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Reciprocal Influences Between Maternal Parenting and Child Adjustment in a High-risk Population: A Five-Year Cross-Lagged Analysis of Bidirectional Effects

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Abstract

This study examines longitudinally the bidirectional influences between maternal parenting (behaviors and parenting stress) and mothers' perceptions of their children's adjustment, in a multivariate approach. Data was gathered from 361 low-income mothers (many with psychiatric diagnoses) reporting on their parenting behavior, parenting stress and their child's adjustment, in a two-wave longitudinal study over 5 years. Measurement models were developed to derive four broad parenting constructs (Involvement, Control, Rejection, and Stress) and three child adjustment constructs (Internalizing problems, Externalizing problems, and Social competence). After measurement invariance of these constructs was confirmed across relevant groups and over time, both measurement models were integrated in a single crossed-lagged regression analysis of latent constructs. Multiple reciprocal influence were observed between parenting and perceived child adjustment over time: Externalizing and internalizing problems in children were predicted by baseline maternal parenting behaviors, while child social competence was found to reduce parental stress and increase parental involvement and appropriate monitoring. These findings on the motherhood experience are discussed in light of recent research efforts to understand mother-child bi-directional influences, and their potential for practical applications.

Motherhood is an extremely challenging and demanding life-role, yet we know little about what shapes women's stress and efficacy as parents. The developmental literature is replete with studies of how children's perceptions of their parents shape their own adjustment, but fewer studies have examined the reverse association, that is, how mothers' feelings about their children's adjustment might affect their own well-being. Such investigation is especially important among vulnerable mothers for whom the child's adjustment may be a source of increased distress, or conversely, a factor contributing to improved well-being and

adaptive parenting behaviors. In this study of a group of high-risk mother-child dyads (e.g., mothers living in poverty and/or struggling with substance abuse or dependence disorders), we used a five-year two-wave longitudinal design to examine cross-lagged associations between critical aspects of both motherhood and child adjustment.

Phenomenological Experiences of Mothers

The study of motherhood in relation to child adjustment represents a long tradition of research in developmental psychology. Many have conceptualized child adjustment as the product or consequence of family processes, in particular, of mothering dimensions such as levels of warmth or rejection displayed, and effectiveness of limit-setting (e.g., Egeland, Carlson, & Sroufe, 1993; Wyman et al, 1999). However, mothers' feelings of well-being are rarely considered as a dependent variable. We still know surprisingly little about what helps mothers to feel positive and efficacious, as opposed to overwhelmed and depleted, in their role as parents (Luthar, Crossman, & Small, in press).

Focus on such “reciprocal” influences between both children's and parents' adjustment has emerged only recently in the literature (e.g., Carrasco, Holgado, Rodríguez, & del Barrio, 2009; Gault-Sherman, 2012; Williams & Steinberg, 2011), but the need to disentangle predictors of mothers' functioning has been outlined in decades of resilience literature. Research in this area has shown that for children facing high-risk conditions, the single most important protective factor is having a strong, supportive relationship with a primary caregiver – in most instances, the mother (Luthar et al., in press; Luthar & Zelazo, 2003; Wyman et al., 1999). Due to the importance of the mother-child relationship, it is critical to better understand what makes mothers feel relatively positive and, conversely, relatively negative in their roles as parents.

The need for such exploration is particularly important among families raising children in the context of the major stressors of poverty and maternal psychological maladjustment, and in such settings, studies have suggested that mothers' feelings of connectedness with others can be a critical protective factor. For example, intervention studies of low-income mothers with substance abuse disorders have shown improvements in functioning among women participating in relationally-oriented psychotherapy groups, with a central aim of promoting positive, close relationships with others (Luthar & Suchman, 2000; Luthar et al., 2007). Mothers reported improvement not only in their own functioning, but also in that of their children; and their children (never seen in therapy) similarly reported improvement in parenting behaviors, and tended to show a better psychological adjustment (see also Gunlicks & Weissman, 2008).

Mothers' relationships with their children are among the most central of the proximal, intimate connections in their lives, and their own well-being is likely to be shaped by perceptions of their children's adaptation and behavior. Recent research efforts to explore these bidirectional influences reveal not only that negative parenting predicts externalizing problems in children, but also that children's externalizing problems predict future parental hostility, low warmth, and maternal distress (Allen, Manning, & Meyer, 2010; Carrasco et al., 2009; Hipwell et al., 2008; Lorber & Egeland, 2011; Williams & Steinberg, 2011). In

similar fashion, internalizing problems in children have been demonstrated to predict future low parental warmth and parental over-involvement (Hipwell et al., 2008; Moberg, Lichtenstein, Forsman, & Larsson, 2011). There is also evidence that higher levels of parental monitoring (i.e., behavioral control) predict more problem behavior and lower social competence in children, while problematic child behavior predicts a decrease in parental monitoring (Williams & Steinberg, 2011). In this study, we attempt to extend this important line of research by considering bi-directional associations in mothers' perceptions of their children's adaptive functioning, and of their own functioning as parents, using a five-year span longitudinal design and a sample of high-risk low-income women.

Operationalization of Constructs

Among dimensions of motherhood, we first considered maternal stress given its significance for women's overall psychological adjustment (Deater-Deckard, 1998) as well as for their behaviors in everyday life. Studies have shown that stress exacerbates depression, anxiety, and even physiological problems (e.g., Grippo & Johnson, 2009). Adverse effects on parenting behaviors and child outcomes are equally well-established (Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Suchman & Luthar, 2001; Supkoff, Puig, & Sroufe, 2012). We also consider mothers' feelings of effectiveness as parents, along two major parenting dimensions of support versus rejecting behavior, and appropriate control or limit-setting (e.g., Amato, 1990; Baumrind, 1989; Suchman, Rounsaville, DeCoste, & Luthar, 2007). Parental support, or warmth, entails the provision of a safe and nurturing environment that facilitates a child's exploration of new physical, cognitive, and social potential, with high parental sensitivity and responsiveness to the child's needs (Baumrind, 1989; de Haan, 2012). Low levels of parental support are associated with poor outcomes in child functioning, with up to 26 percent of the variability in children's psychological maladjustment accounted for by parental rejection (Khaleque & Rohner, 2002; Rohner, Khaleque, & Cournoyer, 2005). Similarly, some have found the absence of warmth, permissiveness and over-involvement to be associated with children's internalizing symptoms (Chen, Liu, & Li, 2000; Hipwell et al., 2008; Moberg et al., 2011; Williams & Steinberg, 2011). On the negative end of the support dimension, parental hostility, rejection, and neglect have been shown in meta-analyses to demonstrate a moderate, positive association with children's delinquent behaviors (Hoeve et al., 2009).

Parental control, also referred to as behavioral control, is another dimension of parenting that has long been related to specific aspects of child adjustment. Broadly described as supervision and limit setting (Amato, 1990), this construct consistently shows negative moderate associations with externalizing problems in children (for a meta-analysis, see Hoeve et al., 2009). Isolated results also outline the positive effect of parental control on decreased internalizing problems (Caron, Weiss, Harris, & Catron, 2006), as well as improved interpersonal social competence in children (Barber & Erickson, 2001). However, the reciprocal relation—that is, the effect of child adjustment on parental control—is less established in the literature (Williams & Steinberg, 2011), and is therefore a dimension of interest in this study.

With regard to mothers' perceptions of their children's adjustment, we examined maternal ratings of not only offspring's psychological symptoms (internalizing and externalizing problems), but also social competence. The need to consider separately dimensions of child psychopathology and social competence is amply clear from the literature on resilience (see Luthar, 2006; Masten, 2011). Multiple studies have shown that at-risk children can function very effectively in one arena – e.g., showing leadership with peers – while, at the same time, having considerable difficulty in others – such as internalizing symptoms. In terms of ramifications for mothers, it has been established that disturbances in child functioning, particularly externalizing symptoms, can cause increasing distress to parents (Moberg et al., 2011). What has yet to be examined to date is whether there are equally salutary effects associated with children's social competence. In other words, it is unclear whether perceptions of children being well-adjusted with peers and other adults might lead mothers to feel increasingly positive and efficacious in their own role as parents.

Hence, the aim of this study was to evaluate the bi-directional associations between mothers' perceptions of their children and their own adjustment, simultaneously incorporating multiple dimensions of both child and parent functioning, modeled as Latent Variables (LVs) in the Structural Equation Modeling framework (SEM). This highly robust and flexible analytic approach was used in order to examine cross-lagged associations between mother's perceptions of their children's (a) Internalizing problems, (b) Externalizing problems, and (c) Social competence, in relation to mothers' feelings in the parenting role using four broad and universal dimensions of parenting: (a) Stress, (b) Involvement or support, (c) Rejection, and (d) Behavioral Control. Beyond expected cross-sectional associations between constructs (e.g., parental rejection associated with higher level of externalizing problems) already well-established in the developmental literature, we hypothesized that mothers' perception of their children's adjustment will influence their own parental stress and feelings in the parenting role over the relatively long period of five years. Specifically, we anticipated that perceived children's Internalizing and Externalizing problems at baseline will be significant long-term predictors of increased maternal Stress at follow-up. Conversely, we hypothesized that children's Social competence at baseline will be associated with decreased maternal Stress and maladaptive parenting behavior at follow-up.

Method

Participants

This study comprises a secondary data analysis from a three-wave longitudinal research program involving a sample of mothers and their school-age and adolescent children followed-up over ten years (e.g., Barbot, Hunter, Grigorenko, & Luthar, 2013; Luthar & Sexton, 2007; Yoo, Brown, & Luthar, 2009). Only the two first waves of data collection were retained for this study, as all the children were adult (typically, not living with their mother) at the last measurement occasion. The original study was designed to investigate factors of resilience and vulnerability among children of mothers with substance abuse and/or affective and anxiety disorders (see Luthar & Sexton, 2007, for an overview). Women were recruited from three settings in an urban area of Connecticut: the general

community (e.g., public bulletin boards), an urban community mental health center, and an urban methadone clinic. All mothers who expressed interest in participation were screened to determine eligibility for the main research program (Luthar & Sexton, 2007). Per the study's inclusion criteria, women with a history of psychosis or under antipsychotic medications were excluded; eligible dyads consisted of a mother and her cohabitating, biological child between 8 and 17 years of age and for whom the mother was the child's legal guardian.

Ultimately, 361 eligible low-income mothers provided informed consent and enrolled in the study (Time 1, T1). Over 70% of the dyads were living below the federal poverty threshold at time of recruitment. Mother's age ranged from 23.5 to 55.8 ($M_{age} = 38.2$ years, $SD = 6.2$) and their target children were 54% girls ($M_{age} = 12.7$, $SD = 2.9$), and 46% boys ($M_{age} = 12.3$, $SD = 2.7$). Self-reported ethnicities were as follows: African-American (51.5%), Caucasian (34.2%), Hispanic (6.3%), Native American (.8%), Asian (.3%), Mixed (5%) and not-reported (2%). Among mothers, the lifetime-prevalence of substance use disorder alone was 19%, affective/anxiety disorder alone was 20%, co-morbid substance use disorder and affective/anxiety disorder was 26% and 35% of the sample had no history of either.

Measures

Parental constructs—Three parenting instruments were used to capture four broad categories of mothers' perceptions of their parenting behavior and related stress.

The *Parental Acceptance–Rejection Questionnaire* (PARQ; Rohner, Saavedra, & Granum, 1991) is a 60-item questionnaire rated on a 4-point scale, including four subscales: the *Warmth/Affection* subscale that refers to the quality of the mother-child affectionate relationship, and three dimensions of maladaptive parenting: *Aggression/Hostility* (harsh verbal interactions and physical abuse), *Neglect/Indifference* (lack of attention to the child's needs), and *Undifferentiated Rejection* (withdrawal of love without reflecting either aggression/hostility or neglect/indifference). Research with this instrument over three decades has demonstrated PARQ's strong psychometric properties (e.g., Kourkoutas & Erkman, 2011).

The *Parent–Child Relationship Inventory* (PCRI; Gerard, 1994) is a 78-item maternal self-report measure rated on a four-point Likert-scale. It includes seven subscales, four of which pertain to parent-child interaction: *Communication*, *Involvement*, *Limit Setting* and *Autonomy*. In this study, only these four scales were used to capture (a) a Parental Control dimension (see Suchman et al., 2007) represented by the *Limit Setting* scale (provision of appropriate discipline) and the *Autonomy* scale (promotion of child's independence), and (b) a Parental Involvement dimension including the *Communication* scale (capacity to talk and empathize with children) and the *Involvement* scale (measuring interest shown in child's activities). The PCRI has demonstrated adequate psychometric properties (Coffman, Guerin, & Gottfried, 2006) including with samples of women who are of low socioeconomic status (SES) and have histories of drug abuse (Luthar & Sexton, 2007).

Finally, we used the Parenting Stress Index – Short Form (PSI-SF; Abidin, 1995), a 36-item self-report measure of parenting stress, rated using a 5-point Likert-scale. The measure

yields a total stress score from three subscales including (a) Child-focused stress, or the degree to which parents are bothered by behavioral characteristics of their children that make them difficult to manage, (b) Parent–Child dysfunctional interaction, or the degree to which parents are unsatisfied with their children's abilities to meet their expectations, and (c) Parent factors, or distress that parents experience as a function of personal factors that are directly related to parenting. Extensive research demonstrates excellent psychometric properties of this instrument across samples of different cultures (e.g., Haskett, Ahern, Ward, & Allaire, 2006; Yeh, Chen, Li, & Chuang, 2001), including among mothers with substance use disorders (Suchman & Luthar, 2001) and mothers of low SES (Reitman et al., 2001).

Child adjustment measure—The Behavior Assessment System for Children (BASC, Reynolds & Kamphaus, 1998) is a multidimensional assessment of children's adjustment. The Parent Rating Scale (PRS) portion was used in this study to capture mothers' perceptions of child adjustment. Three PRS forms are available to account for age-appropriate content; two of them, the child form (PRS-C; 138 items) and adolescent form (PRS-A; 126 items), were used in the current study. However, because PRS-C and PRS-A items content do not perfectly overlap, investigations of mean differences across age-groups or over time are challenged by the presence of non-common items. Hence only common items between the two forms (85 items) were used following a “Comparable Scale Scoring (CSS)” method (Barbot, Hein, Luthar & Grigorenko, in press). This method has shown to yield scores with sufficient level of measurement invariance for a robust estimation of age-group differences and intra-individual change, as compared to the original PRS-C and PRS-A scores, which hold only weak measurement invariance, leading to flawed developmental inferences (Barbot et al., in press). Accordingly, eleven PRS scales were used in this study including nine clinical scales – *Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Somatization, and Withdrawal* – and two adaptive scales, *Leadership, and Social Skills*. Extensive literature exists on the excellent psychometric properties of the BASC-PRS (e.g., Reynolds & Kamphaus, 1998; Rosemary, 1995).

Procedure

All mothers (N = 361) were seen for the first measurement occasion (T1) between 1996 and 2000 (a time window reflecting the difficulties in enrolling such a large sample of vulnerable mother-child dyads). After an average of 5 years (60 months) later (between 2001 and 2005), 78% of mothers (n = 281) returned for a follow-up measurement occasion (Time 2, T2). As previously noted, Time 3 data (T3) were not included in the present study since all child participants were then adults. At both T1 and T2, interviews and self-report measures were conducted or supervised by trained interviewers. All parenting measures were administered across measurement occasions, while the BASC-PRS focused on mothers with a child under the age of 18 (in accordance with the BASC administration instructions). Consequently, the BASC-PRS was administered to all mothers at T1 and to 54% of the returning mothers at T2 (n = 151, with 75 mothers of boys, and 76 mothers of girls); the remaining 46 % of the returning mothers at T2 (n = 130) having children over 18 years old at time of interview. Hence, the resulting patterns of missing data from the attrition and

selection processes were carefully examined in view of planned analyses (see Data Analyses section). Participants received financial compensation for their participation upon completion of measures at each interview. The original research protocol (which included the potential for secondary data analyses such as in the present study) was reviewed and approved by the Yale University Institutional Review Board.

Data Analyses

After a series of preliminary analyses examining the distributional features and reliability estimates of the variables used in this study, a set of measurement models were developed and then integrated within the Structural Equation Modeling (SEM) framework. This framework was chosen in order to (a) model Latent Variables (LVs) of interest, free of measurement error, which accounted for considerable conceptual and empirical overlap between multiple indicators of the same underlying construct (e.g., Parent hostility and Parental rejection are conceptually and empirically related to an underlying LV that can be estimated with SEM) ; and (b) to estimate equivalence of measurement over time (measurement invariance testing), a basic condition to ascertain that LVs have the same substantive meaning at each measurement occasion, and ultimately, to interpret meaningfully cross-sectional and longitudinal associations between LVs.

In the first analytical set, we developed a Parenting measurement model that took into account commonalities between parenting indicators, and thereby derived more robust and reliable parenting LVs (Parental Involvement, Control, Rejection, and Stress) to be used in subsequent analyses. In a similar fashion, we developed a Child Adjustment measurement model, to derive LVs aligned with the BASC-PRS theoretical structure (yielding three composite indexes for Internalizing problems, Externalizing problems and Social competence). Details of these models, including model specification parameters are presented in the Results section. In the second analytical set, these Parenting and Child Adjustment models were tested for measurement invariance to ensure that the outlined latent constructs had the same substantive meaning for diverse participant groups and over time. Multi-Group Confirmatory Factor Analyses (CFA) (Byrne, Shavelson, & Muthén, 1989) were conducted using three grouping factors successively: (a) child age (Child -- under 12, and Adolescent -- above 12), (b) child gender (male vs. female), and (c) ethnicity (Caucasian, African-American, and Others). Four versions of the measurement models with increasing invariance stringency were tested (e.g., Bollen & Bollen, 1989; Byrne et al., 1989): Configural invariance (same configuration of scale-factor loadings across groups), Weak invariance (same pattern of scale factor loadings), Strong invariance (weak invariance model adding the constraints of equal measurement intercepts across groups), and Strict invariance (strong invariance model adding the constraint of equal indicators' residual variance across groups). Similarly, measurement invariance over time (e.g., Meredith & Horn, 2001) was tested to ensure that the substantive meaning of each LV didn't change overtime. Both Parenting and Child Adjustment models were extended into longitudinal multivariate factor models (e.g., McArdle & Nesselroade, 1994; McArdle, 2009), where an unrestricted version (i.e., Configural invariance with no restrictions on factor loadings, indicators intercepts and residual variance across measurement occasion) was compared to models with the same level of invariance stringency as described above.

The resulting Parenting and Child Adjustment longitudinal measurement models were integrated in a single multiple-common-factors crossed-lagged regression model (e.g., McArdle, 2009) in order to isolate the patterns of influence across the parenting and child adjustment constructs (LVs) over time. Although the sample size in this study was limited ($N = 361$), a power analysis suggested that this size was adequate to detect effects of relatively small magnitude ($d = .23$; $\alpha = .05$) with sufficient power (.80; see Westland, 2010) in this model. Specifically, the most invariant models of Parenting and Child Adjustment were combined in a way that each common LV influences itself over time with lagged autoregression, and each LV crosses-over to influence all the other LVs at follow-up (cross-lagged correlation of residual terms between common-indicators were freely estimated). Thus, we were able to examine simultaneously (a) cross-sectional correlations between LVs, (b) autoregressive pathways of association within each LV, and (c) cross-lagged pathways of association between LVs. The relative amount of variance (R^2) of the dependent variables (LVs at T2) accounted for by the explanatory variables (LVs at T1) was also estimated.

Prior diagnosis of the missingness patterns in our data (holding at least a condition of Missingness At Random; Little's MCAR test, $\chi^2 = 987.97$, $df = 974$, $p = .37$) allowed for the use of Full Information Maximum Likelihood Estimation (FIML) to estimate all SEM parameters. FIML makes full use of the data available (data from partially completed cases contributed to the estimation of parameters that involve the missing portion of the data as well; see, Jeličić, Phelps, & Lerner, 2009, 2010). To assess the fit of all models, we used the Chi-square test of fit, in addition to the Comparative Fit Index (CFI) – a robust index that performs very well even with small sample sizes – and the Root Mean Square Error of Approximation (RMSEA) and its 90% confidence interval. Invariance decisions were based both on the non-significance of the χ^2 between the unconstrained and the constrained models, as well as a difference in CFI (ΔCFI) lower than .01 to indicate strict invariance (Byrne, 2010; Cheung & Rensvold, 2002).

Results

Preliminary Analyses

Table 1 displays the means, standard deviations, and internal consistency coefficients (Cronbach's alpha) of the parenting and child adjustment measures for both T1 and T2. As indicated, internal consistency of the scores was moderate to high with Cronbach's alpha coefficients across measurement occasions ranging from .61 to .94 ($M_{\alpha T1} = .78$, $M_{\alpha T2} = .80$). Screening of the data for distributional properties indicated a tendency of non-normal distribution for some indicators. Therefore, we computed normal scores closer to the Gaussian distribution using the Rankit transformation method (Solomon & Sawilowsky, 2009). Correlation matrices obtained at both T1 and T2 show suitable features to be used as input data in the planned analyses (Bartlett's test of sphericity at T1 = 4437.3, $df = 231$, $p < .001$; at T2 = 1758.4, $df = 153$, $p < .001$; KMO = .89 at both T1 and T2).

Although this study did not specifically focus on the multiple dimensions of adversity that characterize the sample (e.g., maternal psychopathology), preliminary analyses and related work (Barbot et al., 2013; Luthar & Sexton, 2007) indicated that mothers with a history of drug abuse and/or depression tend to report more maladaptive parenting and child

internalizing and externalizing problems, than mothers with no history of psychopathology. The differences are overall of small to moderate magnitude (average partial $\eta^2 = .031$ and .014 at T1 and T2, respectively), with the highest differences observed on the *Parent factors* subscale of the PSI at both measurement occasions (partial $\eta^2 = .14$ and .07 at T1 and T2, respectively). Hence, distress that mothers experience in their role as parent seems, as reviewed above, particularly elevated for mothers with mental health issues.

Parenting Model

In accordance with recent attempts to organize multiple parenting constructs into broader, yet essential categories of parenting (de Haan, 2012; Hoeve et al., 2009; Kawabata, Alink, Tseng, van IJzendoorn, & Crick, 2011), we developed a four-factor measurement model of parenting using the PSI, PCRI, and PARQ scales, with the hypothesized dimensions of (a) Involvement, (b) Rejection, (c) Control, (d) and Stress. As illustrated in Figure 1, the Involvement LV was specified by loading the *Involvement* and *Communication* scales from the PCRI and the *Warmth/Affection* scale from the PARQ. The Rejection LV was specified by loading the *Hostility/Aggression*, *Indifference/Neglecting*, and *Undifferentiated Rejection* scales from the PARQ. Consistent with PAR Theory (Rohner et al., 2005), Involvement and Rejection LVs were conceptualized as the adaptive and maladaptive aspects of maternal support. The third LV, Control, included the dimensions of *Limit-setting* and *Autonomy* from the PCRI. In line with the work of Suchman and colleagues (2007), this LV refers to a mother's ability to establish limits and apply discipline consistently, while accepting the child's expression of age-appropriate signs of independence and autonomy. Finally, the three PSI scales (*Child-focused*, *Relationship-focused* and *Parent-focused*) were grouped into the Parental Stress LV in accordance with the PSI's underlying theory, leading to the computation of a single higher-order score of parenting stress (Abidin, 1995). These four factors of Parenting behaviors and stress were conceptualized to be oblique and were thus allowed to inter-correlate.

As reflected in Table 2, this hypothesized measurement model yielded a limited fit to the data. In a second stage of analyses, suggested modification indices (MI) underlining the source of misfit were examined in order to develop an adjusted version of the initial model with better fit. Accordingly, parameters were fixed or set free in an iterative process. In all, three modest loadings were added in a way that was meaningful with regard to the theory: (a) *Warmth/Affection* was loaded to the Rejection LV and yielded a small negative loading; (b) *Autonomy* was loaded to the Involvement LV and yielded a small negative loading; and (c) *Child-focused distress* was loaded to the Parental Control LV, yielding a negative loading. Additionally, one correlation between two indicators residual terms was allowed between *Warmth/Affection* and *Indifference/Neglect* (two PARQ scales) and yielded a modest negative correlation ($r = -.34$). This adjusted version returned an acceptable fit to the data at both T1 and T2 (Table 2).

Multi-group CFA indicated that this adjusted model was equivalent across age, ethnic and gender groups (the strict invariance condition held in each set of analyses). Longitudinal invariance testing suggested that, even in the strict invariance condition, no degradation in fit was observed ($\chi^2_{[df]} = 32.5 [31], p = .39, CFI = .001$). Therefore, strict invariance over

time was assumed (Table 2). The Parenting Measurement Model and its scale-factor loadings and inter-factors correlations estimated in the longitudinal parallel model are depicted in Figure 1 (for one measurement occasion). Correlation between these outlined parenting constructs were coherent in direction and moderate to high in size (ranging from -.72 to .59), with the strongest associations observed between Parenting Stress and the behavioral dimensions of parenting (Involvement, Rejection and Control). Cross-lagged correlation of two common-factor scores estimated in the longitudinal model, indicated a high rank-order stability of the factor scores over five years (with $r = .66, .65, .59$ and $.62$, respectively, for Parenting Stress, Control, Involvement and Rejection).

Child Adjustment Model

Following the theoretical structure outlined by Reynolds and Kamphaus (1998) BASC-PRS's "final model", three composite indices underlying the 11 selected "Comparable Scores Scales"; were modeled as LVs, including (a) Externalizing problems (mainly loaded with *Hyperactivity*, *Aggression* and *Conduct Problem* scales), (b) Internalizing problems (e.g., *Somatization*, *Anxiety*, *Depression*, and *Withdrawal*), and (c) Social competence (*Social Skills*, *Leadership*). In line with Reynolds and Kamphaus's final model and consistent with theoretical expectations (Reynolds & Kamphaus, 1998), four indicators were allowed to load on more than one LV (e.g., *Atypicality* was specified as an indicator of both the Internalizing and Externalizing LVs). This model yielded an adequate fit to the data at both measurement occasions (Table 2) with scale-factors loadings and factor inter-correlation of similar magnitude compared to the original solution presented by Reynolds and Kamphaus (1998; see also Barbot et al., in press).

In a second step, the structural invariance of the Child Adjustment model was tested in a multi-group CFA, to ensure that the underlying meaning of the perceived child adjustment constructs (LVs) was identical across all groups (Table 2). Even in the more stringent conditions, no deterioration in fit was noted and invariance was confirmed with a high level of invariance stringency across age, ethnic, and gender groups (i.e., strict invariance conditions held in each set of analyses, with no substantial degradation in fit, except in the gender analysis yielding a slight degradation in χ^2 but not in CFI). Similarly, the longitudinal invariance testing suggested that the strict invariance condition was realistic when compared to the configural invariance condition where no restriction on scale-factor loadings, indicator intercepts and indicators residual variance was imposed ($\chi^2_{[df]} = 27.3$ [28], $p = .51$, $CFI = .000$). Hence, strict invariance over time was assumed and cross-lagged correlation between common-factors was explored, suggesting a moderate rank-order stability of these child adjustment constructs over time (with $r = .52, .59$ and $.65$ for Externalizing, Internalizing, and Social Competence, respectively).

Cross-lagged Relations between Parenting and Child Adjustment Constructs

The longitudinal models of Parenting and Child Adjustment (strict invariance versions) were integrated in a single crossed-lagged structural regression model that fit the data adequately ($\chi^2 = 1650.8$, $df = 942$, $p < .001$, $\chi^2/df = 1.75$, $CFI = .91$, $RMSEA = [.046 .042 - .049]$). The model, however, did not converge in the multi-group analysis conducted to explore group differences (age, gender and ethnicity) in the study of the longitudinal reciprocal effects.

Therefore, to account for these important demographic factors, we extended the crossed-lagged regression model by incorporating the group variables (dummy codes that denote group membership) as covariates of the follow-up latent factors. As a result, this model (similar to a longitudinal extension of the “multiple indicators multiple causes” MIMIC approach, e.g., Finch, 2012) served to control the analysis for these background factors and to identify population heterogeneity across the groups (group differences on latent means). The fit of this model was satisfactory ($\chi^2 = 1827.2$, $df = 1025$, $p < .001$, $\chi^2/df = 1.78$, CFI = .91, RMSEA = .047 [.043 - .050]).

Figure 2 presents this longitudinal reciprocal model with covariates and with its associated parameter estimates. This single analysis yielded much information on the developmental dynamic and reciprocal influences between mothers' parenting stress and behaviors and perception of their children's adjustment. Aside from expected cross-sectional results already indicated in the literature, of central interest were cross-lagged associations between child versus mother dimensions, with clarification of the pattern of influences over time, as it estimates the unique contribution of each predictor over and above the set of remaining predictors.

As shown in Figure 2, maternal perceptions of children's Externalizing problems at T2 were mostly predicted by prior (Time 1) levels of both Parental control ($\beta = -.37$, $p < .01$) and Involvement ($\beta = .23$, $p < .05$). Notably, the autoregressive pathways of associations in mother-rated Externalizing problems did not yield a significant β , suggesting that the influence of other factors explains this maternal perception. Maternal perception of children's Internalizing problems was mostly predicted by prior Internalizing problems ($\beta = .59$, $p < .001$) and additionally, by maternal Rejection ($\beta = .26$, $p < .01$). Social Competence was significantly predicted only by prior Social Competence ($\beta = .55$, $p < .01$).

Despite relatively high autoregressive pathways of association within each parenting dimension (i.e., each prior parenting dimension predicted the same parenting dimension at follow-up, with respective $\beta = .36$, $.63$, $.52$, and $.59$ for Parental Stress, Control, Involvement and Rejection), some maternal perceptions of child adjustment at Time 1 also uniquely predicted parenting dimensions five years later, at Time 2. In particular, Parental Stress at follow-up was increased by mothers' perceptions of Child Internalizing problems at baseline ($\beta = .27$, $p < .05$). Child Social Competence appeared to be “protective,” across several dimensions, predicting less parenting stress at T2 ($\beta = -.15$, $p < .05$) and also higher maternal Involvement ($\beta = .18$, $p < .05$) and better Parental Control competence ($\beta = .17$, $p < .05$). As a whole, these results suggest strong reciprocal influences of the Parenting and perceived Child Adjustment dimensions over a five-year period.

Discussion

In this study, we investigated sources of distress and well-being in the motherhood experiences of women with multiple dimensions of adversity: mothers' perceptions of their children's maladjustment and social competence. Major dimensions of parenting and child functioning were characterized with robust latent constructs that were invariant over time and across important demographic factors. Our analyses permitted the study of (a) cross-

sectional relations between parenting and child adjustment, as well as (b) cross-lagged pathways of association between these constructs to estimate bi-directional effects of parenting and perception of child adjustment concurrently, and longitudinally. Major findings suggest that, besides already well-established mother-to-child effects, mothers' perceptions of their children's adjustment appear to affect their own feelings in the parenting role over a relatively long period of time. Patterns of bi-directional influence (concurrent and crossed-lagged) and their implications for future research and applications are summarized and discussed separately.

Concurrent Associations

Cross-sectional analyses indicate that maternal stress is strongly associated with negative parenting dimensions (high rejection, and low parental control and involvement), with correlations between constructs translating to 36% to 52% of shared variance. This is consistent with a body of parenting-stress research suggesting that parenting behaviors are explained or mediated by a parent's ability to cope with the everyday stresses of parenting (Abidin, 1992; Allen et al., 2010; Mash & Johnston, 1990; Webster-Stratton, 1990). Our results also demonstrate that maternal stress was highly associated with both child externalizing and internalizing problems (30% and 24% of shared variance, respectively) -- also in line with previous findings (Supkoff et al., 2012)--, while children's Social Competence was negatively associated with Parental Stress (22% of shared variance), placing this domain of child adjustment as a concurrent protective factor against maternal stress (see cross-sectional associations of Figure 2).

All aspects of child maladjustment in this study were also associated moderately (Internalizing) to highly (Externalizing) with the parenting dimensions, consistent with our hypotheses and with prior research (Abidin, 1992; Allen et al., 2010; Caron et al., 2006; Galambos, Barker, & Almeida, 2003; Hoeve et al., 2009; Lovejoy et al., 2000; Suchman et al., 2007). Unique to this study, mothers' perceptions of their child's social competence were related to the parenting constructs (an average of 19% of shared variance), with the strongest association with Maternal Involvement.

Cross-Lagged Long-Term Relations

Overall, our findings showed moderate stability of both parenting and perceived child adjustment dimensions over five years. Specifically, autoregressive associations within constructs revealed reasonable predictive power (i.e., continuous dimensions) of baseline levels (e.g., parental Control level at baseline positively predicts parental Control level at follow-up), except for the Externalizing problems dimension. In line with prior research over shorter (i.e. one year, Campbell, March, Pierce, Ewing, & Szumowski, 1991) and similar periods of time (i.e. six years, Verhulst & Der Ende, 1992) which found moderate to limited stability of Externalizing problems, this result reinforces the notion that children's problem behaviors -- and here, how they are perceived by their mothers -- should not be regarded as static (Verhulst & Der Ende, 1992).

The central question in this study was whether dimensions of parenting, and of perceived child adjustment, would each predict follow-up levels of the other. Multivariate cross-lagged

pathways – isolating unique contributions considering all variables at Time 1 and Time 2 – confirmed reciprocal influences between the two sets of constructs. Among the parenting constructs as predictors, maternal Rejection at baseline predicted children's Internalizing problems at follow-up ($\beta = .26, p = .02$). This effect suggests a rather long-term impact of maternal rejection in the development of internalizing problems such as anxiety, depression or somatization, complementing cross-sectional observations in the present and other studies (Barbot, Heinz, & Luthar, 2014; Caron et al., 2006; Galambos et al., 2003; Hipwell et al., 2008). In addition, baseline maternal Control predicted lower levels of child Externalizing problems at follow-up ($\beta = -.37, p < .001$), indicating the long-term protective effect of this feature of parenting that has previously been demonstrated in cross-sectional studies (Hoeve et al., 2009).

Unexpectedly, maternal Involvement predicted increased Externalizing problems in children, raising conceptual questions about the nature of this parenting dimension. This result possibly echoes findings that an “excess” of parental involvement (over-involvement) leads to the development of negative outcomes in children, such as increased severity and intensity of externalizing, internalizing, and asocial/maladaptive behaviors (Greenberg, Seltzer, Hong, Orsmond, & MacLean, 2006). Thus, the observed contribution of maternal Involvement to child Externalizing problems in our study may reflect developmentally inappropriate protective behaviors or over-involved communication styles within the home (van Ingen, Moore, & Fuemmeler, 2008). These interpretations are speculative, however; future research should examine this relationship more closely with a measure that is more sensitive to over-involvement, or by exploring population heterogeneity associated with this effect.

Effect sizes for parenting to child adjustment association pathways were comparable to those estimated for the reverse direction, suggesting that mothers can be affected as much by their children (as per their own perceptions), as they affect their children's adjustment. In terms of specific associations found, Internalizing problems in children were related to significant increases in levels of maternal Stress over time. These findings lend empirical support to the old adage, “A mother is only as happy as her least happy child.” In the phenomenological experience of motherhood, a mother's knowing – or even believing – that her child is in distress, can be a great source of stress. And among psychiatrically vulnerable, low-income mothers such as those participating in this study, chronically high stress could impair multiple aspects of their everyday functioning and the parenting behaviors displayed to the multiple children often in their sole care (Luthar, Cushing, Merikangas, & Rounsaville, 1998).

The absence of parallel long-term links involving maternal perceptions of children's Externalizing behaviors could be for three reasons. First, as Richters and Cicchetti (1993) noted in their seminal paper, some level of adolescent externalizing behavior can be normative and even adaptive (self-protective), in the context of inner-city settings affected by crime and violence (see also Barbot et al., 2012; Barbot & Hunter, 2012, for a review). To the degree that some externalizing behavior was normative in the community, mothers in this sample may not have been inordinately troubled upon learning about occasional acts of delinquency or aggression in their children. Second, it has been reported that early

externalizing behaviors predict parental disengagement. In particular, mothers with substance use disorders, as a group, provide their children with less optimal parenting than other mothers from similar socioeconomic backgrounds, including higher disengagement (Hans, Bernstein, & Henson, 1999). Thus disengaged, a mother would be subject to less distress in reaction to possible ongoing externalizing behaviors (Laird, Pettit, Bates, & Dodge, 2003; Williams & Steinberg, 2011). Collectively, these possibilities warrant attention in future research.

In terms of perceptions of child behaviors, what stood out in our findings was that mothers benefited when they believed their children had good social competence. These perceptions even generalized to multiple domains of parenting over time: high perceived social competence of their children predicted decreases in mothers' parenting stress, increases in effective limit setting, and increases in parental involvement or feelings of closeness with their children. Future research should explore the mechanisms underpinning this link in greater detail. It may reflect direct effects within the mother-child dyad, or more indirect effects such as the child's prosocial behaviors contributing to a less stressful family dynamic overall. Together, these results suggest that, just as mother-child interaction may shape child social competence and externalizing behaviors (Connell & Prinz, 2002; Kawabata et al., 2011), maternal perception of child adjustment (social competence) and maladjustment (externalizing and internalizing problems) may greatly shape their self-perceptions of parenting competence and level of distress in their role as parents.

From an intervention perspective, these findings suggest two important implications. The first is to ensure help for inner-city youth who – even while showing no outward rebelliousness or externalizing problems – are distressed (see e.g., Luthar, 1991). In general, adults are more responsive to childhood disturbances that cause them inconvenience, than problems such as depression or anxiety; this can be particularly pronounced in low-income settings where resources are stretched thin. Our findings suggest however that, left untreated, internalizing problems in youth are not only likely to persist, but are also likely to cause significant stress for their mothers in the long-term.

Another direction for intervention would be to work with mothers toward recognizing the different strengths of their children – thus avoiding global negative views of themselves as mothers. Guilt is a common experience of motherhood, and mothers afflicted with serious mental illness, such as substance use disorders, tend to feel more guilt than most (Luthar et al., 2001). There is a danger of developing global, internal, negative self-views (e.g., “I'm no good as a mother”), paving the way to learned helplessness or exacerbation of mental illness (Seligman, 1975). Helping mothers to recognize the unique strengths of their children – such as respect, caring, helpfulness (see e.g., Burton & Jarrett, 2000) – could over time help to ward off generalized negative views, and keep them functioning relatively well as individuals and as parents.

Our findings also emphasize the need for concerted attention to parenting interventions specifically for families involving older youth. Traditionally, interventions for at-risk, inner-city families have focused on those with young children (e.g., Wiggins et al., 2005). While these are certainly valuable, our findings demonstrate that the dyadic relationship between

mothers and school age children or adolescents remains dynamic, and thus amenable to intervention. While this study examined only one (target) child in the family, it is noteworthy that most had siblings, and these findings therefore have potentially broader implications at the family level. If a mother is feeling highly stressed, this will inevitably spill over not only to her own psychological and physical health (Grippe & Johnson, 2009) but also, in her parenting behaviors with all her children.

Study Limitations and Future Research

Despite the robustness of the data analytic approach used, our cross-lagged regression model including a total of 14 latent constructs built upon 44 manifest indicators (22 variables at each measurement occasion) was highly demanding in sample size. Although the sample used in this study was, as anticipated, sufficiently large to detect effects of rather small magnitude (Westland, 2010), this model could not be extended in a multi-group analysis with enough statistical power to investigate population heterogeneity according to important demographic factors including maternal diagnosis. Though the measurement models presented strict parallel invariance according to child gender, age, and ethnicity, this does not guarantee that the bidirectionality observed between maternal perceived parenting and child adjustment factors would be the same across groups. A larger sample size would be useful in future research to employ a mixture modeling technique in order to identify the pathways of associations that may differ across these groups. This would be particularly relevant to better understand the processes of bidirectionality within a developmental psychopathology framework (taking into account child age), as the strength of cross-lagged links between child adjustment and parenting could vary depending on the child's specific developmental period (Pardini, Fite, & Burke, 2008; Pettit & Arsiwalla, 2008) or maternal psychopathology.

Although the use of a sample of at-risk mothers contributed to a better identification of sources of stress and maladjustment in parenting unexplored to date, results obtained in this study may not be generalizable to other samples. Additionally, future analyses should explore the specific effects of different forms of maternal psychopathology on both parenting and stress, and in relation to children's adjustment. Mothers' psychopathology can moderate their vulnerability to stress (Barbot et al., 2013), and mothers with higher initial levels of depressive symptoms might find teen externalizing behaviors especially distressing (Allen et al., 2010). Similarly, maternal depression in particular appears to exacerbate children's risk for maladjustment (Feder et al., 2009; Foster et al., 2008).

A further limitation is that all variables in this study were based upon mothers' reports; thus, our results should be seen as providing preliminary insights into the bidirectional links between dimensions of parenting and mothers' views of their children's adjustment. In future studies, a multi-informant approach (e.g., ratings by partners, children, or observers) may further advance our understanding of reciprocal parent-child influences within such vulnerable populations.

Conclusion

Maternal behaviors and stress levels have long been studied as determinants of child adjustment, but there is relatively little research also examining reciprocal associations, that is, perceptions of children's functioning as determinants of the motherhood experience. In a sample of low-income, psychiatrically vulnerable mothers, we integrated multiple, conceptually salient dimensions of parenting and child adjustment to explore mother-child reciprocal influences over five years. Our results suggested that when mothers felt positive about parenting (including appropriate parental monitoring and support), this was reflected in long-term gains in their children's adjustment. We also found several associations of considerable magnitude in the opposite direction, wherein maternal views of their children's adjustment affected mothers' feelings about their parenting five years later. In particular, mothers' views of their children's distress uniquely contributed to their experience of parenting stress. Additionally, positive perceptions of children's social competence uniquely contributed to less stress, greater involvement and greater control. While mothering is undoubtedly a fundamental factor in children's adjustment, therefore, it is clear that the well-being of mothers can rest substantially on their perception of how well their children are functioning. For clinicians, a direct corollary is that in future interventions for vulnerable mothers and their children, direct attention provided to each member of the dyad could have substantial positive spillover effects for the well-being of the other.

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Figure 1. Parenting CFA Model

Factors loadings and correlations estimates are those obtain with the longitudinal model with strict parallel invariance. All loadings and correlations are significant at $p < .001$, except PCRI *Autonomy* loading on Involvement ($p = .002$).

Figure 2. Multiple-common-factors crossed-lagged regression model with covariate at follow-up
 Involv. = Involvement; External. = Externalizing Problems; Internal. = Internalizing problems; Social Comp. = Social Competence; For the sake of clarity, the loadings of manifest variables and the correlations between factors within the parenting model and within the child adjustment model are not displayed (see Figure 1 & 2). Only significant pathways are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1
Descriptive Statistic and Internal Consistency of the Parenting and Child Adjustment Measures

Measure (number of items)	T1					T2				
	Min	Max	M	SD	α	Min	Max	M	SD	α
Parenting Stress (PSI)										
Parent-focused (12)	12	57	27.26	8.48	.84	12	60	26.50	9.03	.88
Relationship-focused (12)	12	51	23.23	8.10	.86	12	55	23.68	8.99	.90
Child-focused (12)	12	56	28.74	8.96	.87	12	60	28.13	9.66	.94
Parent-Child Relationship (PCRI)										
Involvement (14)	29	56	46.65	5.53	.82	23	56	45.56	5.83	.80
Communication (9)	17	36	28.84	3.66	.74	9	36	28.14	3.71	.70
Limit Setting (12)	13	48	32.59	6.12	.83	14	47	33.60	6.34	.83
Autonomy (10)	12	35	23.99	4.06	.62	14	36	24.45	4.25	.63
Parental Acceptance-Rejection (PARQ)										
Warmth/Affection (20)	56	80	74.61	5.12	.82	41	80	73.73	6.29	.84
Hostility/Aggression (15)	15	46	25.46	6.38	.81	15	52	25.30	7.30	.87
Indifference/Neglect (15)	15	37	21.62	4.77	.70	15	42	21.24	5.01	.79
Undifferentiated Rejection (10)	10	36	15.03	3.89	.63	10	28	14.68	3.76	.61
BASC-PRS										
Hyperactivity (7)	0	2.86	.58	.51	.78	0	3.00	.52	.54	.82
Aggression (8)	0	3.00	.47	.39	.76	0	2.25	.44	.39	.78
Conduct Problems (8)	0	2.63	.43	.42	.79	0	2.38	.49	.47	.81
Anxiety (5)	0	3.00	.72	.51	.69	0	2.60	.64	.51	.74
Depression (8)	0	2.75	.52	.46	.81	0	2.63	.50	.48	.84
Somatization (9)	0	3.00	.49	.41	.77	0	2.33	.50	.40	.76
Atypicality (8)	0	3.00	.16	.28	.75	0	2.00	.13	.26	.72
Withdrawal (5)	0	2.00	.45	.43	.62	0	2.00	.50	.47	.64
Attention Problems (5)	0	3.00	1.22	.62	.71	0	3.00	1.25	.62	.74
Social Skills (11)	0	3.00	1.76	.63	.88	.55	3.00	1.74	.62	.88
Leadership (11)	0	3.00	1.62	.59	.85	.45	3.00	1.67	.60	.85

Note. α = Cronbach' Alpha, T1 N = 360; T2 N = 280. Note. T1 N = 360, T2 Parenting measure N = 280, T2 Child adjustment measure N = 151.

Table 2
Goodness of Fit Indexes and Invariance Testing of the Parenting Models

Model	χ^2	df	χ^2/df	p	χ^2	CFI	CFI	RMSEA (CI)
Cross sectional Models								
T1 Initial model	216.3	39	5.55	.000	–	.91	–	.112 (.098 - .127)
T1 Adjusted model ^a	93.4	35	2.67	.000	.000	.97	–	.068 (.052 - .085)
T2 Initial model	158.5	39	4.06	.000	–	.93	–	.092 (.078 - .107)
T2 Adjusted model ^a	78.8	35	2.25	.000	.000	.97	–	.059 (.042 - .076)
T1 Age-group Models ^b								
Configural invariance	120.8	70	1.73	.000	–	.97	–	.045 (.031 - .058)
Weak invariance	128.7	80	1.61	.000	.636	.98	.001	.041 (.027 - .054)
Strong invariance	137.2	90	1.53	.001	.691	.98	.002	.038 (.025 - .051)
Strict Parallel	152.6	101	1.51	.001	.425	.97	.000	.038 (.025 - .050)
T1 Ethnic-group Models ^b								
Configural invariance	190.7	105	1.82	.000	–	.96	–	.048 (.037 - .058)
Weak invariance	205.3	125	1.64	.000	.799	.96	.002	.042 (.032 - .053)
Strong invariance	232.9	145	1.61	.000	.375	.96	.001	.041 (.031 - .051)
Strict Parallel	270.1	167	1.62	.000	.067	.95	.009	.042 (.032 - .050)
T1 Child gender Models ^b								
Configural invariance	126.5	70	1.81	.000	–	.97	–	.047 (.034 - .060)
Weak invariance	136.8	80	1.71	.000	.411	.97	.000	.044 (.031 - .057)
Strong invariance	142.4	90	1.58	.000	.723	.97	.002	.040 (.027 - .052)
Strict Parallel	150.7	101	1.49	.001	.800	.97	.004	.037 (.024 - .049)
T1-T2 Longitudinal Models ^b								
Configural invariance	310.6	165	1.88	.000	–	.97	–	.050 (.041 - .058)
Weak invariance	323.8	175	1.85	.000	.210	.97	.001	.049 (.040 - .057)
Strong invariance	337.1	185	1.82	.000	.151	.97	.002	.048 (.040 - .056)
Strict Parallel	343.1	196	1.75	.000	.392	.97	.001	.046 (.038 - .054)

Note.

^a three modest loadings added (Warmth/Affection loaded to Rejection, Autonomy loaded to Involvement and Child-oriented distress loaded to Parental Control) and one correlated error term added ($r_{\text{Warmth/Affection-Indifference/Neglect}} = -.34$);

^b invariance testing using the “adjusted model” as baseline; $\chi^2 = \text{chi-square}$; $df = \text{degrees of freedom}$; $p = p \text{ value of the chi-square test}$; $\chi^2_p = p \text{ value of the chi-square difference test}$; CFI = Comparative fit index; CFI = difference in the CFI value (assuming baseline model to be correct); RMSEA = root mean square error of approximation; CI = 90% confidence interval of RMSEA value.

Table 3
Goodness of Fit Indexes and Invariance Testing of the Child Adjustment Models

Model	χ^2	df	χ^2/df	p	χ^2	CFI	CFI	RMSEA (CI)
Cross sectional Models								
T1 Final	98.0	38	2.56	–	.000	.97	–	.066 (.050 - .083)
T2 Final	56.1	38	1.48	–	.000	.98	–	.057 (.019 - .087)
T1 Age-group Models ^a								
Configural invariance	143.6	76	1.89	.000	.000	.97	–	.050 (.037 - .062)
Weak invariance	162.2	88	1.84	.000	.100	.96	.003	.049 (.037 - .060)
Strong invariance	162.9	94	1.73	.000	.37	.97	.003	.045 (.033 - .057)
Strict Parallel	181.5	104	1.75	.000	.100	.96	.005	.046 (.034 - .057)
T1 Ethnic group Models ^a								
Configural invariance	208.6	114	1.83	.000	–	.95	–	.048 (.038 - .058)
Weak invariance	229.1	138	1.66	.000	.668	.95	.002	.043 (.033 - .053)
Strong invariance	257.9	150	1.72	.000	.069	.94	.007	.045 (.035 - .054)
Strict Parallel	281.7	170	1.66	.000	.062	.94	.009	.043 (.034 - .052)
T1 Child gender Models ^a								
Configural invariance	129.8	76	1.71	.000	–	.97	–	.044 (.031 - .057)
Weak invariance	153.1	88	1.74	.000	.025	.97	.006	.045 (.033 - .057)
Strong invariance	159.9	94	1.70	.000	.036	.97	.006	.044 (.032 - .056)
Strict Parallel	172.9	104	1.66	.000	.034	.96	.008	.043 (.031 - .054)
T1-T2 Longitudinal Models ^a								
Configural invariance	261.9	178	1.47	.000	–	.97	–	.036 (.026 - .045)
Weak invariance	270.9	190	1.43	.000	.703	.97	.001	.034 (.025 - .043)
Strong invariance	273.3	196	1.39	.000	.874	.98	.002	.033 (.023 - .042)
Strict Parallel	289.1	206	1.40	.000	.505	.97	.000	.033 (.024 - .042)

Note.

^a invariance testing using the Reynolds and Kamphaus (1998) "Final model" as baseline; χ^2 = chi-square; df = degrees of freedom; p = p value of the chi-square test; χ^2 = p value of the chi-square difference test; CFI = Comparative fit index; CFI = difference in the CFI value (assuming baseline model to be correct); RMSEA = root mean square error of approximation; CI = 90% confidence interval of RMSEA value.