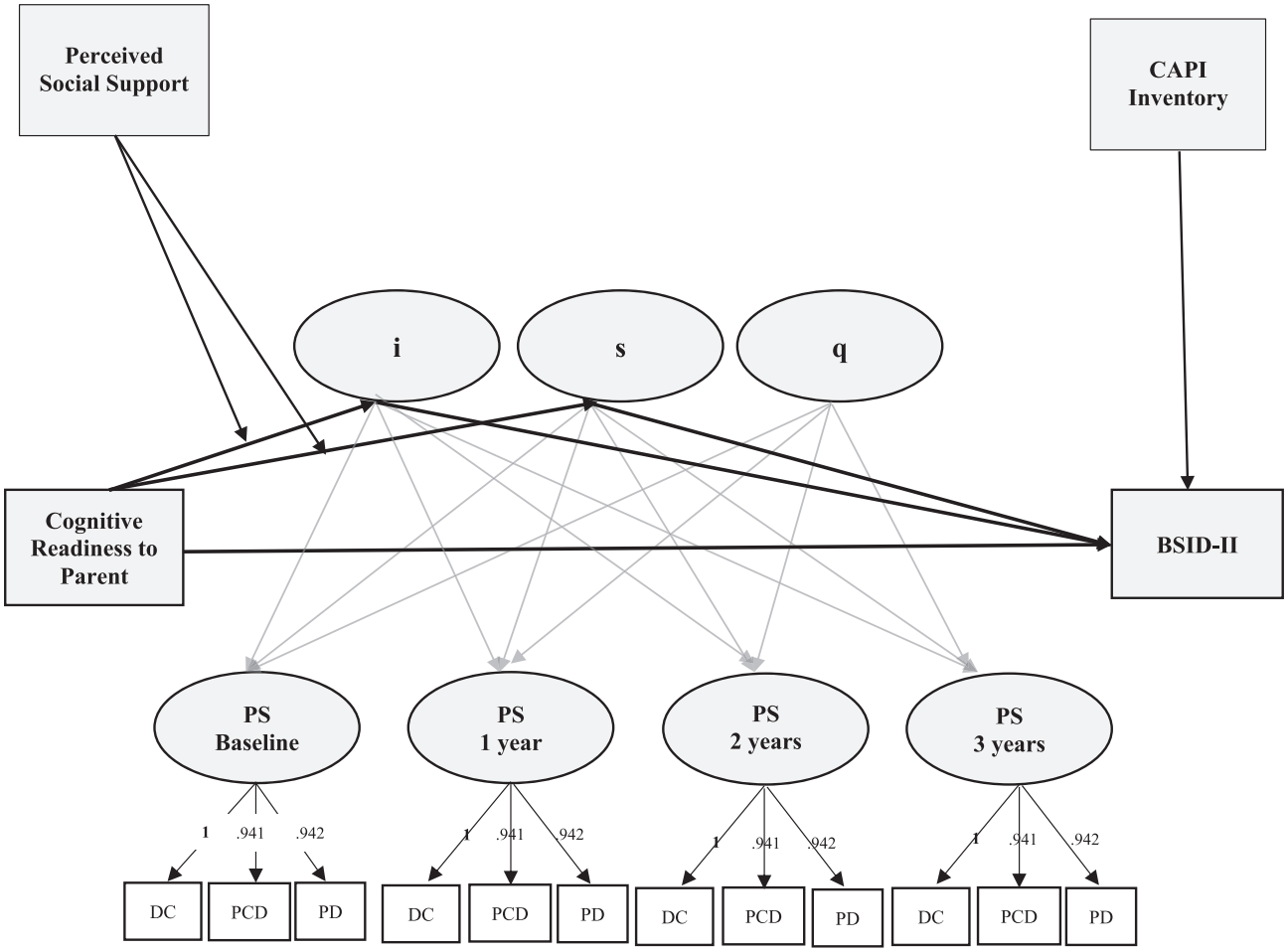

Fig. 1. Structural equation model including a second order linear growth curve for parenting stress (PS) symptoms. All coefficients are unstandardized parameter estimates based on maximum likelihood estimation. parenting stress = Parenting Stress; DC = Difficult Child; PCD = Parent-Child Dysfunction; PD = Parental Distress; i = Intercept; s = Slope; q = Quadratic. Autocorrelation between parenting stress factors and growth factor covariances were included in the model. Partial strong variance was specified under the marker variable approach. Bolded values indicate fixed parameters. Additional variables included in the model are social support, difficult life circumstances, maternal age, marital status, race/ethnicity, receipt of welfare benefits and education. Three measures of cognitive readiness to parent are hypothesized to be positively related to initial levels of parenting stress (intercept) and change (increases) in parenting stress (slope) over time. In turn, parenting stress growth factors (intercept and slope) are hypothesized to predict lower levels of social-emotional competence among children at age 3. In this model, parenting stress mediates the relation between cognitive readiness to parent and future social-emotional competences in children.

further demonstrated that perceived social support moderates the impact of both maternal-empathy and parental self-efficacy on growth in parenting stress over time. Finally, initial level of parenting stress was significantly and positively associated with child abuse potential ($\beta = 1.253$, $p < .001$) and significantly but inversely related to child behavioral outcomes at age 3 ($\beta = -5.986$, $p = .031$). This means that growth in parenting stress is related to higher levels of child abuse potential (measured using the unhappiness scale) and that mothers who have higher initial levels of parenting stress had children with less social-emotional competence at age 3. Demographic variables were differentially predictive of cognitive readiness to parent. Maternal education predicted higher levels of empathy-responsivity (ß = 0.691, $p < 0.001$) and parental self-efficacy (ß = 1.62, $p < 0.001$). Mothers without a partner reported less parenting self-efficacy (ß = −3.914, $p < 0.045$) and white mothers reported more knowledge of infant development (ß = 6. 97, $p < 0.001$).

9. Discussion

Previous research has demonstrated that high levels of parenting stress and lack of cognitive 'readiness to parent' (Sommer et al., 1993) are related to the development of behavior problems in small children. Less clear is whether postpartum parenting stress provides a mechanism through which lack of cognitive readiness to parent predicts early child behavioral problems. Using prospective data over a 3-year period collected from a sample of 682 new mothers, this study provides new insights into the associations between stability and change in parenting stress, cognitive readiness to parent, and externalizing child behavior. In this study, cognitive readiness to parent describes a parents' prospective ability to identify with the needs of her child, the inability of which was hypothesized to be related to both initial level and change in postpartum parenting stress from birth through age 3. Findings indicated that two measures of cognitive readiness to parent were significantly associated with parenting stress 6 months following childbirth. Finally, social support moderated the relation between two of the three measures of cognitive readiness to parent and parenting stress. Each of these findings and their implications are elaborated upon below.

The first empirical inquiry was to investigate the longitudinal confirmatory factor structure of postpartum parenting stress in new mothers from birth through age three. The LCFA revealed the presence of both cross-sectional and longitudinal associations among the three subdomains of parenting stress (i.e., child distress, parent-child dysfunction, and parenting distress) which was attributed to a global,

Table 4
Results of the curve of factors model (N = 289).

	PS intercept	PS slope	CAPI	BSID-II
Model 1				
KIDI	−0.033(0.055)	0.002(0.028)		
Responsivity	−0.424(0.074)***	0.038(0.279)		
PSE	−0.154(0.025)***	−0.001(0.012)		
Adverse Life Events Scale	0.198(0.163)	0.065(0.077)		
Social Support Index	−0.047(0.121)	0.057(0.042)		
Model 2				
KIDI	0.005(0.052)	−0.002(0.027)		
Responsivity	−0.387(0.075)***	0.020(0.037)		
PSE	−0.162(0.021)***	0.002(0.012)		
Adverse Life Events Scale	0.374(0.173)**	0.015(0.089)		
Social Support Index	−0.073(0.105)	0.027(0.055)		
PSE × Social Support	0.020(0.014)	−0.014(0.008)*		
KIDI × Social Support	0.009(0.029)	−0.015(0.022)		
Resp × Social Support	−0.006(0.027)	−0.035(0.026)**		
CAPI				0.438(0.490)
PS intercept			1.253(0.203)***	−0.077(0.646)
PS Slope			0.713(1.10)	−5.986 (2.736)**

Notes: All variables were Grand Mean Centered. KIDI = Knowledge of Infant Development Index; PSE = Parenting Self-Efficacy; CAPI = Child Abuse Potential Inventory; PS = Parenting Stress; BSID-II = Bayley Scales of Infant Development; Model controlled for maternal education, maternal age, welfare receipt; marital status (=partnered/unpartnered) and race (=white/non-white).
$p < .001$; **$p < .05$; *$p < .10$.

latent factor thereof. Practically speaking, this means that child and parenting distress and parent-child dysfunction, while generally considered to be independent but co-occurring problems, in reality are symptoms of a single, underlying latent construct of parenting stress (Eaton, Rodriguez-Seijas, Carragher, & Krueger, 2015). This finding is consistent with previous research showing that maternal stress accumulates across different child developmental periods and that the accumulation of stress, in turn, increases the risk of poor outcomes for both children and parents (Crnic et al., 2005). In the present study, the observed comorbidity among the three parenting stress subdomains may be symptomatic of postpartum mothers' undifferentiated accumulation of stress over time (Lilienfeld, 2003) or to a shared vulnerability, common among new mother, to experience relatively higher levels of stress compared to the general population (Krueger, Caspi, Moffitt, & Silva, 1998). As with previous research, this study confirms that parenting stress is neither unidimensional nor unchanging. Interventions designed at minimizing stress in the parental role should acknowledge the cumulative nature of chronic stress that arise from different sources across different transactional contexts.

The next goal of this study inquired about the presence of change or stability in parenting stress among new, first-time mothers. Overall, results from the second order growth curve model supported the hypothesis that following birth, mothers exhibit relatively high parenting stress levels overall and that (global) postpartum parenting stress increases over time although no mediating effect was uncovered. Additionally, the analysis revealed inter-individual differences in both initial levels and growth in parenting stress among new first-time mothers; in other words, mothers varied from one another in both their initial level and rate of change in parenting stress from infancy to early childhood. This finding is in contradistinction to research conducted by Williford et al. (2007) who found that maternal parenting stress decreased over time. The divergence in findings between the two studies is likely explained by methodological considerations and key differences between analytical samples. Unlike the present study which examined parenting stress from 6 to 36 months following childbirth, Williford et al. examined stability and change in parenting stress among mothers with children between the ages of 2–5 who were at risk for externalizing behavior problems. Whereas Williford et al. (2007) used the Parenting Stress Index – Short Form, similar to the present study, their assessment of overall maternal parenting stress was based on the total stress raw score, which is an additive index that combines scores across three subdomains. In the present study, factor analytic techniques described variability among the observed, correlated subdomains of parenting stress and then second order intercept and slope factors were used to measure initial level and change in the multiple indicators of latent parenting stress at each time point. Another possible reason for the discrepancy across studies pertains to the nature of the samples. In the present study, the participants were disproportionately young, black and low income; hence, they were relatively more disadvantaged compared to the typical new mother. On the other hand, the results of this study are congruent with previous research using at risk samples. For example, studies have shown that adolescent mothers and African American mothers have an at increased risk of experiencing parenting stress and experience higher levels of parenting stress for years following childbirth (Spencer, Kalil, Larson, Spieker, & Gilchrist, 2002; Emery, Paquette, & Bigras, 2008). Since understanding and explaining the variability in the rate of change of postpartum parenting stress has important implications for both women and children, future research should continue to investigate stability and change in parenting stress as well as potential population subgroups of at risk mothers with unique parenting stress trajectories.

9.1. Cognitive readiness to parent and parenting stress

A third goal of this study was to explore the role of cognitive readiness to parent at baseline in predicting both the level and change in postpartum parenting stress over a three-year period. In the present study, cognitive readiness to parent was operationalized multidimensionally to include measures tapping mothers' knowledge about child development, responsiveness to children's needs and level of competence in the parenting role. Consistent with previous research in which 'lack of cognitive readiness' to parent was related to higher levels of parenting stress (Miller, Miceli, Whitman, & Borkowski, 1996; O'Callaghan, Borkowski, Whitman, Maxwell, & Keogh, 1999; Sommer et al., 1993; Chang et al., 2004), in the present study, two measures of cognitive readiness to parent predicted lower initial levels of parenting stress, as hypothesized. No measure of cognitive readiness to parent predicted growth in parenting stress over time. Nevertheless, the study findings support the assertion that mothers who lack cognitive readiness to parent are less vulnerable to manifestations of accumulative parenting stress in the presence of social support networks. In other words, mothers who were less cognitively ready to parent but who had

higher levels of social support demonstrated slower rates of change in postpartum parenting stress. As with many studies before this one, the present findings highlight the critical role of social support in minimizing growth in postpartum parenting stress among new mothers who have less parenting self-efficacy and demonstrate less empathetic understanding of their children's needs (Huang, Roberts, Costeines, & Kaufman, 2019). In addition, results from this study suggest that in addition to increasing parenting self-efficacy and responsivity-empathy to children's needs, minimizing the impact of difficult life circumstances (e.g. landlord-tenant problems, lack of affordable housing, experiencing a major illness and/or being the victim of a crime) are critical for reducing postpartum parenting stress in first-time mothers above and beyond other factors. Finally, consistent with previous research, in this study being non-white, having less education, and receiving welfare benefits were differentially related to dimensions of readiness to parent consistent with previous research. Therefore, less educated, minority and low-income mothers would accrue additional benefits from interventions designed to minimize parenting stress by providing them with critical resources necessary to minimize it.

9.2. Parenting stress and social-emotional competence in children

The present study found that part of the contribution that lack of maternal readiness to parent has towards influencing poor behavioral outcomes in children is exerted through relatively higher initial levels of parenting stress. More specifically, initial level of parenting stress was related to child abuse potential and growth in parenting stress predicted lower social-emotional competence in children. Child abuse potential did not predict lower social-emotional competence in children, however, controlling for parenting stress. This contrasts with previous research linking parenting stress to poor child behavior through the adoption of ineffective (e.g. harsh, inconsistent and/or abusive) parenting practices and/or the provision of maladaptive models of prosocial functioning (Rubin, Hastings, Chen, Stewart, & McNichol, 1998). The question remains, "how does the child know the parent is stressed?" It is possible that stress is exerted vicariously through parent-child interaction, or that stress is exerted through parent or child behaviors or characteristics that were not included in this study. Future research would benefit from incorporating additional parent and child characteristics as moderating factors of the association between parenting stress and future behavioral problems. It is worth noting, however, that this study highlights the critical role of social support as a protective factor that minimizes negative outcomes for both mothers *and* their children and that increasing socio-emotional competence in children depends, in part, on promoting the well-being of mothers by reducing maternal levels of parenting stress.

9.3. Implications for interventions

Parenting stress may result from vulnerabilities experienced by mothers before becoming a parent. Therefore, measures that minimize parenting stress help facilitate mothers' adjustment to the parenting role, for example, helping mothers understand best practices for dealing with a 'difficult' child, teaching them strategies that reduce conflict or dysfunction in relationships, or increasing the availability of familial resources. Evidence-based interventions that focus on increasing parents' knowledge of early childhood development and improving practices and orientations around parenting infants, such as the Nurse-Family Partnerships (NFP) program and Parents as Teachers Evidence-Based Home Visiting program, are critical sources of support for new mothers and their young children. Both programs are community-based home visiting programs focused on promoting the health, well-being, and self-sufficiency of families (Nurse Family Partnership, 2018). Both programs help new mothers adjust to the parenting role by increasing their knowledge of age-appropriate child development, including language, cognitive, social-emotional and motor domains, and by promoting positive parenting skills and quality parent-child interactions (Parents as Teachers, 2020). Nevertheless, program participation is targeted to children and families that meet certain eligibility requirements (e.g. receipt of Temporary Aid for Needy Families, TANF, first-time parents) which reduces the ability of these programs and others like them to reach more families experiencing parenting stress. By eliminating eligibility requirements, the benefits of these programs will be more accessible to mothers who lack social support and/or who are experiencing difficult life circumstances regardless of their level of income, education, how many children they have or where they reside.

9.4. Strengths and limitations

A major strength of this study is the use of a second-order growth mixture model that is flexible in assessing a wide variety and types of linear and nonlinear change, able to incorporate multivariate measures and increase statistical power (Ram & Grimm, 2007, 2009). Despite the strengths of this study, however, it is not without limitations. The parenting variables were measured using maternal self-report and hence provide only subjective assessments based on the perception of the respondent. As with all self-reported measurements, these variables may be biased due to lack of memory and recall. To minimize problems of subjectivity, child behavior problems were measured objectively using an exogenous variable that was based on the assessment of qualified professionals and not maternal report (e.g., Östberg & Hagekull, 2000). As with all longitudinal studies, attrition was observed in this study. To accommodate missingness in the data, maximum likelihood estimation is the recommended approach for data missing at random and therefore was used in this study. This assumption may be violated if data are not missing completely at random. In addition, this study used a time invariant measure of cognitive readiness to parent. Some measures of cognitive readiness to parent may be more dynamic and change over time depending on children's' developmental levels and demands (Bandura, 1989). If so, the impact of these variables may be different during different developmental periods. Future research should incorporate time-varying predictors into a COFM to explore stability and change in parenting stress in relation to changes in cognitive readiness to parent.

The modeling strategy used here assumes that all mothers followed a single trajectory. However, it may be possible to identify subgroups of mothers characterized by increasing trajectories of parenting stress over time. If the assumption that these subgroups do not all follow the same parenting stress trajectories is false, then one or more may have a different growth curve and these differential trajectories may have different implications for child adjustment patterns. Therefore, future analyses would benefit from an examination of heterogeneity in parenting stress, particularly in high risk groups. Examples of subgroups to focus on are teenage mothers versus older mothers, mothers with a history of traumatic experiences and/or abusive/neglectful mothers. Finally, even though socio-emotional problems were measured at a very early age, no causal attributions can be made despite the strengths associated with the current longitudinal design, so the direction of the relations between cognitive readiness to parent, parenting stress and future child behavior, despite their strong associations, remain unknown.

10. Conclusion

In conclusion, the present analysis explored four-waves of parenting stress among new postpartum mothers, focusing cognitive readiness to parent and future child behavior, and adopted a statistical approach that is well-suited for developmental studies because of its ability to model long-term changes in parenting stress over time. This study advances current knowledge about the relation between cognitive readiness to parent and parenting stress by identifying the former as a key driver predicting initial levels of postpartum parenting stress and the

important factors that moderate its effect over time. Modeling the longitudinal parenting stress symptoms as one latent trajectory yielded findings that shed light on the growth of parenting stress, addressed the consequences for children who develop externalizing symptoms early in life, and may continue to experience adverse psychosocial sequelae across the lifespan.

11. Author statement

I am solely responsible for the conceptualization, analyses, methodology, and writing of this manuscript. I would like to thank the National Data Archive on Child Abuse and Neglect (NDACAN) for making these data available.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2020.104958.

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