

Internalizing and Externalizing Symptoms in Sons and Daughters of Mothers with a History of Depression

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Abstract The purpose of the present study was to examine the independent and joint effects of child gender and informant (mother-report vs. child self-report) on children's internalizing and externalizing symptoms in an at-risk sample of children of mothers with a history of depression. Data were obtained from mothers with a history of major depressive disorder ($N = 149$) and their 9- to 15-year-old children (74 males, 75 females) to assess children's internalizing and externalizing symptoms. Little evidence was found that maternal depression amplified the typical gender differences in the prevalence of depressive symptoms and behavioral problems. Partial support was found for the hypothesis that maternal depression may equalize the rates of symptoms in boys and girls. There was also some evidence that maternal depression may reverse typical patterns of gender differences in depressive symptoms; i.e., using normative T scores to account for expected rates of problems, boys reported more symptoms than girls. Mothers and children reported significantly different levels of problems depending on child gender. Future research should investigate the processes of risk that may lead to changes in the normative patterns of gender differences in the context of maternal depression.

Keywords Child gender · Maternal depression · Internalizing symptoms · Externalizing symptoms · Informant

Introduction

Extensive research has shown that children of depressed parents are at elevated risk for developing both internalizing and externalizing symptoms and disorders, as rates of problems in these children exceed base rates reported in the normative population (England and Sim 2009; Weissman et al. 1997). Research has also shown consistent gender differences in the prevalence of internalizing and externalizing problems in the general population, with females at heightened risk for internalizing symptoms and males for externalizing symptoms, although in some instances effect sizes are small in magnitude (e.g., Rescorla et al. 2007a, b; see Zahn-Waxler et al. 2008, for a review). Normative gender differences in rates of internalizing and externalizing problems may be even more pronounced in children of depressed parents; i.e., girls may be at even greater risk for internalizing problems and boys for externalizing problems as a consequence of exposure to parental depression.

In spite of the potential importance of the level of risk associated with both child gender and parental depression, in a review of the literature on gender-specific risk to maternal depression Sheeber et al. (2002) noted that only a small number of studies with clinical samples of depressed parents have examined children's emotional or behavioral problems separately by child gender. However, given the differential vulnerability to emotional and behavioral problems during adolescence in males and females as well as the heightened vulnerability faced by children of

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depressed parents, the combination of these two sources of risk is important to consider. Sheeber et al. suggested that further research utilizing clinical samples of depressed parents is needed to examine children's emotional and behavioral problems as a function of gender as a next step in better understanding the potential moderating role of child gender on adjustment and to inform future interventions and treatment.

Internalizing and externalizing problems during adolescence may be related to child gender and parental depression in one of at least three ways. First, parental depressive history may *maintain* the typical gender differences, sustaining girls' heightened risk for internalizing problems and boys' risk for externalizing problems. Second, parental depressive history may *amplify* gender differences such that girls' risk for internalizing problems and boys' risk for externalizing problems exceed the risk reported in the general population. Lastly, parental depressive history may *equalize* the risk such that boys and girls are equally likely to develop internalizing and externalizing problems.

Results of previous studies of clinically depressed parents that have presented emotional and behavioral problems separately by child gender have been mixed, although there appears to be some evidence for an equalizing effect (e.g., Foster et al. 2008; Hammen and Brennan 2001; Orvaschel et al. 1988; Pawlby et al. 2009; Weissman et al. 2006). For example, Foster et al. found that in a sample of 151 currently depressed mothers and their children (ages 7- to 17-years-old), mothers reported no significant child gender differences on either the Internalizing or Externalizing Problems *T* score scales of the Child Behavior Checklist (CBCL; Achenbach and Rescorla 2001). Hammen and Brennan examined gender differences in rates of depression in a community sample of mothers and children (age 15 years) in which the mother either had a history of depression or no history of depression, and reported a non-significant trend for sons of mothers with a history of depression to be more likely to experience an episode of depression than sons of never depressed mothers, whereas daughters' risk was unaffected by maternal depression status. In contrast, Weissman et al. (2006) examined cumulative risk for a diagnosis of depression in offspring of depressed parents over a 20-year follow-up period, and reported that daughters of depressed parents had higher rates of depression than sons during adolescence, although their findings suggest that this gender difference dissipated as these children entered early adulthood.

There are several methodological issues that may account for the inconsistent findings in the literature. First, the heterogeneity of samples with respect to children's age may have complicated the findings. Although levels of internalizing symptoms, including symptoms of depression, in

females do not begin to exceed symptom levels in males until early to mid-adolescence, studies have examined gender differences in the context of parental depression in children as young as toddlers (e.g., Carter et al. 2001; Essex et al. 2003). Second, studies have differed in the way that children's internalizing and externalizing problems were quantified (i.e., raw symptom scores vs. normative *T* scores). Raw scores address the absolute level of symptoms whereas *T* scores that are standardized separately by gender take into account the base rates of gender differences that are found in the population (Achenbach and Rescorla 2001). Third, studies have varied in who is reporting the child's emotional and behavioral problems (i.e., parents, children, teachers). Given that research has found informant discrepancies in children's and adolescents' emotional and behavioral problems, the degree to which there are gender differences in internalizing and externalizing symptoms may depend on who is providing the information (Achenbach 2006, 2011; Achenbach et al. 1987).

Characteristics of the parent samples in previous studies also have not been consistent, as some have targeted parents with a history of depression (e.g., Hammen and Brennan 2001), while other studies have recruited community samples of parents with varying levels of symptoms of depression (e.g., Davies and Windle 1997). Further, several studies have constrained their sample to only intact families (e.g., Crawford et al. 2001; Jacob and Johnson 1997); given that marital conflict and divorce are associated with children's emotional and behavioral problems and may be heightened in families of depressed parents, samples of intact families may not be representative of the population (Afifi et al. 2009). Parent gender is another important variable to consider, as there is some evidence for an interaction between child gender and parent gender in predicting offspring's depressive problems (e.g., Eberhart et al. 2006; Landman-Peeters et al. 2008; Nomura et al. 2001). Therefore it is important to either include sufficiently large samples of both depressed mothers and fathers or to focus on only one parent gender.

The aim of the present study is to build upon previous research by examining internalizing and externalizing symptoms in children of mothers with a history of depression as a function of child gender, raw vs. normative *T* symptom scores, and mother- vs. child-reports. Given the discrepant findings in the literature to date, the following research questions were posed in an at-risk sample of children of mothers with a history of depression: (1) Is there a gender difference in the raw number of depressive and internalizing symptoms, and using *T* scores to account for expected rates of problems in the general population, is there a gender difference in depressive and internalizing symptoms? (2) Is there a gender difference in the raw number of behavioral problems and externalizing

symptoms, and using normative T scores to account for expected rates of problems, is there a gender difference in oppositional defiant problems and externalizing symptoms in this at-risk sample? (3) Do children's depressive symptoms and behavioral problems vary as a function of informant and child gender or the interaction of these two factors?

Method

Participants

The sample included 180 families with 242 children (121 boys, 121 girls) between the ages of 9 and 15 years ($M = 11.53$, $SD = 2.02$). The target parents (160 mothers, 20 fathers) all met criteria for at least one episode of major depressive disorder during the lifetime of their children ($Mdn = 4.0$). Based on previous empirical findings that children's adjustment problems may vary by the gender of the target parent and child (e.g., Nomura et al. 2001), and because the sample size of fathers was too small to conduct the analyses separately by the gender of the parent, only mothers were included in the analyses. Additionally, a number of families had more than one child participating in the study. In consideration of the possible violation of independence of children within the same family, one child per family was randomly selected from each family for all analyses. Finally, families that did not have complete data from both the mother and the child were excluded from the analyses ($n = 11$), resulting in 149 children being selected and 93 children being omitted from the analyses.

The final sample included 74 boys and 75 girls between the ages of 9 and 15 ($M = 11.41$, $SD = 2.02$) and their mothers ($N = 149$) who met criteria for at least one episode of major depressive disorder ($Mdn = 4.0$) during their child's lifetime. This age range is suitable for investigating gender differences in depressive problems and behavioral disturbances given that these problems increase in early to mid-adolescence (e.g., Hankin et al. 1998; Rescorla et al. 2007a, b). The sample of children were 74.5% Euro-American, 12.8% African-American, 2.0% Asian, 2.0% Latino or Hispanic, .7% American Indian or Alaska Native, and 8.1% mixed ethnicity. Mothers ranged from 24 to 57 years of age ($M = 41.22$, $SD = 7.20$). Mothers' level of education included 6.0% less than high school, 8.7% completed high school, 29.5% had some college or technical school, 33.6% had a college degree, and 22.1% had a graduate education. The marital statuses of the mothers were 59.7% married or co-habiting, 22.8% divorced or annulled, 10.7% never married, 5.4% separated, and 1.3% widowed. Annual household income ranged from less than \$5,000 to more than \$180,000, with a median household

Table 1 Family demographic variables of male and female children

Demographic	Males ($n = 74$)	Females ($n = 75$)
Age M		
Child	11.35	11.47
Mother	41.55	40.89
Child race/ethnicity* (%)		
Caucasian	86.5%	62.7%
African American	6.8%	18.7%
Asian	0%	4.0%
Latino or Hispanic	0%	4.0%
American Indian or Alaska Native	0%	1.3%
Mixed ethnicity	6.8%	9.3%
Maternal marital status (%)		
Never married	6.8%	14.7%
Married or co-habiting	64.9%	54.7%
Divorced/annulled	20.3%	25.3%
Separated	8.1%	2.7%
Widowed	0%	2.7%
Family income (%)		
Less than \$25,000	20.3%	27.0%
\$25,000–\$59,000	40.6%	36.5%
\$60,000–\$89,000	26.1%	14.9%
Greater than \$90,000	13.0%	21.6%
Maternal education (%)		
Less than high school	5.4%	6.7%
High school or equivalent	9.5%	8.0%
Some college/technical school	25.7%	33.3%
College graduate	31.1%	36.0%
Graduate education	28.4%	16.0%

* $p < .05$

income of \$40,000. Table 1 presents the demographic variables separately by child gender. Independent samples t -tests for parent and child age as well as chi-square comparisons for the categorical demographic variables indicated that boys and girls significantly differed only on child race/ethnicity ($\chi^2 = 14.19$, $df = 5$, $p = .01$).

Procedure

Participants in the current study were part of a larger study testing the efficacy of a family group cognitive behavioral intervention to prevent depression and other mental health problems in children of parents with a history of major depressive disorder. All data used in the present study were collected at the baseline assessment before the family was randomized to either the family group intervention or the comparison condition. Families were recruited through a variety of sources including mental health clinics and local media outlets. After the family made initial contact with a

member of the research team, a trained research assistant conducted a telephone screen with the target parent to determine whether the family met all eligibility requirements for the study.

Inclusion criteria included at least one child in the targeted age range and a parent with at least one episode of major depressive disorder in the child's lifetime. Exclusion criteria for the target parent included a history of bipolar-I, schizophrenia, or schizoaffective disorder. Exclusion criteria for the child included a diagnosis of mental retardation, autism spectrum disorder, bipolar-I, schizophrenia, or conduct disorder, as these were all deemed to be inappropriate for the family group intervention. Additionally, if a target parent met criteria for a current diagnosis of major depressive disorder along with a Global Assessment of Function (GAF) score of 50 or less, was actively suicidal, had a history of drug or alcohol use disorders along with a GAF of 50 or less, or if the child met criteria for a current diagnosis of major depressive disorder, then the family was put on hold and re-contacted 3 months later for a follow-up assessment. At the re-assessment period, if the parent was no longer actively suicidal, their GAF score was above a 50, or if the child no longer met diagnostic criteria for MDD, the family was considered eligible to participate in the study. Children who were excluded for Conduct Disorder included 8 boys and 12 girls and children who were put on hold for a current diagnosis of MDD and were never re-assessed included 8 males and 11 females.

The University Institutional Review Boards at both sites approved all procedures. Families that met eligibility requirements from the initial telephone screen were invited into the lab for a baseline assessment during which both the target mother and child filled out a battery of questionnaires and completed a semi-structured interview with a trained research assistant to obtain a more comprehensive assessment of their current and past history of psychopathology.

Measures

Demographics

Demographic information was obtained from both child and mother report. Children reported their own age and gender, while mothers reported their own age, gender, marital status, education level, family annual household income, and their child's race/ethnicity.

Children's Emotional and Behavioral Problems

The Child Behavior Checklist (CBCL; Achenbach and Rescorla 2001) and the Youth Self-Report (YSR; Achenbach & Rescorla) were used to assess children's symptoms

of depression and behavioral problems. The CBCL is a 118-item parent report of their child's behaviors based on rating the accuracy of statements on a 3-point Likert scale (0 = *not at all true*; 1 = *somewhat true*; 2 = *very true*). The YSR is the self-report version of the CBCL completed by children and adolescents 11- to 18-years-old. The YSR and CBCL have been shown to have good reliability and validity (Achenbach & Rescorla). The raw scores represent the total number of symptoms endorsed on each scale and were used to directly compare boys and girls within the sample. The YSR and CBCL have been normalized based on age and gender with a national representative sample of children and adolescents to yield *T* scores and were used in all of the analyses to compare the children to a national representative sample of their same gender peers (Achenbach & Rescorla).

The Internalizing Problems and DSM Affective Problems scales were used as indicators of depressive symptoms and the Externalizing Problems and DSM Oppositional Defiant Disorder scales as indicators of behavioral disturbances. The Internalizing and Externalizing problem broadband scales provide global measures of child internal problems and problems with others, respectively, and were chosen because of consistent gender differences reported on these scales (e.g., Rescorla et al. 2007a, b). The DSM scales were developed to be consistent with diagnoses of Depression and Conduct disorder and are a more narrow measure of child depressive symptoms and behavioral problems than the broadband scales (Achenbach & Rescorla); these scales were chosen because gender differences in both disorders emerge in early to mid-adolescence (e.g., Loeber et al. 2000).

Internal consistency for the scales used in the current sample ranged from $\alpha = .63$ to $.90$ for the YSR and $\alpha = .74$ to $.90$ for the CBCL. In addition, because the YSR was administered to children under the standardized age of 11 years, we examined internal consistency on the YSR for the 9- to 10-year-olds in the sample and it was comparable to that for the older age group (all alphas $\geq .79$, with the exception of ODD $\alpha = .66$).

Data Analytic Approach

All analyses were conducted using PASW Statistics 18. First, given that male and female children significantly differed on their race/ethnicity, a series of independent samples *t*-tests were calculated to determine whether this demographic variable was significantly related to children's scores on the CBCL and YSR scales. Second, the means and standard deviations of the four CBCL and YSR raw and *T* score symptom scales were calculated separately for males and females. Third, two-way repeated measures ANCOVAs were used to examine main effects of child

Table 2 Means and standard deviations of symptoms by child gender and informant

Variable	Child report		Maternal report	
	Males M (SD)	Females M (SD)	Males M (SD)	Females M (SD)
Internalizing problems				
Raw score	14.11 (8.98)	14.17 (9.98)	10.69 (6.95)	12.44 (8.18)
T score	57.58 (11.07)	52.81 (11.49)	58.89 (10.32)	59.29 (10.77)
Affective problems				
Raw score	4.84 (4.13)	4.97 (4.20)	3.43 (2.94)	4.23 (3.36)
T score	57.91 (8.39)	55.80 (6.98)	59.22 (7.84)	60.80 (8.29)
Externalizing problems				
Raw score	10.68 (7.40)	8.99 (6.46)	9.12 (6.78)	10.69 (9.57)
T score	51.05 (10.70)	48.85 (9.74)	53.54 (9.86)	55.44 (11.84)
Oppositional defiant problems				
Raw score	3.22 (2.10)	2.83 (1.97)	3.31 (2.36)	3.33 (2.60)
T score	55.68 (6.20)	53.80 (5.81)	57.19 (7.21)	57.79 (7.99)

M mean, SD standard deviation

gender, informant, and an interaction of child gender and informant controlling for child race/ethnicity on children’s depressive symptoms and behavioral problems. Finally, a series of ANCOVAs were conducted to calculate the simple effects of child gender differences in depressive symptoms and behavioral problems at each level of informant while controlling for child race/ethnicity. Both raw scores and T scores of the YSR and CBCL were used as dependent variables in all of the analyses.

With power set at $\beta = .80$ and $\alpha = .05$, and a total sample of 149, we were able to detect effects of $d = .23$ or larger in 2-group analyses and effects of $d = .27$ or larger in 4-group analyses.

Results

Preliminary Analyses

Child race/ethnicity was coded such that minority = 0 and non-minority = 1. Results from a series of independent samples t-tests indicated that there were significant differences on the symptom scales as a function of child race/ethnicity. Specifically, differences were found on both the raw symptom scores and T scores on all four scales of the YSR and CBCL (i.e., children in the minority group were significantly higher on all problem scales; p 's < .05, d 's ranged from .38–.79). Therefore, child race/ethnicity was entered as a covariate in all further analyses.

Descriptive Statistics

Table 2 presents the means and standard deviations of the raw scores and T scores on the Internalizing Problems,

Externalizing Problems, DSM Affective Problems, and DSM Oppositional Defiant Disorder Problems scales separately by child gender and informant (i.e., child and mother). Children and mothers, respectively, reported mean T scores of 55.18 and 59.09 on the Internalizing Problems scale, 56.85 and 60.01 on the DSM Affective Problems scale, 49.95 and 54.50 on the Externalizing Problems scale, and 54.73 and 57.49 on the DSM Oppositional Defiant Problems scale. The percentage of children and mothers reporting symptoms in the clinical range of functioning on the Internalizing Problems scale (24.8 and 40.3%, respectively) and Externalizing Problems scale (10.7 and 22.8%, respectively) indicate that this is an at-risk sample of children and adolescents, as only 10% are expected to exceed the cut-off ($T > 63$) based on normative data. Further, the percentage of children exceeding the clinical range cut-off ($T > 70$) on the DSM Affective Problems (5.4% YSR, 10.7% CBCL) and Oppositional Defiant Disorder (.7% YSR, 8.1%) scales ($T > 70$) is greater than found in the normative population sample (i.e., 2%) for three of four comparisons.

(1) Gender Differences in Raw Scores and T Scores of Depressive and Internalizing Symptoms

The two-way repeated measures ANCOVA analyses examining child depressive and internalizing symptoms while controlling for child race/ethnicity are presented in Table 3. The results indicate that there was a significant main effect of child gender on the Internalizing Problems T score scale ($p < .05$) with male children scoring higher than female children. Significant main effects were not found on the Internalizing Problems raw symptom score or the DSM Affective Problems raw score or T score scales.

Table 3 Two-way repeated measures ANCOVAs for depressive symptoms and behavioral problems

Effect	Raw score			T score		
	df	F	p	df	F	p
Affective problems						
Child race/ethnicity	1	3.54	ns	1	3.31	ns
Child gender	1	.39	ns	1	.28	ns
Informant	1	2.82	ns	1	9.35	<.01
Informant × child race/ethnicity	1	.54	ns	1	.01	ns
Informant × child gender	1	.28	ns	1	6.25	.01
Internalizing problems						
Child race/ethnicity	1	9.76	<.01	1	11.07	<.01
Child gender	1	.08	ns	1	3.99	.05
Informant	1	2.49	ns	1	9.37	<.01
Informant × child race/ethnicity	1	1.26	ns	1	.14	ns
Informant × child gender	1	1.66	ns	1	7.30	.01
Oppositional defiant problems						
Child race/ethnicity	1	6.56	.01	1	5.20	.02
Child gender	1	1.01	ns	1	1.13	ns
Informant	1	.33	ns	1	5.37	.02
Informant × child race/ethnicity	1	.31	ns	1	.54	ns
Informant × child gender	1	.75	ns	1	2.93	ns
Externalizing problems						
Child race/ethnicity	1	11.42	<.01	1	12.35	<.01
Child gender	1	.34	ns	1	.43	ns
Informant	1	.40	ns	1	9.72	<.01
Informant × child race/ethnicity	1	.98	ns	1	.27	ns
Informant × child gender	1	5.55	.02	1	4.70	.03

(2) Gender Differences in Raw Scores and T Scores of Oppositional Defiant and Externalizing Problems

The two-way repeated measures ANCOVA analyses examining child oppositional defiant behavioral and externalizing problems while controlling for child race/ethnicity are presented in Table 3. The results indicate that there were no significant main effects of child gender on the Externalizing Problems raw score or T score scales or on the DSM Oppositional Defiant Disorder raw score or T score scales.

(3) Depressive and Behavioral Problems as a Function of Informant and Child Gender

The results of the ANCOVAs testing informant main effects (see Table 3) revealed significant effects on the Internalizing Problems T score ($p < .01$), DSM Affective

Problems T score ($p < .01$), Externalizing Problems T score ($p < .01$), and DSM Oppositional Defiant Problems T score ($p < .05$) scales, but no significant main effects of informant were found on the raw scores of these four scales. For all four significant T score effects, mothers reported higher levels of problem behaviors than children.

The results of the ANCOVAs testing interaction effects of informant by child gender presented in Table 3 indicate significant interaction effects on both the Internalizing Problems T score ($p < .01$) and DSM Affective Problems T score scales ($p < .05$), as well as on both the Externalizing Problems raw score and T score scales ($p < .05$). No significant interaction effects were found on the raw scores of the Internalizing Problems and DSM Affective Problems, or on the DSM Oppositional Defiant Problems raw score and T score scales.

A series of ANCOVAs were calculated, co-varying for child race/ethnicity, to examine the simple effects of child gender at each level of informant (i.e., child-report and mother-report) for the significant informant by child gender interactions reported in the two-way repeated measures ANCOVAs (see Table 4). The results of the simple effects analyses indicate that there was a significant gender difference on the child-reported YSR Internalizing Problems T score ($p < .01$) and non-significant trends for the YSR DSM Affective Problems T score ($p = .06$), Externalizing Problems raw score ($p = .06$), and Externalizing Problems T Score ($p = .08$) scales; no child gender differences were found on any of the mother-reported CBCL scales.

The child-reported differences noted in the preceding paragraph are evident by examining the descriptive statistics shown in Table 2. For the normative T scores of the YSR Internalizing Problems scale, which take into account the expected rates of problems in the general population for child gender, boys ($M = 57.78$) endorsed significantly more internalizing symptoms than girls ($M = 52.81$) relative to their same age and gendered peers, with an effect size that was small in magnitude ($d = .42$). Similarly, on the normative T scores of the YSR DSM Affective scale, the difference between boys ($M = 57.81$) and girls ($M = 55.80$) revealed a non-significant trend of males reporting a greater number of symptoms than females compared to their same age and gendered peers, with an effect size small in magnitude ($d = .27$). On the YSR Externalizing Problems raw score scale, males ($M = 10.68$) reported marginally greater symptoms than females in the sample ($M = 8.99$), with an effect size small in magnitude ($d = .24$). Similarly, on the Externalizing Problems T Score scale, males ($M = 51.05$) obtained a marginally higher score than females ($M = 48.85$), with an effect size that was small in magnitude ($d = .22$). A summary of the results is presented in Table 5.

Table 4 ANCOVAS: gender differences simple effects on YSR and CBCL symptoms

Effect	df	F	p
YSR internalizing problems <i>T</i> score			
Intercept	1	1624.26	<.01
Child race/ethnicity	1	8.34	<.01
Child gender	1	9.37	<.01
CBCL internalizing problems <i>T</i> score			
Intercept	1	2155.63	<.01
Child race/ethnicity	1	7.05	.01
Child gender	1	.03	.86
YSR affective problems <i>T</i> score			
Intercept	1	3784.41	<.001
Child race/ethnicity	1	2.55	.11
Child gender	1	3.62	.06
CBCL affective problems <i>T</i> score			
Intercept	1	3851.22	<.001
Child race/ethnicity	1	1.96	.16
Child gender	1	.94	.34
YSR externalizing problems raw score			
Intercept	1	106.86	<.01
Child race/ethnicity	1	6.68	<.01
Child gender	1	3.60	.06
CBCL externalizing problems raw score			
Intercept	1	66.03	<.01
Child race/ethnicity	1	9.88	<.01
Child gender	1	.47	.49
YSR externalizing problems <i>T</i> score			
Intercept	1	1617.72	<.01
Child race/ethnicity	1	7.70	<.01
Child gender	1	3.10	.08
CBCL externalizing problems <i>T</i> score			
Intercept	1	1703.09	<.01
Child race/ethnicity	1	10.00	<.01
Child gender	1	.35	.56

YSR Youth self-report, CBCL child behavior checklist

Discussion

The current study builds on previous research by examining possible effects of both child gender and informant in reports of depressive symptoms and internalizing and externalizing problems in an at-risk clinical sample of children of mothers with a history of depression. Specifically, we investigated whether there were child gender differences in *raw* symptom scores and *normative T* scores (i.e., taking into account normative gender differences in rates of problems) in broadband and narrow-band measures of children’s symptoms. Additionally, we examined whether child gender differences in symptoms varied as a

function of informant (i.e., mother-report vs. child-report). Findings from previous empirical studies in this population have been mixed, as some studies report no child gender differences in emotional and behavioral problems (e.g., Foster et al. 2008), while others have found one gender to be at heightened risk for maladjustment (e.g., Hammen and Brennan 2001; Pawlby et al. 2009). Although two of the strongest risk factors for developing internalizing and externalizing problems are gender (Rescorla et al. 2007a, b) and being a child of a depressed parent (England and Sim 2009), the relative contributions of these sources of risk on the development of symptoms remains unclear. Further, an understanding of the role of child gender on the development of adjustment problems in the context of maternal depression may help inform decisions about whether prevention and treatment programs should differentially target one gender identified as most at-risk or target both genders equally (Garber and Downs 2011; Sheeber et al. 2002).

Overall, findings from the current study suggest maternal depression may *equalize* gender-specific risk to internalizing and externalizing problems in children of mothers with a history of depression, and in some instances it may even *reverse* the typical pattern of gender differences in problem behaviors (i.e., taking into account normative data, boys had higher levels of internalizing problems *T* scores relative to girls). There was no evidence that maternal depression either *amplified* or *maintained* the typical gender differences in rates of internalizing and externalizing problems. In addition, findings suggest that it is important to consider how children’s adjustment problems are quantified (i.e., raw symptoms vs. *T* scores), as few child gender and informant differences emerged on raw symptoms relative to *T* scores on the four problem scales. Further, the current findings suggest that it is important to consider who is providing the information, as mothers reported significantly higher levels of norm-based child problems than sons and daughters, but in some instances gender differences were found for child-report, but no gender differences were found on mother-reported problems. These findings suggest that mothers with a history of depression could be over-reporting problem behaviors and at the same time may be relatively less sensitive to gender differences in depressive symptoms and behavioral problems in their children. Consistent with these findings, Gartstein et al. (2009) recently reported that depressed parents may be biased in ratings of their children’s emotional and behavioral problems. Our findings suggest that child gender main effect differences may be hidden by the informant discrepancies.

In analyses examining child gender main effects on emotional and behavioral problems, no significant differences were found on the *raw* symptom scores of any of the four problem scales. However, a significant child gender

Table 5 Summary table of two-way repeated measures ANCOVAs

Variable	Gender main effect	Informant main effect	Child gender by informant interaction	Simple effect
Raw scores				
Internalizing problems	No	No	No	
Affective problems	No	No	No	
Externalizing problems	No	No	Yes*	YSR: males > females [†]
Oppositional defiant problems	No	No	No	
<i>T</i> scores				
Internalizing problems	Yes*	Yes**	Yes**	YSR: males > females**
Affective problems	No	Yes**	Yes*	YSR: males > females [†]
Externalizing problems	No	Yes**	Yes*	YSR: males > females [†]
Oppositional defiant problems	No	Yes*	No	

[†] $p \leq .10$; * $p \leq .05$;

** $p \leq .01$

main effect was found on the *T* scores of the Internalizing Problems scale, with boys scoring significantly higher than girls. This pattern suggests the *equalization* of internalizing and externalizing problems in sons and daughters in the context of maternal depression, as there were not main effects for child gender on 7 of the 8 comparisons. Further, the one scale just noted where a difference did emerge indicated a *reversal* of the typical pattern of girls displaying more internalizing problems than boys. It is also noteworthy that although few child gender main effects were found, we had the power to detect differences that were relatively small in magnitude (i.e., $d \geq .23$). These results are consistent with the findings from Foster et al. (2008) using a clinical sample of mothers, as no child gender differences were found on either the Internalizing or Externalizing Problems *T* score scales of the CBCL. Our findings extend those of Foster et al. as we also examined child-reported problems on the YSR.

With regard to the informant main effect differences (i.e., mother-report vs. child-report), there were no significant informant main effects on the *raw* symptom scores on any of the four depressive symptoms or behavioral problems scales. However, informant main effects were found on the normative *T* scores of all four scales. Specifically, we found higher *T* scores for mothers' reports on the CBCL as compared with adolescents' reports on the YSR for all 4 scales. These findings are important because they suggest discrepancies in reports of emotional and behavioral problems by mothers and children. That is, children endorsed having significantly fewer symptoms than were reported by their mothers. As noted previously, these findings are consistent previous studies that have found discrepancies on reports of child adjustment between depressed parents and their children (e.g., Gartstein et al. 2009).

In analyses of the child gender by informant interaction effects on the raw symptom scores, a significant effect was

found on the Externalizing Problems scale; there were no significant findings on the *raw* symptom scores of the DSM Affective Problems, Internalizing Problems, or the DSM Oppositional Defiant disorder scales. Further, examining child gender by informant effects on the *T* score scales, significant interaction effects were found on the DSM Affective Problems, the Internalizing Problems, and Externalizing Problems scales; no significant findings were reported on the *T* scores of the DSM Oppositional Defiant Disorder scale. To our knowledge, no previous studies have examined child gender differences in emotional and behavioral problems in the context of maternal depression as a function of informant (i.e., mother-report vs. child-report). However, these findings suggest that it is important to consider who is reporting on child adjustment.

The simple effects analyses for the significant child gender by informant interaction effects indicated that mothers did not report any child gender differences on any of the depressive symptom or behavioral problem scales. Conversely, boys endorsed significantly more symptoms than girls on the Internalizing Problems *T* score scale relative to their same gender peers, with an effect size small in magnitude ($d = .42$). A similar pattern of results was found on the DSM Affective Problems *T* score scale, with an effect size small in magnitude ($d = .27$), although the findings only approached significance ($p = .06$). Although significant child gender by informant interaction effects were found on the Externalizing Problems raw symptom and *T* score scales, the simple effects findings were non-significant on mother-reported problems and approached significance on child-report, with a non-significant trend for boys scoring higher than girls in level of behavioral problems, with effect sizes small in magnitude (p 's < .10; d 's = .22–.24). These findings indicate that any evidence for gender differences in children's emotional and behavioral disturbances emerged only when considering who was reporting the information. That is, mothers were not

sensitive to differences in problems between their sons and daughters, even though boys tended to endorse more problems than girls.

The present study had several limitations that should be noted. As noted above, we had to exclude children with a diagnosis of Conduct Disorder and those currently depressed, and so the sample may be biased due to these exclusions. Second, fathers were excluded from all analyses based on the small sample size in the present study, limiting our ability to examine interactive effects of parent and child gender. Lastly, because all of the analyses were cross-sectional, we could not examine the emergence of gender differences across time.

The present study had a number of notable strengths. First, consistent with the recommendation from Sheeber et al. (2002), we recruited a large clinical sample of mothers with a history of depression and their children. Further, this sample was more representative than some prior studies as it included mothers and children from both intact and non-intact families. Second, we collected data on both mother-report and child-report of children's depressive symptoms and behavioral problems. Third, this study used both raw symptoms and *T* scores to examine child gender differences to better understand how the sons and daughters in the present sample deviated from each other in the raw scores of their symptoms and how they deviated from the normative population, taking into account the expected rates of problems for their age and gender. Finally, to our knowledge, this is the first study to examine independent and joint effects of child gender and informant (mother-report and child-report) on children's depressive symptoms and behavioral problems in a sample of mothers with a history of MDD.

In summary, the current study found support for the equalization of rates of internalizing and externalizing problems in sons and daughters of mothers with a history of depression. Unexpectedly, there was also some evidence that maternal depression reversed the typical pattern; i.e., using normative *T* scores to account for expected rates of problems, boys were higher than girls on the YSR Internalizing Problems scale. Further, the findings suggest that it is important to consider whether child adjustment is reported as raw symptom scores or *T* scores, as these methods of scoring produced different patterns of child gender and informant differences. In addition, the study found evidence of informant discrepancies in reports of depressive and behavioral problems, with mothers not only reporting a greater number of depressive symptoms and behavioral problems relative to their children's reports, but also mothers did not report any significant child gender differences in rates of these problems. In future research, increased attention should be placed on examining the moderating role of child gender on the development and

treatment of emotional and behavioral problems in at-risk populations, and examining possible informant discrepancies that may be hiding significant differences between groups (e.g., gender differences, differences between experimental and control conditions). Further, research should also investigate the processes of risk that may lead to changes in the normative patterns of gender differences in depression in the context of maternal depression.

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