

Maternal and Paternal Predictors of Child Depressive Symptoms: An Actor-Partner Interdependence Framework

Kyle W. Murdock^{1,2,3} · Laura D. Pittman² · Christopher P. Fagundes¹

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Abstract Family members are theorized to influence each other via transactional or systems related processes; however, the literature is limited given its focus on mother–child relationships and the utilization of statistical approaches that do not model interdependence within family members. The current study evaluated associations between self-reported parental affect, parenting behavior, and child depressive symptoms among 103 mother–father–child triads. Children ranged in age from 8 to 12 years. Higher maternal negative affect was associated with greater maternal and paternal harsh/negative parenting behavior. While maternal negative affect was directly associated with child depressive symptoms, paternal negative affect was indirectly associated with child depressive symptoms via paternal harsh/negative behavior. In a separate model, maternal positive affect was indirectly associated with child depressive symptoms via maternal supportive/positive behavior. These results highlight the importance of simultaneously modeling maternal and paternal characteristics as predictors of child depressive symptoms.

Keywords Parent–child relations · Family process · Development · Triadic data · Affect/emotion

Introduction

Children of parents with emotional difficulties are at risk for mental health problems. Indeed, parental distress has an enduring negative effect on children’s depression (Brown et al. 2015). Given that childhood depression is associated with an increased risk of mental health problems in adulthood, understanding emotional processes within families is important (Waszczuk et al. 2015). Prior work suggests that associations between maternal and paternal emotions and behaviors are best understood from a dyadic perspective (e.g., Murdock et al. 2014); however, the role of mothers and fathers in predicting childhood depression within families is relatively understudied given that the literature has largely focused on mother–child and mother–father associations.

Parents are thought to influence child outcomes not only through modeling emotional behavior (Gerull and Rapee 2002), but through the parenting behaviors associated with parental affect (Dette-Hagenmeyer and Reichle 2014; Silberg et al. 2010; Wilson and Durbin 2010). Dix (1991) hypothesized that when goals for the parent–child relationship are not met, both parents and children would be likely to experience affective difficulties. Parents with high negative affect (i.e., distress) were hypothesized to engage in more harsh/negative parenting behaviors than those with low negative affect (Dix 1991). Parents with low positive affect (i.e., energy and engagement in one’s environment) were thought to engage in fewer supportive/engaged parenting behaviors than parents with high positive affect (Dix 1991). Importantly, positive and negative affect are independent dimensions of emotionality as opposed to being differing ends of the same dimension (Watson et al. 1988), and Dix (1991) theorized that these affect dimensions would be differentially associated with parenting behavior.

✉ Kyle W. Murdock
kyle.murdock@psu.edu

¹ Department of Psychology, Rice University, Houston, TX, USA

² Department of Psychology, Northern Illinois University, DeKalb, IL, USA

³ Department of Biobehavioral Health, The Pennsylvania State University, State College, PA, USA

Such hypotheses have been supported in a meta-analytic study of mothers and fathers (Rueger et al. 2011) which indicated that self-reported parental negative affect was associated with self- and other-reports of harsh/negative parenting behavior whereas self-reported parental positive affect was associated with self- and other-reports of supportive/positive parenting behavior among community samples of parents. Moreover, Dix (1991) indicated that parental emotions may influence child outcomes both directly and indirectly via parenting behaviors.

Much of the literature examining associations between parent and child mental health have focused on depression. Indeed, higher parental depressive symptoms are associated with greater child depressive symptoms across all stages of child development (Dette-Hagenmeyer and Reichle 2014; Goodman et al. 2011; Ramchandani et al. 2008). Furthermore, greater harsh/negative parenting behavior is associated with higher child depressive symptoms (Baker and Hoerger 2012; Bayer et al. 2008). Lower supportive/positive parenting behaviors are also associated with greater child depressive symptoms (Bruce et al. 2006; Hopkins et al. 2013), indicating that multiple dimensions of parenting behavior are important in predicting child depressive symptoms. Importantly, parental emotions and behavior can impact childhood outcomes even among those parents who do not have a history of psychiatric disorders (e.g., Johnson et al. 2001), which highlights the importance of utilizing dimensional measures of parental emotionality.

Parenting behaviors link parent and child mental health. Harsh/negative maternal behaviors explain the association between maternal and child depressive symptoms (Bifulco et al. 2002; Dette-Hagenmeyer and Reichle 2014; Johnson et al. 2001; Lim et al. 2011). Less is known about how harsh/negative paternal behaviors may explain the relationship between paternal and child depressive symptoms. One study demonstrated that paternal depressive symptoms were associated with greater inter-parental conflict, which led to increased maternal harsh/negative behavior and child depressive symptoms (Lim et al. 2011). Thus, the ways in which maternal and paternal characteristics are interrelated is important; however, few studies have examined maternal, paternal, and child characteristics simultaneously. It is important to address this limitation in the literature as family systems theory indicates that mother–child relationships are best understood when considering other aspects of the family system (Cummings et al. 2005; Minuchin 1985; Thomassin et al. 2015).

A second limitation is that researchers have often modeled parental characteristics as independent, which is very unlikely given that emotions and behaviors are interrelated among those in romantic and familial relationships (Barnett et al. 2008; Fagundes et al. 2012; Kenny et al. 2006; Murdock et al. 2014). In the rare cases that data for both

mother and father characteristics is collected, researchers have historically created a composite index (e.g., Dougherty et al. 2013; Elgar et al. 2007) or evaluated mothers and fathers in separate models when predicting child outcomes (e.g., Dette-Hagenmeyer and Reichle 2014; Harold et al. 2012). This approach does not allow one to examine how maternal and paternal characteristics may be interrelated in their prediction of child outcomes.

There are only a few studies that simultaneously examined maternal and paternal characteristics within families (see Gutierrez-Galve et al. 2015). In regards to parental affect, results have indicated that higher self-reported maternal negative affect is associated with greater self-reported maternal and paternal harsh/negative parenting behavior, while greater self-reported paternal negative affect is associated with greater self-reported paternal harsh/negative parenting behavior only (Murdock et al. 2014). The study did not evaluate parental affect and behavior as predictors of child outcomes. Furthermore, maternal depressive symptoms are both directly and indirectly associated with child internalizing problems through maternal harsh/negative behavior, whereas paternal depressive symptoms are indirectly associated with child internalizing problems through maternal harsh/negative behavior (Lim et al. 2011). Therefore, relatively few studies have attempted to analyze associations between emotions and behavior among mothers, fathers, and children, leading to a sizable gap in the literature.

The present study extends the literature by evaluating associations between maternal and paternal characteristics in the prediction of child depressive symptoms using an actor-partner interdependence framework. In addition, the present study extends the literature by evaluating the dimensions of parental affect and behavior theorized by Dix (1991) to be associated with child mental health outcomes, which is important given that emotions and behaviors can impact child depression among non-clinical samples of mothers and fathers (Johnson et al. 2001), and affect dimensions among parents are differentially associated with various parenting behaviors (e.g., Rueger et al. 2011). We hypothesized that higher maternal negative affect would be associated with greater maternal and paternal harsh/negative behavior given prior findings using an actor-partner interdependence model (Murdock et al. 2014). Such models allow one to examine actor effects (i.e., within person associations) and partner effects (i.e., across person associations; Cook and Kenny 2005; Kenny et al. 2006). It was also expected that higher paternal negative affect would be associated with greater paternal harsh/negative behavior. Additionally, higher maternal positive affect was expected to be associated with greater maternal supportive/positive behavior, and higher paternal positive affect was hypothesized to be associated with greater paternal supportive/

positive behavior. In line with Dix's (1991) theoretical model of the affective organization of parenting, we hypothesized that greater harsh/negative maternal and paternal behaviors would partially explain associations between higher maternal and paternal negative affect and greater child depressive symptoms. Moreover, we hypothesized that higher maternal and paternal supportive/positive parenting behaviors would explain associations between greater maternal and paternal positive affect and lower child depressive symptoms.

Method

Participants

One hundred and eight mother–father–child triads participated in the current study. Five families were removed from the analyses due to non-random missing data (e.g., a parent not completing an entire measure; $n = 1$), non-matching data (i.e., one parent completing questionnaires when thinking about one child in the home, and the other parent completing questionnaires when thinking about another child in the home; $n = 1$), or potentially dishonest responding (e.g., selecting the same answer repeatedly throughout at least one measure; $n = 3$). Thus, the final sample consisted of 103 families.

Prior to collecting data, a power analysis was conducted to ensure that our proposed sample was sufficient. Power within actor-partner interdependence models using structural equation modeling differs from traditional models. As a result, traditional power analyses cannot be utilized when testing dyadic data as power is increased when utilizing such samples (e.g., Kenny et al. 2006). As such, Kenny et al.'s (2006) recommendations were utilized to determine sample size. Using Satorra and Saris' (1985) method for computing power in covariance structure models as an outline, we had 84% power to detect a significant effect of .20 with a sample size of 100 families. Given previous evidence of effect sizes greater than .20 for the hypothesized associations (e.g., Murdock et al. 2014), our sample size was sufficient.

Children ranged from 8 to 12 years of age ($M_{age} = 10.12$; $SD = 1.52$) and 52.4% of the children who participated were female. For families characterized by having multiple children between the ages of 8 and 12, the research team alternated between selecting the youngest and oldest child within the age range to participate in the study. Mothers ranged in age between 26 and 52 years ($M_{age} = 38.28$; $SD = 6.51$) and fathers ranged in age between 26 and 60 ($M_{age} = 40.51$; $SD = 7.07$). Mothers predominantly identified their ethnicity as Caucasian (67.6%; 19.0% African-American; 4.8% Hispanic; 8.6% other). Fathers also

predominantly identified their ethnicity as Caucasian (69.3%; 21.8% African-American; 3.0% Hispanic; 5.9% other). Most parents self-reported being in an intact marital relationship (67.7%; 32.3% cohabitating). The majority of mothers (98.1%) and fathers (69.4%) indicated that they were the child's biological parent. Total family income ranged from \$0 to \$250,000 ($M_{income} = \$78,478.65$; $SD = \$49,932.23$). Mothers were generally well educated as 35.3% self-reported obtaining a college degree (32.4% some college; 19.6% graduate degree; 6.9% high school degree; 3.9% trade or technical degree; 2.0% less than high school degree). For fathers, 30.6% self-reported obtaining a college degree (23.5% some college; 19.4% graduate degree; 23.5% high school degree; 9.2% trade or technical degree; 17.3% less than high school degree). Mothers reported spending 47.13 ($SD = 21.26$) hours per week in the caregiving role, while fathers reported spending 34.33 ($SD = 21.41$) hours per week in the caregiving role.

Procedure

Participants were recruited through e-mails sent to a university participant database and online parenting groups, as well as flyers placed in public venues (e.g., recreational centers, churches, and daycare providers) throughout a moderately sized Midwest suburban city. To be eligible for the study, families needed to be characterized as having a mother, father, and an 8- to 12-year-old child. Furthermore, parents and children were required to live in the same household for at least the past two years. Eligible parents were e-mailed a link and password to an online website containing study questionnaires and parents were asked ensure that each family member completed study materials independently. The efficacy of data gathered using online methods is highly comparable to when utilizing traditional offline questionnaires (e.g., Riva et al. 2003). Families were compensated with a total of \$40 upon completion of the study.

Measures

Parental affect

Maternal and paternal negative and positive affect were measured via the positive and negative affect schedule (PANAS; Watson et al. 1988). The PANAS is characterized by participants indicating how often they experience one word emotions or feelings (e.g., scared) on a 5-point scale. Ten emotions/feelings comprise each scale, which are summed to form an overall score. Participants were asked to indicate the extent to which they felt each emotion during the prior 2 weeks in order to remain consistent with other measures utilized in the present study. The PANAS is a

widely utilized measure of negative and positive affect and excellent reliability and validity have been identified (Watson et al. 1988). Internal consistency for the negative ($\alpha = .92$ for mothers and $\alpha = .90$ for fathers) and positive ($\alpha = .91$ for mothers and $\alpha = .90$ for fathers) affect scales was excellent in this study.

Parenting behavior

The parent behavior inventory (PBI; (Lovejoy et al. 1999) was utilized to measure harsh/negative and supportive/positive maternal and paternal parenting behavior. On the PBI, parents are asked to indicate the extent to which they engage in parenting behaviors in general (e.g., “I complain about my child’s behavior”) using a 6-point scale. Ten items assess each dimension of parenting behavior, which are summed to form an overall score. In prior studies, adequate reliability and validity using the PBI has been demonstrated (Lovejoy et al. 1999; Murdock et al. 2014; Weis and Toolis 2010). In the current study, internal consistency for the harsh/negative ($\alpha = .74$ for mothers and $\alpha = .88$ for fathers) and supportive/positive ($\alpha = .90$ for mothers and $\alpha = .92$ for fathers) scales was adequate.

Child depressive symptoms

Child self-report of depressive symptoms was measured using the Children’s Depression Inventory-Second Edition (CDI2; Kovacs 2011). The CDI2 is a commonly utilized measure of depressive symptoms in children aged 7 to 17 years. For each of the 28 items on the CDI2, children are asked to select one feeling or idea within a group of three that best describes them during the previous 2 weeks (e.g., feeling sad once in a while, many times, or all the time). The feelings or ideas for each item are assigned a score ranging from 0 (none) to 2 (definite) and are summed to form an overall score. Adequate reliability and validity has been identified for the CDI2 (Kovacs 2011), which was corroborated the internal consistency identified in the current study ($\alpha = .89$). Notably, this sample was not a clinical sample with only 7% ($n = 7$) of children meeting criteria for the clinical cutoff for depressive symptoms in the CDI2 (i.e., a raw score of 20+).

Demographics

Parents provided self-reported ethnicity, marital status, total family income, and education via questionnaire format. Specifically, parents selected one of the following ethnicities: African-American, Caucasian, Asian, Hispanic, other. Marital status was either cohabitating or married given inclusion criteria. Total family income was an open ended question. Maternal and paternal reports of total

family income were averaged to form an overall indicator. Parents also selected their highest level of education from the following choices: less than high school degree, high school diploma/GED, some college, college degree, graduate degree, and trade or technical school.

Data Analyses

Descriptive statistics, bivariate correlations, t-tests, and ANOVAs were examined using SPSS software, version 21 (IBM 2012). EQS structural equation modeling software version 6.1 (Bentler 2005) was utilized in all primary analyses. Specifically, hybrid actor-partner interdependence models (APIMs) were analyzed. The hybrid models evaluated in the present study are the combination of traditional APIMs (Kenny et al. 2006) and the common fate model (Ledermann and Kenny 2012) that have been utilized in prior work (Conger et al. 1999). In such models, independent variables are correlated with each other, along with error terms for dependent variables that represent the same construct. Furthermore, all possible pathways are evaluated resulting in a fully saturated model, and therefore, fit indices are perfect. However, one can evaluate differences in the strength of effects by constraining congruent paths to be equal, which generates one degree of freedom, allowing one to compare whether or not the fit of the model was significantly reduced by an unequal strength in paths (Kenny et al. 2006).

Separate models were run examining how parental negative affect and harsh/negative parenting, and parental positive affect and supportive/positive parenting, were associated with child depressive symptoms. Theoretical (Dix 1991) and empirical (Rueger et al. 2011) evidence indicating that negative affect is more strongly associated with harsh/negative parenting behavior whereas positive affect is more strongly associated with supportive/positive parenting behavior provides support for running separate analyses; however, associations between maternal and paternal positive affect and harsh/negative parenting, as well as maternal and paternal negative affect and supportive/positive parenting, were also evaluated to rule out alternative pathways. Indirect effects were examined using 5000 bias-corrected bootstrap samples, which generates a 95% confidence interval for the indirect effect. This method has been determined to generate accurate indicators of indirect effects (MacKinnon et al. 2004).

Results

Descriptive statistics are presented in Table 1 and bivariate correlations between primary study variables are presented in Table 2. Maternal and paternal education and total family

income, as well as child age, were not significantly associated with primary study variables in bivariate correlation analyses. Furthermore, using repeated measures ANOVAs, study variables did not differ by child gender, parent marital status (cohabitating or married), or maternal or paternal ethnicity (Caucasian or other). Mothers reported engaging in significantly higher supportive/positive behavior than fathers ($t = 5.03, p < .001$). Bivariate correlations revealed that maternal negative affect was positively associated with paternal negative affect ($r = .24$). Similarly, maternal positive affect was positively associated with paternal positive affect ($r = .28$). Maternal harsh/negative behavior was positively associated with paternal harsh/negative behavior ($r = .42$). Maternal and paternal supportive/positive behavior were not significantly associated ($r = .07$).

When evaluating study hypotheses for parental negative affect and harsh/negative parenting (see Fig. 1), maternal

and paternal negative affect were significantly positively associated. Moreover, maternal negative affect was positively associated with maternal and paternal harsh/negative parenting behavior as predicted. In line with expectations, paternal negative affect was positively associated greater paternal harsh/negative parenting behavior. Higher maternal negative affect was directly related to greater child depressive symptoms, while a non-significant association between paternal negative affect and child depressive symptoms was identified. A significant reduction in model fit was identified when constraining the effect between maternal negative affect and child depressive symptoms and the effect between paternal negative affect and child depressive symptoms to be equal ($\chi^2(1) = 7.74, p < .05$; see Kenny et al. 2006). The observed reduction in model fit suggests that maternal negative affect was more strongly related to child depressive symptoms than paternal negative affect. All other congruent pathways did not significantly differ from each other. Further, more paternal, but not maternal, harsh/negative parenting behavior was associated with greater child depressive symptoms. Using bootstrap estimates (5000 samples; (Mallinckrodt et al. 2006), results indicated that paternal negative affect was indirectly associated with child depressive symptoms through paternal harsh/negative parenting behavior ($\beta = .06, 95\% \text{ CI} = .01, .19$). All other possible indirect effect when examining parental negative affect and harsh/negative parenting behavior in predicting child depressive symptoms were non-significant. The pattern of findings remained when adding child age, child gender, parental marital status, maternal and paternal age, and maternal and paternal education as covariates in ancillary analyses.

Associations between parental positive affect, supportive/positive parenting behavior, and child depressive symptoms were also evaluated (see Fig. 2). Maternal and paternal positive affect were significantly positively associated. Maternal positive affect was significantly positively

Table 1 Descriptive statistics for study variables

Variable	M	SD	Range
Maternal negative affect ^a	18.90	7.57	10–44
Paternal negative affect ^a	19.39	7.45	10–44
Maternal positive affect ^a	37.15	7.44	17–50
Paternal positive affect ^a	35.88	7.81	11–50
Maternal H/N ^b	14.63	7.05	5–37
Paternal H/N ^b	15.88	9.09	5–49
Maternal S/P ^b	48.22	7.16	20–55
Paternal S/P ^b	42.41	9.86	11–55
Child depressive symptoms ^c	8.56	6.87	2–41

Raw scores are reported. H/N = harsh/negative parenting; S/P = supportive/positive parenting

^a Measured using the positive and negative affect scale (Watson et al. 1988)

^b Measured using the parent behavior inventory (Lovejoy et al. 1999)

^c Measured using the Children’s Depression Inventory-Second Edition (Kovacs 2011)

Table 2 Bivariate correlations between study variables

Variable	1	2	3	4	5	6	7	8	9
1. Maternal negative affect	–								
2. Paternal negative affect	.24*	–							
3. Maternal positive affect	–.25*	–.18	–						
4. Paternal positive affect	–.12	–.23*	.28*	–					
5. Maternal H/N	.44*	.24*	–.26*	–.07	–				
6. Paternal H/N	.30*	.33*	–.06	–.24*	.42*	–			
7. Maternal S/P	–.30*	–.23*	.40	.14	–.46*	–.25*	–		
8. Paternal S/P	–.19	–.23*	.16	.49*	–.13	–.31*	.07	–	
9. Child depressive symptoms	.39*	.08	–.05	–.25*	.23*	.31*	–.21	–.19	–

H/N harsh/negative parenting, S/P supportive/positive parenting

* $p < .05$

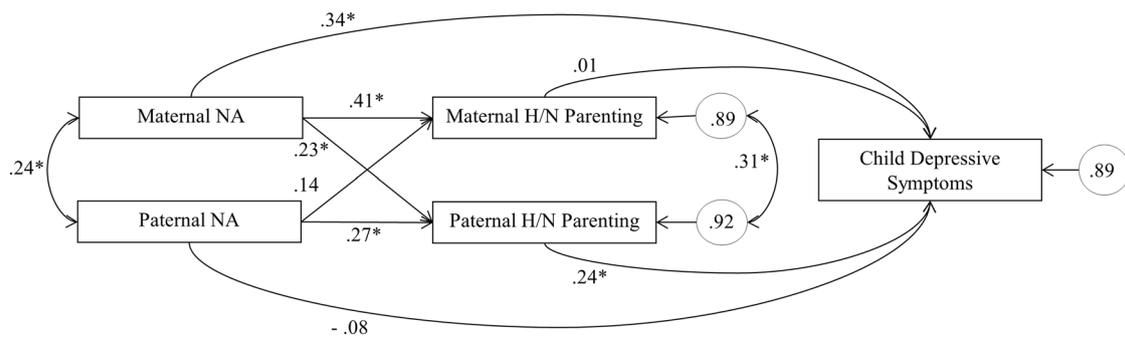


Fig. 1 Associations between parental negative affect, harsh/negative parenting behavior, and child depression. Values represent standardized coefficients. NA = negative affect. H/N = harsh/negative. * $p < .05$

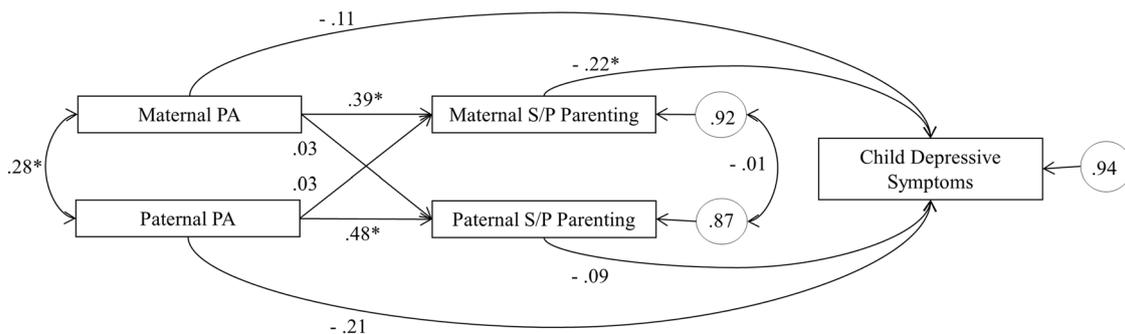


Fig. 2 Associations between parental positive affect, supportive/positive parenting behavior, and child depression. Values represent standardized coefficients. PA = positive affect. S/P = supportive/positive. * $p < .05$

associated with maternal, but not paternal, supportive/positive parenting behavior. Similarly, paternal positive affect was significantly positively associated with paternal, but not maternal, supportive/positive parenting behavior. Maternal supportive/positive parenting behavior was more strongly associated with maternal positive affect as compared to paternal positive affect given a significant reduction in model fit when constraining the paths to be equal ($\chi^2(1) = 5.90, p < .05$). Similarly, paternal supportive/positive parenting behavior was more strongly associated with paternal positive affect, as compared to maternal positive affect, as a significant reduction in model fit was identified when constraining the paths to be equal ($\chi^2(1) = 9.16, p < .05$). Moreover, maternal, but not paternal, supportive/positive parenting behavior was significantly negatively associated with child depressive symptoms, although the strength of effects did not significantly differ. Maternal positive affect was indirectly associated with child depressive symptoms through maternal supportive/positive parenting behavior ($\beta = -.09, 95\% \text{ CI} = -.22, -.01$). All other possible indirect effects represented in Fig. 2 were non-significant. Findings remained when including child age, child gender, parental marital status, maternal and paternal age, and maternal and paternal education as covariates in ancillary analyses.

Follow-up analyses were conducted to rule out alternative explanations for primary findings. Specifically, the association between parental positive affect and child depressive symptoms through parental harsh/negative behavior was evaluated. Consistent with bivariate correlations (see Table 2), maternal positive affect was significantly associated with maternal harsh/negative behavior ($\beta = -.26, p < .05$) and paternal positive affect was significantly associated with paternal harsh/negative behavior ($\beta = -.24, p < .05$); however, all partner effects and indirect paths were non-significant. Additionally, the association between parental negative affect and child depressive symptoms through parental supportive/positive behavior was analyzed. Maternal negative affect was significantly associated with maternal supportive/positive behavior ($\beta = -.26, p < .05$); however, all other actor, partner, and indirect effects were non-significant.

A full model, in which all primary study variables were included, was also analyzed. All significant associations and indirect effects identified in the models represented in Figs. 1 and 2 remained. The association between maternal negative affect and supportive/positive parenting behavior was no longer significant ($\beta = -.19, p > .05$). Likewise, the association between maternal positive affect and harsh/negative parenting behavior ($\beta = -.15, p > .05$), as well as

the association between paternal positive affect and paternal harsh/negative parenting behavior ($\beta = -.18, p > .05$), were no longer significant. Therefore, the models represented in Figs. 1 and 2 represent the data well and provide optimal efficiency for interpretation.

Discussion

Results indicated that paternal negative affect was indirectly associated with child depressive symptoms through paternal harsh/negative behavior; however, maternal negative affect was not significantly associated with child depression through maternal harsh/negative behavior, which is inconsistent with prior findings in which only mothers were included (Bifulco et al. 2002). This may be due the importance of paternal harsh/negative behavior not being modeled in the prior study, which is clearly important given present study data. The inconsistency in findings may also be due to differences in the type of harsh/negative parenting behavior being assessed. Indeed, Bifulco et al. (2002) examined parental antipathy, control, physical abuse, and sexual abuse whereas the present study utilized a measure with what could be argued as addressing a milder form of harsh/negative parenting behavior (e.g., “I complain about my child’s behavior”). Findings also add to the literature by demonstrating that maternal positive affect was indirectly associated with child depressive symptoms via maternal supportive/positive parenting behavior. Maternal positive affect and supportive/positive behavior have largely been examined as they relate to externalizing problems in children in previous research, with similar results (Karazsia and Wildman 2009). Therefore, maternal positive affect and supportive/positive behavior are important for predicting both internalizing and externalizing problems in children. Future work would benefit from examining maternal supportive/positive behavior as a mediator of the association between maternal positive affect and child externalizing problems when paternal positive affect and supportive/positive behavior are also included in the analyses to extend present study data.

Findings also extend the literature by demonstrating the importance of paternal characteristics in the prediction of depressive symptoms in children above and beyond maternal characteristics. This suggests that prior work may have missed an important third variable that may be related to previously identified associations between maternal harsh/negative behavior and child depressive symptoms. Present study findings also add to the emerging literature by demonstrating that maternal and paternal affect and parenting behavior are associated with child depressive symptoms via differing mechanisms (Lim et al. 2011). Specifically, supportive/positive behavior may be most

important in predicting child depressive symptoms among mothers, whereas harsh/negative behavior may be most important among fathers’ however, it is important to note that maternal negative affect was also directly associated with child depressive symptoms. It will be important to determine how such mechanisms may relate to everyday parent-child interaction in future work. For example, a mother experiencing high positive affect may have the necessary energy and motivation to engage in parenting behaviors (e.g., showing affection, providing positive feedback, etc.) that may reduce child depressive symptoms. Alternatively, father’s experiencing high negative affect may be more likely to engage in behaviors (e.g., yelling, physical abuse, etc.) that may increase child depressive symptoms than fathers experiencing less negative affect.

Gender roles may be important for understanding the differing associations between affect and parenting behavior among mothers and fathers, as discussed in prior work (e.g., Craig 2006; Murdock 2013). In particular, mothers may be more likely to match the negative emotions of others in the family (Slatcher et al. 2010), which is especially important given that mothers are more likely to spend time in the caregiving role than fathers (Craig 2006). This may explain why maternal negative affect was directly associated with child depressive symptoms whereas paternal negative affect was not. Although such an interpretation of prior work and current study results may be plausible, further research is clearly needed to generate a better understanding of why maternal and paternal negative affect are differentially associated with child depressive symptoms.

Present study findings also provide further evidence for the importance of simultaneously modeling maternal and paternal characteristics when predicting child outcomes, consistent with family systems theory (Minuchin 1985). Findings indicated that higher maternal negative affect was associated with greater paternal harsh/negative behavior. Furthermore, previous work indicated that maladaptive maternal behavior was important for understanding the association between maternal distress and child outcomes (Goodman and Gotlib 1999; Karazsia and Wildman 2009). When examining maternal and paternal characteristics together in the present study, maternal harsh/negative behavior was not significantly associated with child depressive symptoms. Rather, maternal negative affect and paternal harsh/negative behavior were significant predictors of child depressive symptoms. Findings in prior studies may have differed given the lack of inclusion of paternal harsh/negative that was predictive of child depressive symptoms in the present study.

In the full model, paternal positive affect and supportive/positive behavior were not significantly associated with child depressive symptoms as hypothesized. Using zero-order correlations, higher paternal positive affect was

associated with fewer child depressive symptoms. Prior work has indicated that reciprocal positive affect between fathers and children is important for predicting child affective problems (Thomassin and Suveg 2014), which was not captured using present study methodology. Paternal positive affect was also an important correlate of child externalizing problems in previous work (Murdock 2013), indicating that paternal positive affect may be more strongly related to child externalizing problems, which were not evaluated in the present study.

Limitations

The present study is limited due to the largely Caucasian sample and focus on heterosexual two parent households. Coparenting (i.e., the extent to which parents support each other's parenting; McHale and Lindahl 2011) was not evaluated in the present study, and will be important to incorporate into future research. Furthermore, the contribution of child depressive symptoms to parental affect and parenting behavior was not evaluated in the current study. There is some evidence to suggest that there are bidirectional associations between parent and child characteristics (Lewis et al. 2014). Therefore, longitudinal research designs are needed to rule out alternative explanations for present study findings. Longitudinal designs are also important for reducing potential bias in cross-sectional mediation models (e.g., Maxwell and Cole 2007). Depressive symptoms were also relatively mild in the present study sample, limiting the ability to generalize results to more severely depressed children. Moreover, parents reported engaging in a high amount of supportive/positive behaviors and relatively few harsh/negative behaviors; however, such levels are consistent with findings from other community samples (Lovejoy et al. 1999). The cross-sectional research design and measurement of self-reported parent and child characteristics are also limitations of this study given that parents and children may provide differing reports of child depression. Parents were asked to allow their children to complete the measure of depressive symptoms independently; however, due to the design of the study, there was not a mechanism to ensure children completed the measure of depressive symptoms without the influence of their parents. Observations of family interactions may provide a better understanding of associations between parent affect, parenting behavior, and child outcomes on a moment to moment basis; however, measurement of parental affect in "real time" during actual life events is difficult and has been rarely accomplished (Teti and Cole 2011). Importantly, self-reported parenting behavior using the PBI is associated with independent observer rating of parenting behavior (Lovejoy et al. 1999), indicating that such ratings are not driven purely by cognitive biases.

In conclusion, the present study extended the literature by demonstrating that maternal and paternal characteristics are differentially associated with child depressive symptoms. Indeed, maternal negative affect was directly associated with child depressive symptoms whereas paternal negative affect was indirectly associated with child depressive symptom via harsh/negative paternal behavior. Moreover, maternal positive affect was indirectly associated with child depressive symptoms via supportive/positive maternal behavior. These findings provide further support for the importance of investigating maternal and paternal characteristics within families, if applicable.

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Author Contributions K. M. designed and executed the study, completed the data analyses, and wrote the manuscript. L. P. supervised the design and execution of the study and provided critical feedback on the manuscript. C. P. supervised the data analyses and provided critical feedback on the manuscript.

Compliance with Ethical Standards

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

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval was obtained from the Northern Illinois University Institutional Review Board.

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