Longitudinal Pathways from Early Maternal Depression to Children's Dysregulated

Representations: A Moderated Mediation Analysis of Harsh Parenting and Gender

Tiffany L. Martoccio, Ph.D. (corresponding author), University of Maryland School of Social Work, 525 West Redwood Street, Baltimore, MD 21201, USA. Email: tmartoccio@ssw.umaryland.edu

Holly E. Brophy-Herb, Ph.D., Department of Human Development and Family Studies, Michigan State University, 552 West Circle Drive, East Lansing, MI 48824, USA. Email: hbrophy@msu.edu

Angela N. Maupin, Ph.D., Child Study Center, Yale University School of Medicine, 230 South Frontage Road, New Haven, CT 06520, USA. Email: angela.maupin@yale.edu

JoAnn L. Robinson, Ph.D., Department of Human Development and Family Studies, University of Connecticut, 348 Mansfield Road, Unit 1058, Storrs, CT 06269, USA. Email: joann.robinson@uconn.edu

Abstract

There is some evidence linking maternal depression, harsh parenting, and children's internal representations of attachment, yet, longitudinal examinations of these relationships and differences in the developmental pathways between boys and girls are lacking. Moderated mediation growth curves were employed to examine harsh parenting as a mechanism underlying the link between maternal depression and children's dysregulated representations using a nationally-representative, economically-vulnerable sample of mothers and their children ($n =$ 575; 49% boys, 51% girls). Dysregulation representations were measured using the MacArthur Story Stem Battery at five years of age ($M = 5.14$, $SD = 0.29$). Harsh parenting mediated the association between early maternal depression and dysregulated representations for girls. Though initial harsh parenting was a significant mediator for boys, a stronger direct effect of maternal depression to dysregulated representations emerged over time. Results are discussed in terms of their implications for intervention efforts aimed at promoting early supportive parenting.

Keywords: gender differences; harsh parenting; internal representations; low-income; maternal depression; story stem narratives

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Representations: A Moderated Mediation Analysis of Harsh Parenting and Gender

Research during the past decade has provided increasing evidence of the detrimental effects of adverse caregiving environments on children's psychological processes, through which experience is mentally represented and influences subsequent behaviors (e.g., Bascoe, Davies, Sturge-Apple, & Cummings, 2009; Schechter et al., 2007). Stressful caregiving environments characterized by elevated levels of maternal psychosocial problems, most notably depression, and harsh and insensitive parenting behaviors prove particularly disruptive to the organization of children's internal representational models (Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). According to attachment theory and research, internal working models develop on the basis of individual experiences with the primary attachment figure and have long been identified as a significant mechanism associated with attachment security (Bowlby, 1969; Bretherton, 1985). Longitudinal investigation of harsh parenting during toddlerhood as a mechanism underlying associations between maternal depression and children's internal representations holds promise to further elucidate etiological processes, particularly by uncovering differential pathways for boys and girls (Blandon, Calkins, Keane, & O'Brien, 2008; Chang, Schwartz, Dodge, & McBride-Chang, 2003). The present study draws on a sample of nationally-representative, economically vulnerable mother-child dyads with an especially powerful analytic approach to examine how early exposure to maternal depression and harsh parenting contributes to boys' and girls' later dysregulated internal representations.

According to attachment theory and research, presenting children with stories about emotionally-charged events, by which the child seeks an attachment figure, elicits attachment-related narratives representative of early experiences in the rearing environment. The telling of

an emotionally-charged story inherently challenges children's capacity to regulate emotion as they tell their stories, with the possibility that the emotional priming of the stem will disrupt the coherence as the child enacts strong emotional responses (Shields, Ryan, & Cicchetti, 2001). In the current study, we assessed children's dysregulated representations, characterized by dysregulated aggression, avoidance, dissociation, and negative affect (see Schechter et al., 2007), in their narrative responses to emotionally-charged family scenarios. Each of these four subcategories of dysregulated narrative responses reflects children's difficulties in the regulation and organization of their internal working models when presented with emotionally-evocative family events. Internal representations characterized by dysregulated aggression reflect escalation of aggressive behaviors. Alternatively, other children are unable to cope with negative early experiences with parents and, subsequently, display internal representations in which the key coping strategy is avoidance of strong emotions. Hence, children may avoid a conflictual situation in the family or, as a third study, may dissociate from the central conflict. A fourth potential style examined in the current study was negative affect, suggesting that some children may hold internal representations characterized by the strong presence of negative emotions such as fear and/or sadness.

Maternal Depression and Harsh Parenting

Maternal depression is detrimental to positive parenting because of its diminishing effects on the parent's capacity to be emotionally available and emotionally-supportive to the child (Leinonen, Solantaus, & Punamäki, 2003). Given this, depressed mothers may engage in harsh parenting behaviors, such as the use of frequent commands, coercive interactions with their child, increased irritability, and less positive affective expressivity and sensitivity (e.g., Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009; Downey & Coyne, 1990; Lovejoy, Graczyk,

O'Hare, & Neuman, 2000; Radke-Yarrow, Nottlemann, Belmont, & Welsh, 1993; Silk et al., 2011). Maternal depressive symptoms have also been linked to less secure internal representations of attachment relationships (Toth et al., 2009), and, subsequently, to the development of less optimal socioemotional functioning (Goodman et al., 2011). The relevance of studying links between maternal depression and children's socioemotional development is underscored by the high prevalence of depressive symptoms among parents of young children (Dubowitz et al., 2007). Further, evidence suggests that even 'subthreshold' depressive symptoms exert significant influence on development (Lewinson, Solomon, Seeley, & Zeiss, 2000). Depression contributes to a failure to activate positive parenting behaviors (Dix & Meunier, 2009). Harsher parenting practices associated with parental depression include negative responses to children's distress (Cummings, George, Koss, & Davies, 2013), rejection of the child and low levels of nurturance (Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007), and harsher disciplinary practices (Seng & Prinz, 2008). Harsh parenting behaviors associated with depressive symptoms reflect a sustained negativity within parent-child interactions expected to be reflected in children's dysregulated internal representations of attachment relationships.

Harsh Parenting and Dysregulated Representations

Harsh parenting practices have been linked to children's dysregulated aggression (e.g., Denham et al., 2000; Gershoff, 2002; Sheehan & Watson, 2008) and social withdrawal (e.g., Booth-LaForce & Oxford, 2008; SturgeApple, Davies, Cicchetti, & Manning, 2012). Such behaviors likely reflect dysregulated representations of attachment in early parent-child relationships. Because characteristics of parent-child relationships shift across developmental stages in early childhood and require the parent and child to renegotiate interactions together, it is important to examine harsh parenting over time in relation to children's internalized

experiences (Kim, Pears, Fisher, Connelly, & Landsverk, 2010). Mothers who experience

depressive symptoms may be less able to engage in such renegotiations resulting in the

development of harsh parenting. Sustained harsh parenting over time may contribute to

children's dysregulated internal representations.

There are a number of mechanisms through which harsh parenting could negatively

impact children's representations of early experiences and their subsequent responses to

emotionally-evocative contexts. Parents who use harsh parenting practices, such as harsh

discipline, are more likely to be hypersensitive to children's normative expressions of negative

emotions (Seng & Prinz, 2008), and to perceive their children as having more internalizing and

externalizing behavior problems (Zimmer-Gembeck et al., 2013). Beginning in infancy, these

parents are more likely to respond harshly, contributing to sustained difficulties in parent-child

interactions and the parent-child relationship (Strassberg & Treboux, 2000). Harsh responses to

behavior, and particularly to children's expressions of negative emotions, influence the child's

internal working models of how one responds to negatively-charged events and contribute to an

internalized representation of the parent-child relationship as frightening (Nomura,

Wickramaratne, Warner, Mufson, & Weissman, 2002).

Furthermore, parents who display hostile or negative emotions, particularly when

exhibiting harsh disciplinary behaviors, are often modeling dysregulated behaviors for children

(Chang et al., 2003; Eisenberg et al., 2001). Taken in tandem, hypersensitivity to child behavior,

resulting in elevated levels of harsh disciplinary actions, increases negative attributions of

behaviors (contributing to sustained negativity in parent-child interactions), and, parental

modeling of dysregulated behavior, creating a climate counterproductive to young children's

emotional health. Specifically, these forms of parenting are expected to contribute to children's

internalized perceptions of the family experiences as negative and emotionally dysregulated. Harsh parenting also serves as a potent form of affective communication (Chang et al., 2003) likely reflecting the quality of the parent-child relationship. Within an attachment framework (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969), severe negative affect in the parent-child relationship and harsh parenting behaviors contribute to children's poor socioemotional outcomes, including behavior problems and poor emotion regulation (Erickson, Sroufe, & Egeland, 1985). Lyons-Ruth and Jacobvitz (1999) revealed that parental frightened/frightening behaviors and confusing affect communications with their infants relate to children's insecure attachments. Children with insecure attachments are more susceptible to the deleterious effects of exposure to early adversity.

Gender Differences

Prior research has revealed differences in the impact of harsh parenting on boys and girls (Barnett & Scaramella, 2013; Kim, Arnold, Fisher, & Zeljo, 2005). This underscores the importance of examining potential gender differences in the internalizing of early experiences. Boys have been found to demonstrate more disruptive behavior problems as compared with girls (e.g., Kerr, Lopez, Olson, & Sameroff, 2004; Rothbaum & Weisz, 1994), particularly in the context of maternal depression (e.g., Campbell, Pierce, Moore, Marakovitz, & Newby, 1996; Connell & Goodman, 2002). Although internalizing symptoms are less common in young children, a meta-analysis evaluating the effects of maternal depression on child symptoms found that maternal depression more strongly related to girls' compared with boys' internalizing symptoms (Goodman et al., 2011). Taken together, such results suggest that maternal depression may differentially influence outcomes for boys and girls. In addition, in a clinical sample of parents who were at-risk of committing child abuse, significant gender differences were found

between maternal sensitivity and internalizing symptoms (Zimmer-Gembeck et al., 2013). Specifically, maternal emotional distress influenced internalizing symptoms in girls via its influence on parenting (i.e. maternal sensitivity), but directly influenced internalizing symptoms in boys. These findings suggest that maternal distress may differentially affect girls and boys via its influence on parental behavior.

Study Aims, Modeling Framework, and Hypotheses

Despite posited linkages among dysregulated representations, maternal depression, harsh parenting, and gender, we are not aware of any longitudinal studies that have sought to examine harsh parenting across toddlerhood as a possible mediating process between maternal depression and dysregulated representations, while simultaneously accounting for potential moderating impacts of gender differences in pathways. Because early attachment relationships contribute to the child's evolving representational models of self and of self in relation to others, it is important to understand the specific mechanistic pathways of harsh parenting on long-term outcomes for boys and girls. Early exposure to cumulative risks including maternal depression and harsh parenting have important implications for understanding processes of socioemotional development (Sturge-Apple, Davies, Martin, Cicchetti, & Hentges, 2012) and for targeting effective early intervention programs to enhance secure parent-child relationships (Gershoff, 2002; Kim et al., 2010).

Given the gaps in the current literature, this study was designed to longitudinally test whether harsh parenting (M) mediates the association between early-occurring maternal depression (X) and children's dysregulated internal representations (Y) and the moderating impact of gender (W) (see Figure 1). A moderated mediation approach determined whether different levels of the moderator identify distinct mediated relationships. In order to examine the

hypothesized developmental model strongly embedded within attachment theory and research, we employed a moderated mediation analysis in a latent growth curve framework. Longitudinal data are necessary to make causal inferences regarding mediation. In particular, latent growth curve modeling provide for the testing effects of prior change on later change to determine mediation chains across multiple waves of data (MacKinnon, Fairchild, & Fritz, 2007). To provide intensive tests of our developmental process model, we utilized a multi-informant (i.e., observation and maternal report), repeated measure design across three waves of data collection to examine mediation of harsh parenting initial level (intercept) and linear growth (slope). Intercept loadings were set at the initial data wave- age 1, to estimate possible concurrent effects between early-occurring maternal depression and harsh parenting.

There were three distinct but interconnected hypotheses tested in this study.

1. Higher levels of maternal depression exposure at age 1 year are linked to elevated dysregulated internal representations in preschool.

2. Harsh parenting, measured at age 1 year and developmentally across toddlerhood (age 1, 2, 3), mediates the relationship between early-occurring maternal depression and later dysregulated internal representations.

3. Child gender moderates maternal depression → harsh parenting → dysregulated internal representation relationship such that more robust mediation effects occur in girls.

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Method

Participants and Procedures

Participants ($N = 3,001$) were from the Early Head Start Research and Evaluation Project (EHSREP; Love et al., 2005), a 17-site, nationally representative longitudinal evaluation of the federally funded Early Head Start (EHS) programs. In accordance with the EHS eligibility criteria, study participation was restricted to those with family incomes at or below the federal poverty level. When participants enrolled in the study, half were randomly selected to receive EHS services. EHS programs were designed to promote early parenting and child development among families living in poverty via providing high-quality, comprehensive support services that promote positive child development and child-parent relationships. Though the participants in the control group did not receive EHS services, they could receive any other services. Study data collection consisted of home-based interviews that included observations and direct child assessments conducted when target children were approximately 1, 2, 3, and 5 years old.

The sample for this study consisted of 575 target children (294 girls; 281 boys) and their primary caregivers (99.7% biological mothers). We selected the 575 subsample of participants from the original 3,001 on the basis of whether or not the research site elected to administer the story stem narrative task during the 5 year interview. At the 5 year interview, girls' mean age was 61.99 months ($SD = 3.60$ months) and boys' mean age was 61.70 months ($SD = 4.26$ months). Twenty four percent of this sample was African American and reported a family gross income of approximately \$9,958.79 (*Median* = \$8,147.00; $SD = \$8,810.60$). For most, this number reflected a single adult income (69.2%, $n = 398$). Primary caregivers had a mean age of 22.82 years ($SD = 5.76$ years), and were primarily single (53.9%, $n = 310$), unemployed (52.5%, $n = 302$), and had received less than a high school diploma (47.1%, $n = 271$), at study enrollment.

Measures

Maternal depression. Maternal depression was assessed at the 14 month interview using the twelve item Center for Epidemiologic Studies Depression Scale - Short Form (CES-D-SF; Radloff, 1977). Using a four-point scale (0 = rarely/never; 1 = some/a little; 2 = occasionally/moderately; 3 = most/all days), mothers were asked to report the frequency of symptoms such as appetite loss, sadness, and tiredness during the week prior to the interview. Responses were summed and scores ranged from 0 to 36 ($\alpha = 0.86$; see Table 1).

Harsh parenting. Harsh parenting was assessed using two measures of negative parenting behaviors to capture a broader scope of the construct as reported by different informants. Observers' ratings of maternal *negative regard* came from a 10-minute videotaped, semi-structured observation of mother–child interaction, the Three-Bag task. Mothers were given three numbered cloth bags and were instructed to play with the bags in numerical order for ten minutes. Although mothers' behavior was coded on several parenting dimensions, for the purpose of this study we used negative regard only. The negative regard parenting scale assessed parent's expression of discontent with, anger toward, disapproval of, and/or rejection of their child. Videotapes were coded by an independent research team as part of the EHSREP protocol. Intercoder reliability percent agreement averaged 90% at the 14 month interview; 93% at the 24 month interview; 94% at the 36 month interview (Brady-Smith, Fauth, & Brooks-Gunn, 2005). Intraclass correlations ranged between 0.64 and 0.70 for coders across time points (Faldowski, Chazan-Cohen, Love, & Vogel, 2013).

Harsh parenting was further assessed using the *discipline index* from the Infant-Toddler version of the Home Observation for the Measurement of the Environment (HOME; Caldwell & Bradley, 1984) measures maternal discipline strategies when in potential conflict situations with the child. The interviewer asked the mother how she would handle each of these four situations:

1) Your child keeps playing with breakable things; 2) Your child refuses to eat; 3) Your child has a tantrum in a public place; 4) Your child got so angry that he/she hit you. The open-ended answers to each of the four scenarios were categorized into five types of discipline (0=no or 1=yes): use physical punishment; shout at the child; threaten the child with punishment; warn or send child to his/her room, or to timeout; prevent/distract, talk, or remove toy/item. For the purpose of the current study, the two verbal (shout at the child; threaten the child with punishment) and one physical punishment dichotomous variables were included. Participants who endorsed at least one of the two forms of verbal punishment received a verbal punishment composite score of '1'. Scores for participants who endorsed physical punishment were recoded to '2'. Recoded verbal and physical punishment scores were summed to create a 'newly' constructed discipline score, ranging from 0 to 3 (0 = no endorsement of any verbal or physical punishment; 1 = endorsed at least one form of verbal punishment; 2 = endorsed physical punishment; 3 = endorsed both verbal punishment and physical punishment).

Harsh parenting composite scores were created by multiplying mothers' negative regard scores from the Three-Bag assessment and 'newly' generated discipline scores. Scores were computed at three data waves (age 1, age 2, and age 3 years), and were included in the growth models. Harsh parenting composite scores ranged from '1' to '7' at ages 1 and 2 years, and from '1' to '8' at age 3 years (see Table 1).

Dysregulated internal representations. Dysregulated internal representations were measured via story stem narratives that assessed the emotional content of children's family representations during the 5 year interview. Seven emotionally-charged story stems were drawn from the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum, Emde, & MacArthur Narrative Group, 1990) and an additional story (Cooking/Band-Aid®) from the

Family Stories Task by Shamir, Schudlich, & Cummings (2001). In order of administration, the

stories were: Spilled Juice; Mom's Headache; Lost Keys; Hot Gravy; Stolen Candy;

Cooking/Band-Aid®; Departure; Reunion. Each stem consisted of a brief story beginning

presented with dolls and props, culminating in a moment when the child was invited to 'Show

me and tell me how your story ends'. The procedure (generally lasting 25-30 minutes) was

videotaped, and coded by four independent observers using the MacArthur Narrative Coding

Manual (Robinson et al., 2004). Following training and extensive discussion of disagreements on

specific cases, raters established an initial agreement level of 80% across codes for five cases.

Subsequently, each observer completed a reliability rating for every 10 cases and inter-observer

reliability was calculated based on intraclass correlation ($n = 63$).

　　　　We used story stem variables (i.e., dysregulated aggression; avoidance strategies;

dissociation; negative affect) as indicators of dysregulated internal representations that were

based on prior research by Schechter et al. (2007). *Dysregulated aggression* included aggression,

escalation of conflict, personal injury, danger, destruction, inappropriate child power, negative

parenting, harsh parental discipline, and negative story endings codes. The aggression code was

an average of four distinct aggressive themes: 1) verbal aggressive themes (e.g., "his brother

said, 'you're stupid'"); 2) physical aggression (e.g., "he got angry and pushed him down"); 3)

unmotivated/ dysregulated aggression (e.g., "he flew at him and knocked him and kicked him

like this and like this"); and 4) assaulting an adult (e.g., "the little boy knocked his mom over").

Avoidance strategies included codes that reflected the child 'stepping back' from the storyline in

a manner suggesting the need to de-intensify the drama (i.e., character self-exclusion, repetition,

family departure, sudden sleep onset) or reflected a note-worthy gap in the story construction

(i.e., denial of central story theme, passive refusal of empathy). *Dissociation* was reflected

when the child displayed dissociative themes or behaviors according to Macfie et al. (2001a; 2001b: e.g., intrusion of traumatic material, absorption/ boundary confusion, fleeing painful subject, spacing out, fantasy proneness, and identifying /over-involvement with aggressor). *Negative affect* consisted of three negative emotional expression codes (sadness; anger; fear), based on the child's verbal (e.g., "he's sad") and non-verbal responses (e.g., dolls are forcefully banged on table as child says "he got in trouble"), and also included displaying the emotions through facial (i.e., brow furrows indicative of the discrete emotions), and vocal intonation (e.g., "Mom said, 'you go to your room'" uttered with loud, forceful voice, or "he didn't know what to do" said with a hushed tone indicative of sadness).

Scores for each of the codes ranged from 0 (not present) to 1 (present) for the four scales. Exceptions were the aggression code, ranging from 0 to 4 (0 = no aggression); the denial code, ranging from 0 to 2 (0 = no denial, the child deals with the story as presented; 1 = child initially resists dealing with the story but then addresses it following prompt; 2 = child denies one or more central issue throughout the narrative), and the three negative emotion codes, ranging from 0 to 2 (0 = none; 1 = one instance; 2 = multiple instances). Prior to computing the mean scores of the four scales, we multiplied aggression scores by 0.25 and denial and negative emotion scores by 0.5 to ensure similar scoring ranges (0-1) across all codes for dysregulated aggression; avoidance strategies; dissociation; negative affect. The codes reflected in each of the four indicators (dysregulated aggression; avoidance strategies; dissociation; negative affect) were summed and averaged across the eight story stems. Final scores for the four dysregulated internal representation indicators ranged from 0 to 1 with an alpha of 0.78 across the four indicators (see Table 1).

Control variables. At the start of the study, mothers provided demographic and child

temperament scores that were used as covariates. Basic demographics included child age,

race/ethnicity (1 = African American), and five maternal demographics used as risk indicators.

Maternal risk scores were summed from these five dichotomous variables: low education (< high

school diploma); single parenthood; adolescent parenthood; unemployment; and welfare status.

Child temperamental negative emotionality (5 items, $\alpha = 0.73$) was assessed using the

emotionality subscale of the Emotionality, Activity, Sociability, and Impulsivity Temperament

Survey (EASI; Buss & Plomin, 1984). We included negative emotionality of its association with

how a child reacts in stressful situations, which has been linked to attachment in previous

research (Kochanska & Coy, 2002). Child negative emotionality describes individual differences

in emotions observed through immediate reactions, and includes elements of effortful control

that inhibit a dominant response in order to engage in a less dominant responses (Posner &

Rothbart, 2000). High scores on the scale indicate more negative emotionality of the observed

child. Scores ranged from 1 to 5 (see Table 1).

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Data Analyses

All hypothesis testing used a moderated mediation analysis in latent growth curve

modeling with child gender as a categorical moderator (multiple-group). The first hypothesis was

tested by examining the direct effects of early-occurring maternal depression at age 1 year to

dysregulated internal representations at age 5 years adjusted for harsh parenting intercept and

slope mediators. The second hypothesis was tested by generating mediation effects of harsh

parenting on the relationship between early-occurring maternal depression scores and dysregulated internal representations. These first two hypotheses only examined direct and indirect parameter estimates for boys and girls. Whereas, the latter hypothesis tested model differences within and across groups by implementing parameter comparisons. The first part of the third hypothesis was tested by comparing the magnitude between effects within boys and girls. The second part of the third hypothesis was tested by comparing model parameter estimates of direct and indirect effects across gender groups.

  Statistical analyses. Statistical analyses were conducted using M*Plus* version 7 (Muthén & Muthén, 1998-2012). Dysregulated aggression, avoidance, dissociation, and negative affect representations were examined as manifestations of dysregulated internal representation latent construct. All indicators loaded above the 0.5 level in both boys ($\lambda = 0.61$ to 0.81) and girls ($\lambda = 0.53$ to 0.80) models, which supports the factor structure of the latent construct (Hair, Black, Babin, & Anderson, 2009). To evaluate the model-data fit, we used chi-square values (χ^2/df), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean residual (SRMR). The general cutoffs for accepting a model were less than 3 for χ^2/df, equal to or greater than 0.90 for CFI and TLI, equal to or less than 0.05 for the RMSEA, and less than .08 for the SRMR (Hu & Bentler, 1999).

  To test mediational effects, we implemented a commonly used approach to test for mediation, known as, the product of coefficients method (MacKinnon, 2008). This approach calculates the point estimate of the mediated effect as the product of coefficients, *ab*, and obtains standard errors and confidence intervals. A causal chain is determined when the confidence interval does not contain zero, indicating a mediational effect of M in the association between X and Y.

Four primary equations were computed for parameter comparisons: (1) the difference of direct and indirect effects ($c' - b*a$) within gender groups; (2) the difference of indirect and indirect effects ($b - a$) within gender groups; (3) the difference of indirect effects ($b*a - b*a$) across groups; (4) the difference of direct effects ($c' - c'$) across groups. Because standardized parameter estimates for model comparisons in complex latent variable models cannot be estimated in M*Plus*, unstandardized coefficients and standard errors, including bias-corrected confidence intervals using a bootstrapping procedure with replacement (b = 5000), were calculated.

Missing data. Potential differences between the sample with complete and incomplete data across the three waves of data were examined. Given the interest of gender differences, we examined potential bias in missingness by gender (boys vs. girls) using group difference tests for the missing versus nonmissing samples. The nonmissing sample was defined as those families who had valid waves of data for covariates, such as maternal demographic risk and child negative emotionality, maternal depression at age 1, and harsh parenting at age 1, age 2, and age 3. Missing data analyses of child gender between the included and excluded sample was not significant on maternal demographic risk ($\chi^2(1) = 1.62$, $p = 0.20$), child negative emotionality ($\chi^2(1) = 1.15$, $p = 0.28$), maternal depression at age 1 ($\chi^2(1) = 0.65$, $p = 0.42$), harsh parenting at age 1 ($\chi^2(1) = 0.72$, $p = 0.40$), age 2 ($\chi^2(1) = 1.89$, $p = 0.17$), and age 3 ($\chi^2(1) = 0.03$, $p = 0.86$). Non-significant differences suggest that patterns of missing data were not systemically related to key variables. In order to obtain the maximum number of cases, missing data were imputed using full information maximum likelihood (FIML) estimation, a widely adopted multiple imputation approach to accommodate missing data (Schafer & Graham, 2002).

Results

Table 2 provides bivariate correlations between all key variables for girls and boys. For both boys and girls, maternal depression at age 1 was associated with harsh parenting at each data wave across toddlerhood. In the boys group only, maternal depression at age 1 year was associated with dissociation and negative affect at age 5 years. For girls, harsh parenting at age 1 year was associated with avoidance and dissociation at age 5 years. Harsh parenting at age 2 and 3 years was marginally related to dissociation at age 5 years and harsh parenting at age 3 only was associated with negative affect at age 5 for boys. Harsh parenting at age 2 and 3 years was related to girls' dissociation and negative affect representations at age 5 years.

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Discernible differences were found between boys' and girls' story stem narratives. Boys demonstrated significantly higher levels of dysregulated aggression, avoidance strategies, and dissociation in their story stem narratives. Though no group differences were found in negative affect composite scores, when examined at the item level girls had significantly higher sadness scores and moderately lower anger scores than boys.

Moderated Mediation Analysis in Latent Growth Curve Modeling

The hypothesized moderated mediation in a latent growth curve model with child gender as a categorical moderator had good model-data fit, $\chi^2/df = 1.80$, *CFI* = 0.94, *TLI* = 0.93, *RMSEA* = 0.05, *SRMR* = 0.07 (see Figure 2). In presenting the results, we address the findings for each hypothesis described earlier.

Relations between maternal depression and dysregulated representations. Before examining mediational effects of harsh parenting, direct effects were estimated. For both boys

and girls, early-occurring maternal depression at age 1 year related to initial level harsh parenting (intercept) that was measured at the same time (boys: $\beta = 0.22$, $p < 0.001$; girls: $\beta = 0.26$, $p < 0.001$). A significant link between higher levels of early-occurring maternal depression and harsh parenting growth (linear slope) across toddlerhood ($\beta = 0.29$, $p < 0.001$) also emerged for girls. In addition, initial harsh parenting and dysregulated internal representations at age 5 were significantly related for both boys ($\beta = 0.28$, $p < 0.001$) and girls ($\beta = 0.26$, $p < 0.001$). The increased rate of growth in harsh parenting trajectories across toddlerhood was also related to dysregulated internal representations at age 5 years ($\beta = 0.11$, $p = 0.003$) for girls but not for boys. The direct link between maternal depression at age 1 and dysregulated internal representations at age 5 years was significant for boys ($\beta = 0.13$, $p = 0.009$) but not for girls. No direct effect emerged between maternal depression at age 1 and girls' dysregulated internal representations at age 5 years ($\beta = -0.08$, $p = 0.17$).

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Harsh parenting as mediating the effects of maternal depression on dysregulated representations. Table 3 presents unstandardized estimates of the mediation effects generated from calculating the product of *ab* pathways, with bootstrapping confidence intervals. For boys, the 95% bootstrap confidence interval for mediation effect of harsh parenting intercept does not contain zero (b = 0.004 [.003, .005]), indicating a significant mediation effect of initial harsh parenting in the relationship between maternal depression and dysregulated internal representations. Likewise, for girls, the harsh parenting intercept was a significant mediator between the association as represented by zero omitted from the 95% bootstrap confidence

interval (b = 0.038 [.025, .064]). For both boys and girls, concurrent exposure to maternal

depression and harsh parenting was associated with higher levels of dysregulated internal

representations in preschool. Girls also demonstrated a significant mediational effect of the harsh

parenting (slope) across toddlerhood (b = 0.018 [.005, .023]). No mediation effect of harsh

parenting growth in the relation between maternal depression and dysregulated internal

representations emerged for boys.

Child gender as moderating relations between harsh parenting, maternal depression

and dysregulated representations. The third study hypothesis was tested by examining whether

this mediation effect was conditional upon child gender (see Table 3). In the boys model,

parameter comparisons revealed a significant difference between the direct effect of maternal

depression to dysregulated internal representations and the indirect effect of maternal depression

to dysregulated internal representations via harsh parenting slope (b = 0.010 [.007, .011]). The

positive coefficient indicates a stronger direct effect than indirect effect via harsh parenting

slope. Although the parameter estimate comparing boys direct effect and indirect effect via harsh

parenting intercept was not significant (b = 0.005 [.002, .008]), the bootstrapping interval did not

contain zero suggesting a marginally stronger direct effect. A significant difference in magnitude

between the harsh parenting intercept and slope indirect effects emerged for boys (b = 0.005

[.003, .006]). The positive coefficient suggests a stronger indirect effect via harsh parenting

intercept than the harsh parenting slope.

Within the girls model, a significant difference between the direct effect of maternal

depression to dysregulated internal representations and the indirect effect via harsh parenting

intercept (b = -0.084 [-.163, -.049]) emerged. Comparison of direct effect and indirect effect via

harsh parenting slope was significant at the 0.09 level (b = -0.063 [-.122, -.024]) with zero

omitted from the 95% bootstrapping interval, suggesting a marginal difference between these effects for girls. These negative coefficients suggest stronger indirect effects via harsh parenting intercept and slope than direct effect of maternal depression to dysregulated internal representations. Girls' demonstrates more robust harsh parenting mediational effects in the relationship between maternal depression and dysregulated internal representations compared with direct links. However, comparison of indirect parameters within the girls model found a stronger indirect pathway of initial harsh parenting than growth across toddlerhood (b = 0.021 [.016, .041]). These findings suggest that in early toddlerhood, girls are more vulnerable to stressors in the early caregiving environment.

The final step of the third hypothesis was tested by comparing effects across gender groups. Parameter comparisons found stronger indirect effects via harsh parenting intercept (b = -0.034 [-.057, -.019]) and slope (b = -0.018 [-.022, -.012]) for girls, when compared with similar indirect effects for boys. The direct effect of maternal depression to dysregulated internal representations was found marginally more robust for boys than girls (b = 0.055 [.014, .109]). These findings suggest that boys exposed to early-occurring maternal depression had more dysregulated representations compared with their girl counterparts. However, girls' who experienced higher levels of harsh parenting across toddlerhood were more vulnerable to the effects of early-occurring maternal depression on their representations, expressing more disruptive effects from the hypothesized mediational pathways to later internal representations compared with boys.

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Insert Table 3

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Discussion

This study was designed to longitudinally examine whether harsh parenting mediates the association between early-occurring maternal depression and children's dysregulated internal representations of attachment relationships in preschool and whether these pathways differ for boys and girls. Growth curve modeling confirmed relations among early-occurring maternal depression, harsh parenting, and dysregulated internal representation. Harsh parenting undermined the links between early-occurring maternal depression scores and dysregulated internal representations across genders. However, vulnerability to dysregulated internal representations was a function of the child gender. That is, when compared between gender groups, maternal depression differently affected children's dysregulated internal representations depending on child gender.

Gender Differences in Story Stem Narratives

Girls exposed to increasingly harsh parenting had response patterns characterized by negative affect, specifically exhibiting more intense expressions of sadness. Boys, on the other hand, who were exposed to harsh parenting, demonstrated more behavioral dysregulation and anger in their narratives, as well as, withdrawal from conflictual situations. Findings can be interpreted in the context of the emotion socialization literature, which suggests that parents have expectations for the ways in which boys and girls should behave based on gender role differentiation (Brody & Hall, 1993; Klimes-Dougan et al., 2007). These gender differences in expressions of affect likely reflect the differentiated expectations of how girls and boys should express emotions. Fivush et al. (2000) stated that girls may be more socialized to express emotions of sadness. Both mothers and fathers were found to engage in conversations regarding the emotional context and causes of sadness more with girls than with boys. Alternatively, boys

have been found to be discouraged from expressing highly vulnerable emotions such as sadness

and fear (e.g., Eisenberg et al., 1999). As a result, boys may be socialized to learn to avoid or

dissociate from emotional conflict, whereas, girls have been discouraged from doing so (Zahn-

Waxler, 2000). However, differences also likely reflect the differential pathways in the effects of

maternal depression and harsh parenting on boys' and girls' representations.

Differential Mechanistic Pathways between Maternal Depression and Representations

        Aside from the differences in boys' and girls' articulation of affect in their narrative

responses, the pathways between early-occurring maternal depression, harsh parenting, and later

dysregulated internal representations were significantly different for boys and girls. Early-

occurring maternal depression was directly related to boys' dysregulated internal representations

in preschool, but, for girls, the effects of maternal depression were mediated by harsh parenting.

Boys were more affected by maternal depression at age 1 year, which has a direct effect on boys'

less secure internal representations of attachment relationships. These findings are in line with

other research suggesting that boys tend to display externalizing behaviors in the context of

maternal depression (Campbell et al., 1996), and are generally more vulnerable to the direct

effects of maternal depression (e.g. Hay et al., 2001; Sharp et al., 1995; Sheeber, Davis, & Hops,

2002). For example, Gross and colleagues (2008) found that maternal depression contributed to

greater dysregulated behaviors in boys as compared with girls during the transition to school

period, between ages 5 and 6 years. This study had also found that boys' internal representations

of attachment relationships were more dysregulated when mothers' felt a sense of helplessness in

early toddlerhood. Mothers with greater depressive symptoms demonstrated a lack of emotional

availability, which was detrimental to the consistency of parenting behaviors. By disrupting the

context in which the development of emotional regulation occurs, which, in turn, relates to the

quality of attachment (Zimmermann, 1999), may be particularly detrimental for males because young boys have less well-developed emotional regulation processes than their girl counterparts (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Matthews, Ponitz, & Morrison, 2009). A recent study by Viddal et al. (2015) provided further evidence of this link between attachment and self-regulation in boys finding attachment security to promote the development of boys' regulatory mechanisms. Thus, attachment-related narratives may impact the inability to regulate emotions (Stadelmann et al., 2007), evoking more dysregulated representations in boys as a result of exposure to early-occurring maternal depression.

Our results also found harsh parenting as a mediating process between early-occurring maternal depression and girls' dysregulated internal representations of attachment relationships. The effects of maternal depression on harsh parenting may be due to a lack of emotional availability, impacting the effectiveness of the parent-child relationship as a context in which young children can development emotional regulation skills (Kopp, 1982; Maccoby & Martin, 1983; McCauley, Kendall, & Pavlidis, 1995). The parent's difficulty in supporting the child's emotion regulation creates an environment of sustained threat to the child and impacts how the child responds to harsh parenting behaviors (Scheeringa & Zeanah, 2001). When early incidents of harsh parenting occur and contribute to internalized feelings of anger and aggression in young children, mothers show greater degrees of disapproval for girls even during the earliest stages of development (Zahn-Waxler & Polanichka, 2004). Because girls are already socialized to be more sensitive to the nuances of emotional communication (Buckner & Fivish, 1998; Fivush, Brotman, Buckner, & Goodman, 2000), they are likely more attuned to maternal emotional distress and harsh disciplinary practices (Fivush et al., 2000; Klimes-Dougan et al., 2007).

Girls are also more likely to be punished for aggressive behavior, and as a result learn to adapt their behaviors in an effort to maintain the relationship (Zahn-Waxler, 2000). This draws on the most basic tenets of attachment theory, which posits that the primary goal of the very young child is to keep the attachment figure present and available (Bowlby, 1969). Over time, young girls may learn that dampening their behaviors and internalizing their experiences may be effective in maintaining close proximity with their mothers. Young girls may also harbor a sense of responsibility for the conflict relationship with their mothers, contributing to increased subjective distress, which is linked to internalizing problems (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Previous research has stated that these early indicators of internalizing difficulties, evidenced in young girls' story stem narratives, likely become more pronounced as girls get older, and when gender differences in psychopathology tend to emerge (Zahn-Waxler et al., 2008).

Implications

For both boys and girls, cumulative exposure to stressors in the rearing environment by the first year of life appears to have a negative effect on later internal representations. Prior work has demonstrated that early exposure to maternal depression and harsh parenting may alter the developmental course by initially disrupting the mother-child attachment relationship, which increases the child's vulnerability to development of adverse outcomes. These early experiences may lead to distorted representational models that put the child at risk for impaired subsequent attachment relationships. According to attachment theory and research, the additive effect of exposure to early-occurring maternal depression followed by exposure to concurrent harsh parenting may promote fearful behaviors and thoughts that the world is unsafe. Early

interventions aimed at promoting positive parenting in toddlerhood may reduce the possibility of developing socioemotional problems following exposure to additional environmental stressors.

Particularly, the findings suggest that the mechanism by which early maternal depression and harsh parenting affect later dysregulated internal representations differ between boys and girls. Based on these findings, early intervention services may consist of integrated, broad-based supports, such as attachment-based parenting intervention programs and mental health services, to promote optimal early parenting. Attachment-based parenting targets the direct support of sensitive, emotionally-supportive parenting behaviors that links to children's secure internal representations. Attachment-based parenting interventions, specifically, promote early parenting strengths while identifying potential risks to the parent-child relationship for which to intervene. Supporting the development of early parent-child attachment relationships, through targeted, individualized, early intervention services may assist high-risk children in acquiring appropriate behaviors that influence long-term success.

Limitations and Conclusions

Despite the many strengths of this study, it is important to note some limitations. The analysis of preexisting data restricted the examination of all key predictors at multiple data waves. Although other studies have found maternal depression to remain quite stable across the early childhood years (e.g., McLennan, Kotelchuck, & Cho, 2001; Ramos-Marcuse et al., 2010), this study could not examine the potential developmental effects of maternal depression. Inter-rater reliabilities of examiners' ratings of maternal discipline strategies via mothers' unstructured description of her discipline were also not estimated. Future studies should examine associations between patterns of early maternal depression and harsh parenting measured at multiple time points across toddlerhood and effects on children's dysregulated internal representations.

Moreover, confounding behavioral mechanisms and school readiness skills should also be further explored in relation to dysregulated story stem responses. Preschool is a pivotal time for narrative skill development and dysregulated, incoherent story stem responses may indicate early language delays. Research has found individual differences across dysregulated representations and effects on developmental delays. Kelly (2015) found that children with dysregulated representations that contained more aggressive and negative emotions, such as anger, were at risk for delayed discourse, whereas, children with dysregulated representations that contained more avoidant strategies were not. Previous studies also found that children with similar dysregulated representations to those at risk for delayed discourse were at greater risk for developing externalizing and internalizing behavior problems (e.g., Oppenheim, 2006). Future studies are warranted to examine differences among dysregulated representations on long-term outcomes.

As indicated, internalized perceptions of early attachment relationships contribute to the evolving representational models about how and when emotions are expressed and how one should respond to subsequent stressful situations, such as conflicts and misbehaviors occurring in the family system. Internal representational models provide a window into how positively or negatively children have internalized their early experiences. The current study contributes to the existing literature on the processes through which early maternal depression and harsh parenting influence children's later dysregulated internal representations of attachment relationships in gender specific ways.

Author Note

Address correspondence to: Tiffany L. Martoccio, University of Maryland School of Social Work, 525 West Redwood Street, Baltimore, MD 21201, tmartoccio@ssw.umaryland.edu.

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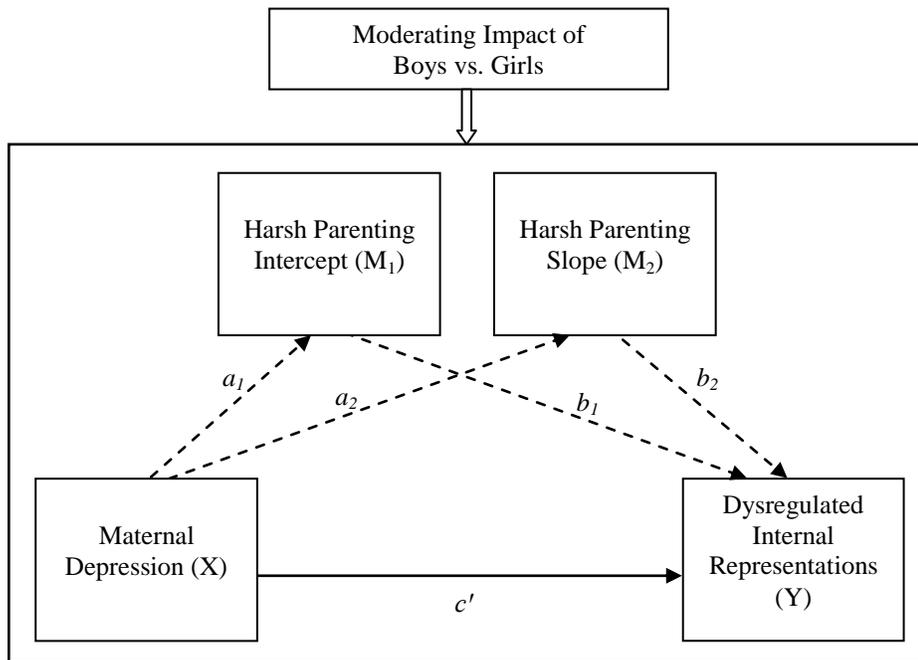
Figure 1. The hypothesized moderated mediation analysis in latent growth curve modeling with child gender as a categorical moderator (multi-group). *Note.* Latent structures omitted for simplicity; Solid lines are direct effects and dashed lines are indirect effects; X = independent variable: maternal depression, age 1; M = mediator variable: harsh parenting (M_1 = intercept, age 1; M_2 = slope [linear growth], age 1 to age 3); Y = dependent variable: children's dysregulated internal representations (latent factor), age 5.

Table 1

Descriptive statistics for key variables by child gender

	Full Sample ($N = 575$)	Boys ($n = 281$)	Girls ($n = 294$)	Test of Group Differences
Child age (months)	14.84 (1.30)	14.85 (1.22)	14.84 (1.37)	$t(573) = 0.09$
Race/Ethnicity (1=*African American*)	24%	23%	25%	$\chi^2(1) = 0.33$
Maternal demographic risk	2.60 (1.12)	2.58 (1.11)	2.63 (1.13)	$t(573) = -0.58$
Negative emotionality	2.94 (0.88)	2.94 (0.88)	2.94 (0.88)	$t(573) = 0.04$
Maternal depression (age 1)	8.39 (6.33)	8.48 (6.05)	8.30 (6.60)	$t(573) = 0.34$
Harsh parenting (age 1)	1.99 (1.03)	2.09 (1.11)	1.90 (0.94)	$t(573) = 2.12*$
Harsh parenting (age 2)	2.22 (1.26)	2.28 (1.31)	2.16 (1.21)	$t(573) = 1.11$
Harsh parenting (age 3)	2.30 (1.23)	2.27 (1.26)	2.33 (1.19)	$t(573) = -0.58$
Dysregulated aggression (age 5)	0.10 (0.07)	0.12 (0.08)	0.09 (0.06)	$t(573) = 5.00*$
Avoidance (age 5)	0.17 (0.08)	0.18 (0.07)	0.16 (0.08)	$t(573) = 2.93*$
Dissociation (age 5)	0.06 (0.06)	0.07 (0.07)	0.05 (0.05)	$t(573) = 4.77*$
Negative affect (age 5)	0.15 (0.10)	0.15 (0.11)	0.15 (0.10)	$t(573) = -0.34$

Note. Standard deviations are in parentheses.
*$p < .05$.

Table 2

Bivariate correlations between key variable by child gender

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Child age	---	-.10†	-.09	.03	.10†	.02	-.01	-.02	.10†	.07	.07	.01
2. Race/Ethnicity	-.09	---	.20*	-.01	.03	.30*	.25*	.27*	.04	.07	.11†	.07
3. Maternal demographic risk	.01	.06	---	-.05	.08	.20*	.20*	.18*	.06	.18*	.13*	.05
4. Negative emotionality	.06	-.03	.03	---	.30*	.13*	.10†	.11†	-.08	.01	.00	.07
5. Maternal depression (age 1)	-.01	.02	.05	.04	---	.24*	.15*	.26*	-.01	-.03	-.01	.07
6. Harsh parenting (age 1)	-.14*	.22*	-.07	.05	.12*	---	.40*	.29*	-.00	.13*	.16*	.09
7. Harsh parenting (age 2)	-.02	.24*	.08	-.04	.14*	.39*	---	.40*	.07	.11†	.21*	.13*
8. Harsh parenting (age 3)	-.07	.39*	.03	-.06	.16*	.34*	.42*	---	.09	.07	.12*	.15*
9. Dysregulated aggression (age 5)	.07	.02	-.05	-.03	.08	.07	.05	.09	---	.39*	.53*	.59*
10. Avoidance (age 5)	-.00	.01	.04	-.02	.07	-.03	-.03	.05	.43*	---	.50*	.42*
11. Dissociation (age 5)	.01	.09	.07	-.15*	.13*	.04	.10†	.11†	.59*	.41*	---	.55*
12. Negative affect (age 5)	.03	.10	-.01	-.03	.15*	.09	.09	.18*	.62*	.45*	.53*	---

Note. Correlations below the diagonal are for boys, correlations above the diagonal are for girls.
†*p* < .10; *p* < .05.

Table 3

Unstandardized comparisons of parameter estimates

Model Constraint	Boys (n = 281)			Girls (n = 294)		
	b	SE	(95% CI[a])	b	SE	(95% CI[a])
Effects from maternal depression, age 1, to dysregulated internal representations, age 5						
Indirect effects via harsh parenting intercept (b_1*a_1)	.004*	.001	(.003, .005)	.038*	.012	(.025, .064)
Indirect effects via harsh parenting slope (b_2*a_2)	.000	.000	(-.010, .008)	.018*	.005	(.005, .023)
Comparison between direct and indirect via harsh parenting intercept effects ($c' - b_1*a_1$)	.005	.004	(.002, .008)	-.084*	.043	(-.163, -.049)
Comparison between direct and indirect via harsh parenting slope effects ($c' - b_2*a_2$)	.010*	.004	(.007, .011)	-.063†	.037	(-.122, -.024)
Comparison between indirect and indirect effects ($b_1*a_1 - b_2*a_2$)	.005*	.001	(.003, .006)	.021*	.009	(.016, .041)
			Comparison across Child Gender			
Comparison of indirect effects via harsh parenting intercept across groups ($b_{1b}*a_{1b} - b_{1g}*a_{1g}$)	-.034*	.012	(-.057, -.019)			
Comparison of indirect effects via harsh parenting slope across groups ($b_{2b}*a_{2b} - b_{2g}*a_{2g}$)	-.018*	.005	(-.022, -.012)			
Comparison of direct effects across groups ($c'_b - c'_g$)	.055†	.033	(.014, .109)			

Note. [a] Bootstrapping based confidence interval (CI); b = unstandardized coefficient; SE = standard error for the unstandardized coefficient; (95% CI) = lower and upper limits of the 95% confidence interval for the unstandardized coefficient; a = the relation of maternal depression to harsh parenting (mediators); b = the relation of harsh parenting (mediators) to dysregulated internal representations adjusted for maternal depression; c' = the relation of maternal depression to dysregulated internal representations adjusted for harsh parenting (mediators).
†$p < 0.10$; *$p < 0.05$.
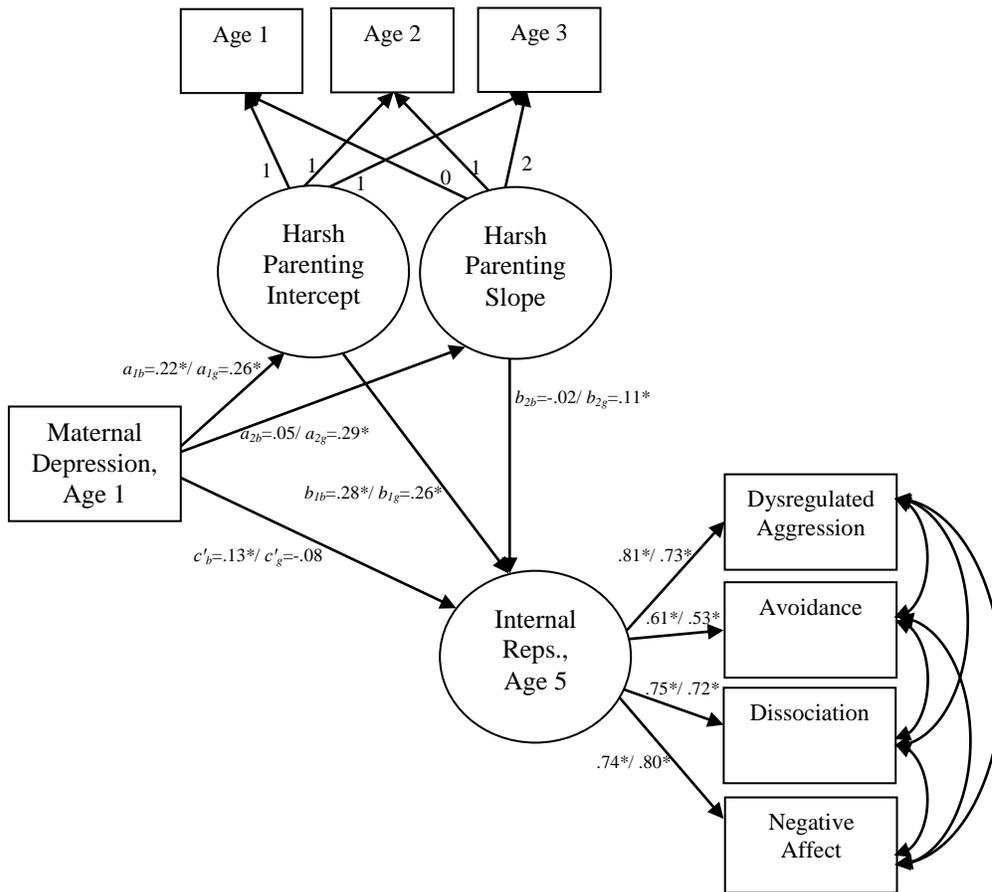
Figure 2. Harsh parenting mediates between early maternal depression at age 1 and children's dysregulated internal representations at age 5 for boys and girls samples (standardized (β) coefficients). Values before the slash are parameter estimates for the boy sample. Values after the slash are parameter estimates for the girl sample.

*$p < .05$.