Intergenerational Transmission of Psychopathology

Minor Versus Major Parental Depression

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Abstract: This study used data from the National Comorbidity Survey to investigate associations between: (1) maternal and paternal depression and young adult offspring psychopathology, and (2) major and minor parental depression and offspring psychopathology. Offspring of a depressed parent were significantly more likely to experience a psychiatric disorder by young adulthood than offspring of nondepressed parents. Major and minor maternal and paternal depression were associated with comparable increases in risk for offspring 12-month mood, anxiety, and substance use disorders and lifetime substance use disorder. However, maternal major depression was associated with a greater risk for offspring lifetime mood and anxiety disorder than maternal minor depression. Risk for lifetime mood and anxiety disorder did not differ by severity of paternal depression. These findings suggest that parental depressive symptoms that do not meet major depressive disorder criteria may nevertheless have significant adverse associations with offspring mental health.

Key Words: Maternal depression, paternal depression, parental depression, major depression, minor depression, offspring psychopathology.

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Offspring of parents with histories of depression are at substantially increased risk for developing a psychiatric disorder themselves (Downey and Coyne, 1990; Gelfand and Teti, 1990). Parental depression has been found to be associated not only with offspring depression but also with higher rates of anxiety disorders, such as phobia and panic disorder, and substance use disorders, such as alcohol dependence (Lieb et al., 2002a; Weissman et al., 1997). Furthermore, parental depression is associated with a more impairing and protracted course of offspring disorder (Rohde et al., 2005). Relatively severe manifestations of depression among parents (i.e., major depressive disorder) are a well-established risk factor for offspring psychiatric disorder. However, the extent to which less severe forms of depression (i.e., minor depression) confer risk remains unclear.

Minor depression is defined as the presence of at least 2 but <5 depressive symptoms plus clinically significant distress and impairment for ≥ 2 weeks (American Psychiatric Association, 1994). It has received increased attention of late, as research indicates that individuals not meeting full criteria for major depression exhibit functional impairment (Backenstrass et al., 2006; Wagner et al., 2000), and that the economic costs and burden to society of minor depression approach those of major depression (Cuijpers et al., 2007). These findings are consistent with the spectrum hypothesis of depression, which suggests that depressive syndromes exist on a continuum of severity (Cuijpers et al., 2004; Kessler et al., 1997; Rapaport et al., 2002), in contrast to a conceptualization of major depression as categorically different from subthreshold depressive states (Solomon et al., 2001).

Research conducted by Keller et al. (1986) examining clinical characteristics of parental depression in relation to offspring impairment was the first to demonstrate that more severe parental depression was associated with poorer adaptive functioning and increased psychopathology in offspring. Several more recent studies have investigated the impact of severity of parental depression with mixed findings. Two studies have demonstrated an association between severity of parental depression and psychopathology in child and adolescent offspring (Grigoroiu-Serbanescu et al., 1991; Hammen and Brennan, 2003), whereas a study of the same relationship in adult offspring found no association (Peisah et al., 2005).

However, this literature is limited in several ways. First, no prior study has used the American Psychiatric Association (APA, 1994) criteria for minor depression. Second, the majority of investigations in this area have focused on maternal depression, with only a small number including paternal depression (Phares and Compas, 1992; Connell and Goodman, 2002). Several studies have reported that paternal depression increases risk for offspring disorder (Brennan et al., 2002; Kane and Garber, 2004; Klein et al., 2005), however, suggesting that fathers with depression should be included in this work. Finally, prior studies have relied upon clinical or community samples; the associations between severity of parental depression and offspring psychopathology have not yet been examined with data from a United States nationally representative sample.

This study assessed the extent to which major and minor parental depression are associated with psychopathology among young adult offspring. Nationally representative data on 1255 young adult participants in the National Comorbidity Study (NCS) were analyzed. Parental depression was defined so as to include both maternal and paternal depression. Minor depression was defined according to standard criteria (APA, 1994). The probability of mood, anxiety, and substance use disorders among offspring were evaluated. We tested 2 hypotheses: (1) We predicted that having a parent with major depression or a parent with minor depression would each independently be associated with a higher probability of 12-month and lifetime mood, anxiety, or substance use disorder among offspring when compared with having nondepressed parents. (2) We predicted that the probability of 12-month and lifetime psychiatric disorder among offspring would not be significantly greater for those whose parents had major depression, as opposed to minor depression. These hypotheses were tested separately for maternal and paternal depression.

METHODS

Participants

Data for these analyses were drawn from the NCS, a 2-part epidemiologic study designed to estimate the prevalence of psychiatric disorders in a nationally representative sample (Kessler et al., 1994). In part 1, trained interviewers administered standardized questionnaires to a total of 8098 individuals aged 15 to 54 years in

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the civilian population between September 1990 and February 1992. In part 2, participants aged 15 to 24, those who reported having one or more lifetime psychiatric disorders, and a 1 in 6 random subsample of all remaining participants were administered a second, more extensive interview, which included questions on self and parental psychopathology ($N = 5877$). A more detailed description of the NCS study methodology is presented elsewhere (Kessler et al., 1994).

Sample selection for this analysis was based on a 3-step process. First, the sample was restricted to young adult participants aged 18 to 29 who completed the second part of the interview ($n = 1752$). This age group was selected to ensure that participants had passed through or entered the period of highest risk for onset of each of the selected disorders (Kessler et al., 2005) and so as not to confuse different developmental periods. Second, young adult participants who reported history of parental substance use disorder ($n = 408$) were removed from the sample. Of the remaining 1344 participants, 210 reported a history of maternal depression, 96 reported a history of paternal depression, and 89 reported a history of depression among both parents. Because the focus of the current research is on the distinction between major depression and minor depression, the 89 participants with 2 affected parents were removed from the sample because of the complexity of teasing apart the effect of major versus minor depression when both parents are depressed. Thus, based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 1994) criteria for major depression and provisional criteria for minor depression, participants were categorized according to their parents history of psychopathology as follows: (1) those with parental history of minor depression in 1 parent only and no parental history of a substance use disorder ($n = 116$), (2) those with parental history of major depression in 1 parent only and no parental history of a substance use disorder ($n = 190$), and (3) those with no parental history of depression or substance use disorder ($n = 949$). Participants who reported parental history of anxiety disorder were not removed from the sample because of the highly comorbid nature of anxiety and depression (Krueger, 1999; Regier et al., 1998; Weinstock and Whisman, 2006).

Measures

Young Adult Psychiatric Disorder

Young adult 12-month and lifetime psychiatric disorder were diagnosed based on the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders criteria (APA, 1987) using the World Health Organization's Composite International Diagnostic Interview (World Health Organization, 1990), a fully structured diagnostic interview with adequate reliability and validity (Wittchen, 1995). Three categories of 12-month and lifetime psychiatric disorder were used in this study: mood disorder (major depression and dysthymia), anxiety disorder (panic disorder, agoraphobia without panic disorder, social phobia, simple phobia, and generalized anxiety disorder), and substance use disorder (alcohol abuse no dependence, alcohol dependence, drug abuse no dependence, drug dependence). Composite variables indicating presence of disorder from any of the 3 categories for 12-month and lifetime disorders were created.

Parental Depression

History of parental depression was assessed using the Family History Research Diagnostic Criteria Interview, a widely used, reliable measure of family psychiatric history (Andreasen et al., 1977). If a participant responded positively when asked, "Did your father (mother) ever have periods lasting ≥2 weeks when he (she) was depressed, down in the dumps, or blue most of the time?" the interviewer went on to pose a series of 9 questions regarding symptoms of depression that correspond to Criterion A of the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders major depressive episode. A symptom count score was computed, representing the number of symptoms endorsed for each parent. If 2, 3, or 4 symptoms were endorsed, the parent was considered to have a history of minor depressive episode. If ≥5 symptoms were endorsed, the parent was considered to have a history of major depressive episode.

Statistical Analysis

The September 9, 2008 version of the NCS public use data was obtained from the Interuniversity Consortium in Political and Social Research (Kessler, 2008). Data were weighted to adjust for probability of selection and differential nonresponse as well as to ensure the subsample was representative of the United States population according to NCS stipulations. For additional information on weighting, see Kessler et al., 1994. Standard errors and significance tests were calculated using the Taylor linearization approach to account for the complex survey design. Data were analyzed using Stata software version 10.0 (Stata Corp., 2007).

The design-based Pearson *chi-square* test corrected for survey design and 1-way analysis of variance were performed to compare the demographic characteristics of participants including age, gender, race/ethnicity, level of education, income, employment status, and marital status across the 3 parental depression categories. The possibility of an over reporting bias associated with young adult offspring mood disorder was also evaluated using the Pearson *chi-square* test. Two sets of logistic regression models were fit to test our hypotheses. The first set of models examined whether having a parent with a history of major depression or a history of minor depression increased the risk of 12-month and lifetime mood, anxiety, substance use, or any disorder among offspring when compared with having nondepressed parents. The second set of models assessed whether risk for psychopathology was greater for young adults whose parent had major depression when compared with minor depression. Potential confounders including young adult gender, race, highest level of education achieved and employment status were controlled for in both models.

RESULTS

Sample Characteristics

The study sample consisted of 1255 young adult offsprings ranging in age from 18 to 29. The average age was 23.5 years ($SD = 3.5$) and 51% were men ($n = 635$). The majority of the sample was white (70%), 75% were employed, and 40% were married or living with a partner. Approximately 25% of the young adult participants had a parent with either minor (9%) or major (15%) depression. Table 1 displays participant characteristics by parental depression status (no parental depression, minor parental depression, and major parental depression).

Over 45% of participants met criteria for any lifetime disorder by young adulthood; 30% reported a substance use disorder, 22% reported an anxiety disorder, and 13% reported a mood disorder. Approximately 30% of participants met criteria for a 12-month disorder. Among participants with a 12-month disorder, anxiety disorders were most frequently reported (17%) followed by substance use (16%) and mood disorders (8%). For both lifetime and 12-month disorder and across all categories of disorder, prevalence varied according to parental depression status. Twenty-seven percent of participants whose parents had no lifetime history of depression met criteria for any 12-month disorder compared with 45% of participants with parental history of minor depression and 48% of participants with parental history of major depression ($F = 16.81$, $p < 0.000$). Similarly, 42% of participants whose parents had no

TABLE 1. Sample Socio-Demographic Characteristics

	NoPD (n = 949)	MinPD (n = 116)	MajPD (n = 190)	F	p
Age in years, mean (SD)	23.5 (3.6)	23.6 (3.3)	23.7 (3.3)	0.27	0.76
Gender, n (%)					
Male	502 (52.9)	55 (47.7)	78 (41.1)	3.73[a]	0.03
Female	447 (47.1)	61 (52.3)	112 (58.9)		
Race/ethnicity, n (%)					
White	660 (69.5)	83 (71.7)	142 (74.7)	2.18[a]	0.07
Black	153 (16.2)	12 (10.4)	23 (11.9)		
Hispanic	93 (9.8)	20 (17.1)	15 (7.9)		
Other	43 (4.5)	1 (0.8)	10 (5.5)		
Years of education, n (%)					
0–11	144 (15.2)	16 (13.3)	38 (20.2)	2.23[a]	0.05
12	359 (37.7)	58 (50.1)	66 (34.7)		
13–15	303 (32.0)	29 (25.2)	46 (24.3)		
16+	143 (15.1)	13 (11.4)	40 (20.8)		
Employment status, n (%)					
Employed	708 (74.6)	88 (76.4)	139 (73.1)	2.34[a]	0.04
Student	140 (14.8)	16 (13.6)	15 (8.2)		
Homemaker	48 (5.1)	5 (4.1)	17 (8.8)		
Other	53 (5.5)	7 (5.9)	19 (9.9)		
Income, n (%)					
$0–19,999	314 (33.1)	47 (40.1)	72 (37.8)	0.95[a]	0.44
$20,000–34,999	264 (27.8)	37 (32.0)	46 (24.3)		
$35,000–69,999	258 (27.2)	25 (21.7)	51 (26.7)		
$70,000+	113 (11.9)	7 (6.2)	21 (11.2)		
Marital status, n (%)					
Never Mar/Cohab	520 (54.8)	58 (50.2)	94 (49.7)	1.49[a]	0.22
Mar/Cohab	373 (39.3)	54 (46.6)	78 (41.2)		
Sep/Div/Wid	56 (5.9)	4 (3.2)	18 (9.1)		

NoPD indicates no parental depression; MinPD, parental minor depression; MajPD, parental major depression.
[a]The Pearson *chi-square* statistic has been corrected for the survey design and converted into an F statistic.

lifetime history of depression met criteria for any lifetime disorder, whereas 61% of participants with parental history of minor depression and 68% of participants with parental history of major depression met criteria for any lifetime disorder ($F = 17.75$, $p < 0.000$).

Assessing Participant Bias

The possibility that depressed participants would be more likely to report a history of depression in their parents was assessed by comparing rates of parental depression reported by young adult participants with current versus remitted mood disorder. Participants meeting criteria for 12-month mood disorder were no more likely than those meeting criteria for lifetime but not 12-month mood disorder to report parents as depressed versus nondepressed ($F = 0.26$, $p = 0.61$), or to report parental history of major depression versus parental history of minor depression ($F = 0.15$, $p = 0.84$).

Risk of Psychopathology Associated With Parental Depression

The first set of logistic regression models examined whether having a parent with major depression or a parent with minor depression increased the risk of lifetime or 12-month mood, anxiety, or substance use disorder in young adult offspring when compared with having nondepressed parents (Table 2). The findings provide support for our first hypothesis: parental depression was significantly associated with increased risk for lifetime and 12-month young adult offspring psychopathology. When controlling for young adult gender, race, highest level of education achieved and employment status, having a mother with depression was associated with almost 3 times greater odds of any lifetime disorder by young adulthood and having a father with depression was associated with >2 times the odds of any lifetime disorder by young adulthood when compared with having nondepressed parents. Both maternal and paternal depression were significantly associated with increased risk for lifetime and 12-month prevalence of mood, anxiety, and substance use disorders among young adult offspring.

Risk of Psychopathology Associated With Major Versus Minor Parental Depression

The second set of logistic regression models investigated whether the risk for young adult offspring psychopathology was greater for those with parental major depression when compared with parental minor depression (Table 3). As predicted, risk of 12-month disorder did not differ significantly between young adults whose mother or father had minor depression versus those whose mother or father had major depression. However, risk for a lifetime mood or anxiety disorder was increased for participants with maternal major depression compared with maternal minor depression. There were no significant differences between maternal major depression and maternal minor depression for lifetime history of substance use disorder. Risk for lifetime young adult mood, anxiety,

TABLE 2. Risk of Psychopathology Associated With Maternal and Paternal Depression[a]

	Offspring 12-Month Disorder				Offspring Lifetime Disorder			
	Maternal Depression = 1159		Paternal Depression = 1045		Maternal Depression = 1159		Paternal Depression = 1045	
	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Mood								
NoPD	1.00	—	1.00	—	1.00	—	1.00	—
MinPD	2.58***	(1.75–3.79)	3.19***	(2.00–5.07)	2.33***	(1.65–3.29)	2.32***	(1.58–3.41)
MajPD	3.73***	(2.85–4.88)	2.03**	(1.28–3.21)	3.60***	(2.94–4.40)	2.57***	(1.87–3.54)
Anxiety								
NoPD	1.00	—	1.00	—	1.00	—	1.00	—
MinPD	2.20***	(1.63–2.96)	1.56*	(1.02–2.40)	1.75***	(1.33–2.29)	2.37***	(1.59–3.54)
MajPD	2.33***	(1.87–2.90)	2.18***	(1.55–3.05)	2.36***	(1.96–2.84)	1.94***	(1.43–2.63)
Substance use								
NoPD	1.00	—	1.00	—	1.00	—	1.00	—
MinPD	1.64**	(1.16–2.34)	1.83*	(1.11–3.03)	1.48**	(1.13–1.93)	1.97**	(1.25–3.09)
MajPD	1.89***	(1.48–2.40)	1.76**	(1.20–2.58)	2.01***	(1.63–2.48)	1.54**	(1.14–2.07)
Any								
NoPD	1.00	—	1.00	—	1.00	—	1.00	—
MinPD	2.20***	(1.66–2.92)	2.09***	(1.41–3.10)	1.79***	(1.32–2.43)	2.53***	(1.58–4.05)
MajPD	2.52***	(2.06–3.08)	2.28***	(1.76–2.95)	2.81***	(2.22–3.54)	2.15***	(1.56–2.95)

NoPD indicates no parental depression; MinPD, parental minor depression; MajPD, parental major depression; OR, odds ratio; CI, confidence interval.
[a]Adjusted for gender, race, education, and employment status.
*$p < 0.05$, ** $p < 0.01$, ***$p < 0.001$.

TABLE 3. Risk of Psychopathology Associated With Minor Versus Major Maternal and Paternal Depression[a]

	Offspring 12-Month Disorder				Offspring Lifetime Disorder			
	Maternal Depression = 1159		Paternal Depression = 1045		Maternal Depression = 1159		Paternal Depression = 1045	
	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Mood								
MinPD	1.00	—	1.00	—	1.00	—	1.00	—
MajPD	1.45	(0.98–2.13)	0.64	(0.34–1.19)	1.54*	(1.09–2.19)	1.11	(0.72–1.71)
Anxiety								
MinPD	1.00	—	1.00	—	1.00	—	1.00	—
MajPD	1.06	(0.81–1.39)	1.39	(0.84–2.30)	1.35**	(1.07–1.71)	0.82	(0.52–1.30)
Substance use								
MinPD	1.00	—	1.00	—	1.00	—	1.00	—
MajPD	1.15	(0.82–1.61)	0.96	(0.55–1.68)	1.36	(0.99–1.87)	0.78	(0.47–1.31)
Any								
MinPD	1.00	—	1.00	—	1.00	—	1.00	—
MajPD	1.14	(0.85–1.54)	1.09	(0.71–1.68)	1.57**	(1.10–2.23)	0.85	(0.48–1.49)

NoPD indicates no parental depression; MinPD, parental minor depression; MajPD, parental major depression; OR, odds ratio; CI, confidence interval.
[a]Adjusted for gender, race, education, and employment status; participants with no parental depression were included in the analysis but are not shown in this table for ease of interpretation.
*$p < 0.05$, **$p < 0.01$.

substance use, and any disorder did not differ by severity of paternal depression.

DISCUSSION

This study examined the association of parental depression with mood, anxiety, and substance use disorders among young adult offspring using nationally representative data. Consistent with previous research (Lieb et al., 2002a), maternal and paternal depression were each associated with significantly higher rates of lifetime and 12-month mood, anxiety, and substance use disorders among offspring. Participants with a depressed mother were 2.5 times as likely to experience a psychiatric disorder by young adulthood when compared with participants with a nondepressed mother, and participants with a depressed father were over 2 times as likely to experience a psychiatric disorder when compared with those with a nondepressed father. The association was most pronounced for

risk of mood disorders among participants with a depressed mother, for whom mood disorder prevalence was over 3.5 times greater than for those with a nondepressed mother. By contrast, participants with a depressed father were approximately twice as likely to experience a mood disorder when compared with those with a nondepressed father.

This study also assessed whether severity of parental depression influenced the intergenerational transmission of psychiatric disorders. Although major and minor parental depression were both associated with increased risk of offspring psychiatric disorders regardless of the parent's gender, the relative influence of parental major versus minor depression differed somewhat as a function of parent gender. Risk of offspring psychopathology was not significantly lower for those whose parent had minor depression when compared with those whose parent had major depression, with 2 exceptions relating to maternal depression severity. Maternal major depression was associated with greater risk of offspring lifetime mood and anxiety disorders than maternal minor depression. This pattern of findings suggests maternal severity may influence offspring vulnerabilities selectively (i.e., offspring depression and anxiety but not substance use disorders), perhaps via maternal modeling of specific emotion regulation strategies. We did not observe increased offspring risk for any lifetime or 12-month psychiatric disorders as a function of paternal depression severity, which may reflect the fact that mothers generally take a more active role in childrearing than fathers and are thus more influential in modeling emotion regulation and coping skills. However, findings regarding the relative influence of paternal minor versus major depression should be interpreted with some caution given the relatively small number of participants with a depressed father.

Our finding that parental depression across a spectrum of severity is associated with psychopathology among offspring has implications for the conceptualization of depression. The spectrum or continuity hypothesis posits that diagnosable cases of depression differ only in degree from symptoms of depression not meeting Diagnostic and Statistical Manual of Mental Disorders criteria for a diagnosis (Solomon et al., 2001). In contrast, the categorical perspective suggests that there is a qualitative difference between diagnosable depression and depressive symptoms (Solomon et al., 2001). The fact that both major and minor parental depressions were associated with offspring psychopathology indicates that subthreshold states have the potential to significantly influence offspring mental health outcomes. However, it is noteworthy that having a parent with depression (vs. no parents with depression) was more strongly predictive of offspring risk for psychopathology than was the distinction between having a parent with major versus minor depression.

This study has certain limitations. First, given the cross-sectional design, we cannot establish the temporal relation between parent and offspring disorder, and we cannot infer a causal pathway between the former and latter. Second, findings regarding the association of paternal major and minor depression with offspring psychiatric disorder should be interpreted with some caution given that the number of participants reporting a depressed father was considerably smaller than the number reporting a depressed mother. Third, although the family history measure of parental depression used in this study has adequate to good sensitivity for affective disorders (Andreasen et al., 1977) and is commonly used for the collection of data on family psychopathology (for example, Coryell et al., 2000; Grekin et al., 2005; Johnson and Bennett, 1995), this method has potential for some degree of measurement bias. Most notably, informants with a history of psychiatric illness may have a greater tendency to report psychiatric illness in a relative than informants without such a history (Chapman et al., 1994; Kendler et al., 1991). However, one study found no evidence of differential sensitivity for parental psychopathology as a function of offspring mental disorders (Lieb et al., 2002b), and another reported that the family history method did not seem biased when assessing lifetime, rather than current, depression (Zimmerman et al., 2006). In our sample, reporting of lifetime parental depression—and of major versus minor parental depression—did not vary based on whether participants' depression was current or remitted, suggesting that current depression did not bias offspring recall of the presence or severity of parental psychopathology. Although our findings should be evaluated with those limitations in mind, this study provides a preliminary assessment to guide further work on the influences of parental major and minor depression on the intergenerational transmission of psychopathology.

CONCLUSIONS

The results of this study indicate an association between parental depression and increased risk of young adult offspring psychiatric disorder and suggest that the influence of parental minor depression may be significant and in some cases comparable in magnitude with that of parental major depression. At the same time, the results suggest that severity of maternal depression may have prognostic implications, given that maternal major depression displayed a particularly deleterious influence on risk for offspring mood and anxiety disorders. Future research using clinical diagnostic interviews to assess histories of maternal and paternal major and minor depression will be critical in extending this work. Our findings offer a preliminary indication that programs aiming to prevent the intergenerational transmission of depression may do well to target parental symptoms of depression, even if criteria for major depressive disorder are not met, to limit risk to offspring. Minor depression seems to be a mental health problem in its own right, one worthy of clinical attention and continued research.

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