

HISTORY OF PARENTING AND BIPOLAR SPECTRUM DISORDERS

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The present study examined whether negative parenting characteristics are associated with offspring's bipolar spectrum diagnoses. Individuals with bipolar spectrum disorders and matched normal controls completed measures of the parenting behaviors their parents exhibited while the individuals were growing up. Lower levels of acceptance/warmth from mothers and higher levels of negative psychological control from mothers and fathers were associated with bipolar spectrum diagnoses, controlling for a family history of bipolar disorder and current depressive and hypomanic mood and symptoms. Similarly, greater levels of emotional maltreatment by mothers and fathers and greater levels of physical maltreatment by mothers were associated with participants' bipolar diagnoses, controlling for family history and current mood and symptoms. Implications of these findings are discussed.

Genetic and biological processes are important in understanding bipolar disorder, however, these factors do not entirely account for individual differences in the expression of bipolar illness or the timing, polarity, and frequency of symptoms (O'Connell, 1986). Findings suggest that psychosocial processes may also affect the onset

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and course of bipolar disorders (Alloy et al., 2005; 2006a,b,c; Ellicott, Hammen, Gitlin, Brown, & Jamison, 1990; Johnson & Roberts, 1995). Further, research has indicated that early environmental stressors may affect the development and course of bipolar spectrum disorders (e.g., Alloy et al., 2006a; Grandin, Alloy, & Abramson, in press; Hammersly, Dias, Todd, Bowen-Jones, Reilly, & Bentall, 2003; Leverich et al., 2002). An examination of these early psychosocial stressors is important, as there are potential long-lasting consequences of early adverse experiences on affective behavior, neurochemistry, and brain structure (Leverich et al., 2002). Further, Post, Leverich, Xing, and Weiss (2001) provided data indicating that early psychosocial stressors can interact with the neurobiology of bipolar disorder, implicating a more severe course of the disorder.

In addition, other researchers argue that maltreatment, particularly sexual abuse, can interfere with a child's ability to regulate their emotions by promoting chronic arousal (Cloitre, 1998). Further, the family environments of children exposed to abuse often do not provide the child with learning opportunities to develop affect regulation skills (Cloitre, 1998). This is particularly important, given that emotion dysregulation and mood swings are central features of bipolar spectrum individuals (Cicchetti, Ganiban, & Barnett, 1991; Goodwin & Jamison, 1990; Leibenluft, Charney, & Pine, 2003). Thus, an examination of the early family environment of bipolar individuals may contribute to an understanding of symptom development and course.

NEGATIVE FAMILY FUNCTIONING AND THE PRESENTATION AND SEVERITY OF BIPOLAR DISORDERS

Several studies have examined negative parenting and communication styles among family members of individuals with bipolar spectrum disorders (see Alloy et al., 2006a for a review). These studies suggest that certain aspects of family functioning may affect the clinical presentation and severity of bipolar disorder. One study found that within Bipolar I and II groups, those with a history of comorbid dysthymia gave significantly lower ratings for expressiveness in the family, whereas those with a history of past suicide attempts reported significantly lower levels of family cohesion (Cooke, Young, Mohri, Blake, & Joffe, 1999).

Other studies focused more specifically on the parenting styles exhibited by bipolar individuals' parents. Many of these studies examined a pattern of parenting characterized by Parker (1983) as "affectionless control," consisting of low levels of expression of affection, and emotional support (low warmth or care) as well as psychological control in the form of intrusiveness, parental direction, and induction of guilt and withdrawal of love (overprotection; Parker, Tulving, & Brown, 1979). Parker (1979) and Joyce (1984) found no differences between bipolar patients' and general practice patients' parents on the dimensions of care and overprotection. However, Joyce (1984) did find that within the bipolar group, those who reported low care and high overprotection had more hospitalizations for both depression and mania, suggesting that these parenting dimensions may be associated with the severity of the disorder. A third study compared unipolar, bipolar, neurotic-reactive, and unspecified depressed patients with normal controls and found that only the unipolar and unspecified depression groups reported significantly lower levels of emotional warmth from parents compared to controls (Perris, Arrindell, Eisemann, Van der Ende, & Knorr, 1986). Further, only the unipolar group exhibited significantly greater levels of maternal overprotection and perceived both parents as more rejecting compared to controls. However, these earlier studies are also limited methodologically by the absence of standardized diagnoses of bipolar disorder (e.g., Parker, 1979), lack of adequate normal control groups containing exclusion criteria (e.g., Joyce, 1984; Parker, 1979; Perris, 1986), and small samples of bipolar patients (e.g., Perris, 1986).

Two more recent studies improving upon these limitations obtained support for an association of negative parenting history with bipolar disorder. Youths with prepubertal or early adolescent bipolar disorder with or without ADHD (PEA-BP) were compared to youths with ADHD and community controls screened for bipolar disorder, major depressive disorder, and ADHD (Geller et al., 2000). Geller et al. (2000) found that compared to both individuals with ADHD and community controls, the PEA-BP youths evidenced greater impairment on a child-parent interaction item measuring maternal warmth and maternal and paternal tension/hostility. Rosenfarb, Becker and Khan (1994) also found that individuals with DSM-III bipolar disorder or unipolar depression reported lower levels of maternal affection compared to a normal control group

screened for depression and/or current and previous psychiatric treatment.

Another body of literature has found that high criticism and emotional overinvolvement (high "expressed emotion or EE") from family members is predictive of a worse course of bipolar disorder. Miklowitz, Goldstein, Nuechterlein, Snyder, and Mintz (1988) found that bipolar individuals who experienced high levels of negative family interactions or attitudes were five times more likely to relapse within nine months of hospital discharge. Similarly, Priebe, Wildgrube, and Muller-Oerlinghausen (1989) reported that bipolar or schizoaffective patients with high EE relatives had eight times the prospective morbidity rate (hospital admissions, symptoms, additional medications) than patients with low EE relatives. A third study followed manic or schizoaffective patients and their relatives for nine months with direct observations of family interactions (Rosenfarb, Miklowitz, Goldstein, Harmon, Nuechterlein & Rea, 2001). Patients' higher relapse rates were associated with high rates of harshly critical and directly supportive statements from patients' family members.

CHILDHOOD MALTREATMENT AND THE DEVELOPMENT AND PRESENTATION OF BIPOLAR DISORDERS

Researchers also have examined the relationship between childhood physical and sexual maltreatment and adult bipolar disorder (see Alloy et al., 2006a for a review). Overall, the results provide mixed support for this association. Coverdale and Turbott (2000) found that individuals with schizophrenia and bipolar disorder did not report experiencing greater levels of physical and sexual abuse in childhood compared to normal controls and Wexler et al. (1997) found that bipolar participants reported lower levels of childhood abuse compared to unipolar depressives. In contrast, two other studies found that individuals with bipolar disorder reported greater levels of childhood maltreatment compared to unipolar depressives (Hyun et al., 2000; Levitan et al., 1997), although, the specific pattern of the findings differed in the two studies. Whereas Levitan et al. (1997) found that bipolar individuals reported significantly greater levels of childhood physical, but not sexual, maltreatment compared to unipolar depressives, Hyun et al. (2000) found that bipolar individuals only reported significantly greater levels of

sexual abuse compared to unipolar depressives. Yet another study found that reported childhood maltreatment occurring after the "age of onset" of bipolar symptoms was associated with bipolar versus normal control status, controlling for family history of mood disorder as well as participants' current hypomanic and depressive symptoms (Grandin, Alloy, & Abramson, 2007). However, Grandin et al. found that childhood stressors that were independent of the person's behavior (e.g., family deaths) and that occurred prior to the age of onset of bipolar symptoms were associated with a bipolar spectrum diagnosis.

The inconsistencies across studies may be due to the different samples assessed and the various methodologies employed. For example, some studies were of outpatients (e.g., Coverdale & Turbott, 2000; Hyun et al., 2000; Wexler et al., 1997), whereas others examined community samples (e.g., Levitan et al., 1997), or college students with bipolar disorders (e.g., Grandin, Alloy, & Abramson, 2007). Further, some studies utilized structured interviews to assess bipolar disorders (e.g., Grandin, Alloy, & Abramson, 2007; Hyun et al., 2000; Levitan et al., 1997), whereas others examined medical records or reviewed patient charts (e.g., Coverdale & Turbott, 2000; Wexler et al., 1997). Similarly, different methods were used to obtain histories of child abuse, as some studies used semi-structured interviews (e.g., Coverdale & Turbott, 2000; Hyun et al., 2000) and others used self-report questionnaires (e.g., Grandin, Alloy, & Abramson, 2007; Levitan et al., 1997).

Although there is mixed support for the association of childhood maltreatment and bipolar disorders, results indicate a more consistent relationship between early maltreatment and the clinical presentation of bipolar disorder. For example, Leverich et al. (2002) reported that a history of early physical or sexual abuse was associated with a higher incidence of early illness, faster cycling frequencies, suicide attempts, lifetime Axis I and Axis II disorders, including alcohol and substance abuse, as well as a higher incidence of psychosocial stressors reported as occurring prior to both the first and the most recent affective episodes among bipolar outpatients. In a second study, a history of childhood trauma was associated with an increased experience of auditory hallucinations among bipolar individuals (Hammersly et al., 2003).

LIMITATIONS OF STUDIES ON NEGATIVE PARENTING AND CHILDHOOD MALTREATMENT AND BIPOLAR DISORDER

Several limitations plague these bodies of literature as a whole. First, all of the studies reviewed examined reports of parenting and childhood maltreatment after a diagnosis of bipolar disorder had been made. With the exception of two studies (Grandin, Alloy, & Abramson, 2007; Hammersly et al., 2003), most investigators failed to distinguish between maltreatment and negative parenting practices that preceded the onset of bipolar disorder and those that followed. One cannot rule out the possibility that certain behaviors that bipolar individuals may have exhibited in childhood led to less favorable parenting practices and/or maltreatment. Therefore, one cannot conclude that negative parenting practices and maltreatment are risk factors for bipolar disorder. Instead, they may be concomitants or consequences of bipolar symptomatology. Findings would be strengthened if the investigators ascertained whether negative parenting/maltreatment behaviors occurred prior to the age of onset of bipolar symptoms.

A second limitation is that many studies were either uncontrolled (e.g., Leverich et al., 2002) or utilized psychiatric controls as a comparison group to bipolar individuals, and did not include a comparison group of normal healthy controls (e.g., Hyun et al., 2000; Levitan et al., 1997; Wexler et al., 1997). Further, many of the studies that did include a normal control group failed to use adequate exclusion criteria within the control group, which may have biased results (e.g., Coverdale & Turbott, 2000; Joyce, 1984; Parker, 1979; Perris, 1986). Third, with the exception of two studies (Cooke et al., 1999; Grandin, Alloy, & Abramson, 2007), the current mood state of participants was not controlled. This is problematic because current mood may have biased participants' perceptions of behaviors reported. Similarly, only one study (e.g., Grandin, Alloy, & Abramson, 2007) controlled for participants' family history of bipolar disorder, which would help to rule out a purely genetic basis for any obtained association between negative parenting practices and/or childhood maltreatment and bipolar disorder. Fourth, many of the studies did not use structured interviews to diagnose bipolar disorder (e.g., Coverdale & Turbott, 2000; Parker, 1979; Wexler et al., 1997). Fifth, only two of the existing maltreatment studies examined

who the perpetrator was (Coverdale & Turbott, 2000; Hammersly et al., 2003). Although both of these studies assessed the frequency of perpetrators who were blood relatives, to our knowledge, no study has examined the effects of parental maltreatment specifically. Similarly, to our knowledge, no study has examined whether there is an association of childhood emotional maltreatment (not just physical and sexual abuse) and adult bipolar disorder.

OVERVIEW OF THE PRESENT STUDY

The aim of the present study was to examine reported histories of negative parenting and parental maltreatment among individuals with bipolar spectrum disorders and normal control participants while addressing the aforementioned methodological issues. Thus, we compared bipolar spectrum individuals and demographically matched normal controls utilizing standardized diagnoses of bipolar spectrum disorders and clearly defined exclusion criteria for the normal control participants. Further, in all analyses, we controlled for participants' current mood state and family history of mood disorder. It was hypothesized that individuals with bipolar spectrum disorders would report lower levels of parental warmth/acceptance, greater levels of parental negative psychological control, and greater levels of parental emotional, physical, and sexual maltreatment than would demographically matched normal controls.

METHOD

This study was based on a larger, two-site investigation, the Longitudinal Investigation of Bipolar Spectrum (LIBS) Disorders Project, examining psychosocial, cognitive, and biological predictors of the course of bipolar spectrum disorders [i.e., bipolar II (Bi II) disorder, cyclothymia (Cyc), bipolar NOS (Bi NOS) and the onset of Bi I disorder. Data from both sites (Temple University [TU] and University of Wisconsin [UW]) were used in the current study.

Participants

Participants were students between the ages of 18-24 selected based on a two-phase screening process for the LIBS project. In Phase I,

approximately 20,500 students at TU and UW were administered the General Behavior Inventory (GBI; Depue, Krauss, Spoont, & Aribisi, 1989; see *Measures* below) to identify potential bipolar spectrum cases and potential normal controls. GBI scores among these participants ranged from 0 – 46 on the Depression subscale ($M = 6.33$, $SD = 8.48$) and from 0 – 29 on the Hypomanic/Biphasic subscale ($M = 4.50$, $SD = 5.07$). A subset of participants who either met the cutoff criteria for potential bipolar spectrum (Hi GBI scores) or for the absence of affective psychopathology (Lo GBI scores) proceeded to the next stage (see *Measures* below). In Phase II, these 1,730 participants were administered a structured lifetime diagnostic interview (expanded SADS-L; Schedule of Affective Disorders and Schizophrenia-Lifetime Version; see *Measures*, below), conducted by trained interviewers blind to participants' GBI scores. Diagnoses were assigned based on the *DSM-IV* (American Psychiatric Association, 1994) and Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robins, 1978). Based on the expanded SADS-L interview and the GBI, two groups were identified:

- (1) individuals who met GBI cutoff criteria for bipolar spectrum *and* the *DSM-IV* or RDC criteria for either Cyclothymic Disorder (Cyc), Bipolar II disorder (Bi II), or Bipolar disorder not otherwise specified (BiNOS);¹ and
- (2) individuals who met both GBI cutoff criteria for absence of affective psychopathology and *DSM-IV* or RDC criteria for no Axis I psychopathology (control group). These participants were demographically matched (on age, sex, ethnicity) and invited to participate in the longitudinal study. All interviews were tape recorded for the purposes of obtaining consensus diagnoses and interrater reliability checks.

1. The Bipolar NOS diagnosis included individuals who exhibited recurrent hypomanic episodes without diagnosable depressive episodes, individuals who exhibited a cyclothymic pattern but with hypomanic and depressive periods that did not meet minimum duration criteria for hypomanic and depressive episodes, and individuals with hypomanic and depressive periods that were too infrequent to qualify for a cyclothymia diagnosis. Participants who met criteria for Bipolar I disorder were excluded because one of the aims of the larger longitudinal LIBS Project was to predict conversion to Bipolar I status over time.

TABLE 1. Demographic Characteristics of the Sample

Temple Site	Bipolar Spectrum	Normal Controls
N	101	101
Mean Age (years)	20.66 (1.91)	21.03 (2.12)
Sex	65.3% Women	68.3% Women
Ethnicity	53.0% Caucasian	55.6% Caucasian
Wisconsin Site	Bipolar Spectrum	Normal Controls
N	116	118
Mean Age (years)	20.45 (1.60)	20.67 (1.43)
Sex	54.3% Women	53.4% Women
Ethnicity	86.3% Caucasian	89.0% Caucasian

Note. Standard deviations are in parentheses.

The final longitudinal LIBS Project sample consisted of 206 bipolar spectrum participants (149 Bi II, 57 Cyc/BiNOS) and 214 normal controls. However, the data of 217 bipolar spectrum participants (159 Bi II, 58 Cyc/BiNOS) and 219 normal controls were used for the current study (including 11 bipolar and 5 normal participants who completed Time 1 but did not continue in the longitudinal study). The sample demographics are presented in Table 1. The TU and UW cohorts differed on ethnicity and gender, but not on age. The TU sample included a significantly larger percentage of minority participants (45.7%) than the UW sample (12.3%), $\chi^2(1) = 60.05$, $p < .001$, and also had a significantly higher proportion of women (66.8%) compared to the UW sample (54.0%), $\chi^2(1) = 7.34$, $p < .01$. The combined (across sites) normal control and bipolar groups did not differ on age, gender, or ethnic composition. At Time I, 15.2% ($n = 33$) of these 217 bipolar spectrum participants were receiving treatment for their disorder and 2.3% ($n = 5$) exhibited suicidal ideation or attempts. Table 2 provides the means and standard deviations of the groups' GBI scores and initial symptom scores.

Measures

General Behavior Inventory (GBI). The GBI is a 73-item self-report inventory designed to identify unipolar and bipolar affective conditions on a lifetime or trait basis. The GBI has good internal consistency (α 's=.90-.96), test-retest reliability (r 's = .71-.74), adequate sensitivity (.78), and high specificity (.99) for bipolar spectrum con-

TABLE 2. Means and Standard Deviations of Current Symptoms, Parenting, and Maltreatment Measures

Current Symptoms, Negative Parenting and Maltreatment Measures	Bipolar Spectrum			Normal Controls		
	N	M	SD	N	M	SD
BDI-II	179	9.42	7.98	189	2.08	2.65
HMI	181	13.66	6.90	195	12.31	5.42
GBI-D	217	24.41	9.41	219	2.08	2.82
GBI-HB	217	17.12	4.02	219	2.76	3.35
NC-F	207	25.00	7.09	214	21.36	4.76
AC-F	207	44.70	11.40	214	50.00	10.28
NC-M	215	27.62	8.03	214	23.27	5.66
AC-M	215	49.48	11.03	214	55.35	7.76
EM-F	195	2.06	3.03	161	.59	1.14
EM-M	195	2.51	3.36	161	.67	1.20
PM-F	195	.55	1.16	161	.28	.55
PM-M	195	.61	1.17	161	.30	.55
SM-F	195	.09	.44	161	.006	.08
SM-M	195	.07	.32	161	.006	.08

Note. BDI-II = Beck Depression Inventory-II; HMI = Halberstadt Mania Inventory; GBI-D = General Behavior Inventory, depression items; GBI-HB = General Behavior Inventory, hypomania/mania and biphasic items; NC = Negative control; AC = Acceptance; EM = Emotional Maltreatment; PM = Physical Maltreatment; SM = Sexual Maltreatment; F = participants' reports of fathers on specified dimensions; M = participants' reports of mothers on specified dimensions.

ditions (Depue et al., 1981; 1989). Moreover, the GBI has been extensively validated in college, psychiatric outpatient, and offspring of bipolar I samples (Depue et al., 1989). The items are divided into three general categories: depression, hypomania/mania, and biphasic (items that describe both depressive and hypomanic behaviors). The inventory provides comprehensive coverage of all somatic, vegetative, psychomotor, motivational, mood, and cognitive symptoms associated with these affective conditions, with all symptoms having equal weighting. Each of the 73 items are rated on a 4-point scale: 1= never or hardly ever; 2= sometimes; 3= often; and 4= very often or almost constantly. The GBI employs a two-dimensional scoring system to identify potential bipolar spectrum cases (Depue et al., 1989), one score for depression (D) and one for hypomania/mania and biphasic items (HB) combined. Depue et al. (1989) recommended using a case scoring method, in which only items rated a 3

(often) or 4 (very often or almost constantly) contribute toward total D or HB scores. Further utilizing the recommendations of Depue et al. (1989), bipolar conditions are represented by high scores on both the D and HB dimensions. For the LIBS study, a *high GBI* score (i.e., potential bipolar spectrum disorder) was defined as a D scale score ≥ 11 and an HB scale score ≥ 13 . Thus, *low GBI* scores (potential normal controls) were indicated by D scale scores < 11 and HB scale scores < 13 . These cutoffs were based on Depue et al.'s 1989 findings and a LIBS project pilot study in which high and low GBI students, using these cutoffs, were validated against diagnoses derived from expanded SADS-L interviews.

Expanded Schedule for Affective Disorders and Schizophrenia – Lifetime (SADS-L). The SADS-L (Endicott & Spitzer, 1978) is a semi-structured diagnostic interview that assesses both past and current symptomatology in accordance with the RDC criteria. An expanded version of the SADS-L was created for the LIBS Project that gathered information relevant to all Axis I diagnoses based on both RDC and *DSM-IV* criteria. To ensure the clinical validity of our diagnostic procedures for assessing bipolar spectrum disorders, we consulted with experts on bipolar disorders: Drs. Akiskal, Angst, Clayton, Endicott, and Gruenberg. Aided by these consultations, we expanded the SADS-L interviews to enable greater accuracy and reliability in diagnosis of bipolar conditions, including:

- (1) Additional probes to allow for *DSM-IV* as well as RDC diagnoses;
- (2) Expansion of the number of items and improvements in the probes in the Depression, Mania/Hypomania, and Cyclothymia sections;
- (3) Additional probes to assess the precise number of days participants felt depressed or euphoric/irritable and for what percentage of waking hours of each day they felt depressed or euphoric/irritable in the Depression and Mania/Hypomania sections, respectively;
- (4) Improvements of the probes in the Depression, Mania/Hypomania, and Cyclothymia sections based on Depue's (1985) Behavioral Variability Interview;

- (5) Addition of items in the Cyclothymia section that assess the frequency, duration, and switch rapidity of depressive and hypomanic periods;
- (6) Addition of probes to examine the extent to which changes in participants' behavior were noticeable to people in their lives;
- (7) For each symptom item, we utilized a 5 point scale (0 – 4) to make ratings in which 3 was the cutoff for presence of the symptom;
- (8) Past Depression and Mania/Hypomania sections were placed immediately after the corresponding current sections to increase participants' understanding; and
- (9) Sections were added to assess eating disorders, ADHD, and acute stress disorder, additional probes were added in the anxiety disorders section, and an organic rule-out module and medical history section were appended. The age of onset of bipolar disorder was also determined from the expanded SADS-L and was defined as the age at which the first (earliest) hypomanic or depressive episode occurred.

Given that family history of mood disorders may be predictors of the course of bipolar spectrum disorders, we also assessed family history of mood disorders in participants' first degree relatives during Phase II. We used the family history method and the Family History-Research Diagnostic Criteria section (FH-RDC; Andreasen, Endicott, Spitzer, & Winokur 1977), a standard method of assessing family history of psychopathology, as part of our expanded SADS-L interview. The FH-RDC has very good consensus ratings for depressive disorder and manic disorder (k 's between .74-.89), excellent interrater reliability based on two independent raters of 150 interviews of probands who mostly suffered from an affective disorder (k 's .93 and .95 for depressive disorder and manic disorder, respectively), adequate sensitivity for any illness and affective disorder (79% and 59%, respectively), and adequate specificity for any illness and affective disorder (87% and 88%, respectively). Given that the FH-RDC is reliable, family history was not a major focus of the LIBS study, and the family study method would be too costly (i.e., interviewing directly as many relatives as possible about their illnesses), we believe the family history approach was adequate.

The expanded SADS-L has excellent interrater reliability for both unipolar (k 's $\geq .90$; Alloy et al., 2000) and bipolar spectrum diagno-

ses (k 's $\geq .96$ in the LIBS Project). In this study, k 's were $\geq .90$ for all mood disorder diagnoses. Extensively trained research assistants, blinded to participants' Phase I GBI scores, conducted the interviews. (Consensus *DSM-IV* and RDC diagnoses were determined by a 3-tiered standardized diagnostic review procedure involving senior diagnosticians and an expert psychiatric diagnostic consultant, Dr. Alan Gruenberg.)

Parenting Styles. Parenting styles were assessed with the Children's Report of Parental Behavior Inventory (CRPBI, Schaeffer, 1965), a 180-item self-report measure that includes 90 items each regarding the individual's mother and father. The CRPBI yields three scales: acceptance versus rejection (Acceptance), psychological autonomy versus psychological control (Negative Control), and firm control versus lax control (Lax Control). Participants rate whether statements relating to the three dimensions were either "like," "somewhat like," or "not like" how they perceive their mothers and fathers to have behaved during their childhood and adolescence. In this sample, coefficient α 's for the Acceptance, Negative Control, and Lax Control dimensions for participants' reports about their mothers and fathers were .92 and .93, .89 and .88, and .81 and .84, respectively. Convergent validity of the CRPBI has been established in a sample of college students, but discriminant validity has been less successful (Schwartz et al., 1985). Predictive validity for the Acceptance and Negative Control dimensions has been demonstrated with respect to offspring's cognitive vulnerability and episodes of depression (Alloy et al., 2001; Spasojevic & Alloy, 2002).

Parental Maltreatment. Participants' histories of emotional, physical, and sexual maltreatment by parents were assessed using the Life Experiences Questionnaire (LEQ; Gibb et al., 2001), a 92-item self-report measure that assesses history of sexual, physical, and emotional maltreatment as well as emotional and physical neglect committed by both peers and adults. For each of the 92 events, participants indicate whether or not they experienced the event, the age of onset and duration of each event described, its frequency of occurrence, and who the perpetrator was. The LEQ is based on

2. The age of maltreatment events could only be examined on the LEQ, as there is a specific subset of each question that asks the respondent to indicate at what age the event occurred. The CRPBI does not contain questions pertaining to age of onset.

TABLE 3. Partial Correlations among Negative Parenting Dimensions and Diagnosis

	DIAG	NC-F	AC-F	NC-M	AC-M
DIAG	—				
NC-F	.27***	—			
AC-F	-.20**	-.34***	—		
NC-M	.27***	.39***	-.17*	—	
AC-M	-.27***	-.13*	.36***	-.42***	—

Note. Partial Correlations were calculated controlling for a family history of mood disorder and participants' current mood state (BDI and HMI scores). DIAG = Diagnosis; NC = Negative control; AC = Acceptance; F = participants' reports of fathers on specified dimensions; M= participants' reports of mothers on specified dimensions. * $p < .05$, two-tailed. ** $p < .01$, two-tailed. *** $p < .001$, two-tailed.

Cicchetti's (1989) Child Maltreatment Interview, although it is more specific with respect to the assessment of events.

Histories of emotional, physical, and sexual maltreatment by caretakers were determined by summing the number of different maltreatment experiences endorsed as having been committed by parents (i.e., biological, step, adoptive, or other primary caretakers). We only included items reported as occurring prior to the age of onset of bipolar participants' first (earliest) hypomanic or depressive episode. Each bipolar participant was paired with a demographically matched normal control participant and the same cutoff age was used for the normal control individual as the age of onset for their matched bipolar participant (for matching criteria; see Participants).²

Levels of maltreatment were determined by adding up the number of different forms of maltreatment endorsed for each of the categories (i.e., sexual, physical, emotional). Forms of childhood emotional maltreatment assessed include humiliation, rejection, extortion, and teasing. Forms of physical maltreatment assessed include being hit either with a fist or an object, being choked, and being the victim of deliberate physical pain. Forms of sexual maltreatment include unwanted exposure to pornography and exhibitionism, as well as fondling and attempted and completed rape. Examples of items include, "Did anyone ever say they wish you were dead?" (emotional maltreatment), "Did anyone ever try to get you to do what he/she wanted by threatening you or someone you loved with physical harm?" (physical maltreatment), "Did any adult or someone more than five years older than you ever touch you in a sexual way?" (sexual maltreatment). The maltreatment subscales of the LEQ (emotional, physical, and sexual) have been found to corre-

late highly with levels of emotional, physical, and sexual maltreatment reported in structured clinical interviews ($r_s = .78, .79, \text{ and } .87$, respectively; Gibb et al., 2001) and have demonstrated good internal consistency (α 's = $.85, .67, \text{ and } .87$, respectively; Gibb et al., 2001). In this sample, coefficient α 's for the emotional, physical, and sexual maltreatment dimensions for participants' reports about their parents were $.82, .74, \text{ and } .56$, respectively.

Current Mood State. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used to assess participants' levels of depressive symptoms. It is a self-report scale consisting of 21 items scored from 0 to 3 with a range of 0 to 63. The BDI demonstrated high internal consistency, high construct validity, good re-test reliability, and high convergent validity with other measures of depression (Beck, Steer, & Garbin, 1988). Reliability and validity have been demonstrated with college, community, and clinical samples (e.g. Beck et al., 1988).

The Halberstadt Mania Inventory (HMI; Alloy, Reilly-Harrington, Fresco, Whitehouse, & Zechmeister, 1999) is a 28-item self-report inventory that measures current manic or hypomanic symptoms. The HMI was modeled after the BDI format and is thus administered and scored in a similar manner. Many of the items on the HMI have the same wording as the BDI items but substitute key words. For example, a 1-point response on the BDI is "I feel sad," whereas a 1-point response on the HMI is "I feel happy." In a sample of 1,282 undergraduates, the HMI had high internal consistency ($r = .82$), adequate convergent validity ($r = .32, p < .001$) with the mania scale of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1951) as well as discriminant validity ($r = -.26, p < .001$) with the depression scale of the MMPI and ($r = -.12, p < .001$) with the BDI (Alloy et al., 1999). Alloy et al. (1999) provided evidence of the validity of the HMI. The HMI has been validated against clinician-rated hypomania symptom scores from the expanded SADS-Change interview used during the prospective phase of the LIBS project. HMI scores correlated $.46, p < .001$ ($N = 157$) with clinician-rated hypomania symptoms from the SADS-C. The HMI also shows expected changes as cyclothymic individuals cycle through hypomanic, euthymic, and depressed mood states (Alloy et al., 1999).

TABLE 4. Partial Correlations among Parental Maltreatment Dimensions and Diagnosis

	DIAG	EM-F	EM-M	PM-F	PM-M	SM-F	SM-M
DIAG	—						
EM-F	.18**	—					
EM-M	.18**	.64***	—				
PM-F	.08	.49***	.35***	—			
PM-M	.11	.23***	.38***	.59***	—		
SM-F	.08	.26***	.03	.22***	.02	—	
SM-M	.03	.37***	.06	.27***	.04	.70***	—

Note. Partial Correlations were calculated controlling for a family history of mood disorder and participants' current mood state (BDI and HMI scores). DIAG = Diagnosis; EM = Emotional Maltreatment; PM = Physical Maltreatment; SM = Sexual Maltreatment; F = participants' reports of fathers on specified dimensions; M = participants' reports of mothers on specified dimensions. * $p < .05$, two-tailed. ** $p < .01$, two-tailed. *** $p < .001$, two-tailed.

Procedures

Students between the ages of 18-24 at TU and UW were recruited for the LIBS Project via classes and dormitories, campus activities, and advertisements. Potential participants were asked to fill out a questionnaire (the GBI), constituting the first stage of the screening process, and were told that it inquires about a broad range of experiences that some people may have. They were informed that the GBI takes about 20 minutes to complete and were paid \$5 for their voluntary participation. Participants read and signed an Informed Consent form.

Based on participants' GBI scores, they were either invited to the second screening phase or excluded from the process. Specifically, only high and low scoring GBI participants (as described above) were contacted by phone and invited for an interview (with the expanded SADS-L) about their thoughts, feelings, and experiences. All SADS-L's were conducted in person. Based on the SADS-L interview, participants who met the study inclusion and exclusion criteria for a bipolar spectrum case or a normal control were invited into the longitudinal study.

SADS-L interviews were conducted by clinical psychology Ph.D. students or full and part - time diagnostic interviewers. Interviewers were unaware of participants' GBI scores and were given extensive training on both the structure of the expanded SADS-L and the procedure of formulating DSM-IV and RDC diagnoses. Training consisted of 200 hours of group instruction, review of case vignettes and videotaped interviews, role-playing, live practice interviews,

and regular individual and group feedback sessions. All interviews were tape recorded to confirm diagnoses. Consensus DSM-IV and RDC diagnoses were determined by a 3-tiered standardized diagnostic review procedure involving senior diagnosticians and an expert psychiatric diagnostic consultant. Approximately two months after the SADS-L interview, eligible bipolar and normal participants completed a Time 1 assessment, including the CRPBI and LEQ among other measures.

RESULTS

The means and standard deviations of the parenting dimensions on the CRPBI and LEQ as well as participants' current BDI and HMI scores and GBI-D and HB scores are presented in Table 2. To examine whether significant relations existed between the negative parenting and maltreatment dimensions (CRPBI and LEQ) and bipolar diagnosis, partial correlations among negative parenting, parental maltreatment and diagnosis are presented in Tables 3 and 4, controlling for a family history of mood disorder and current depressive and hypomanic symptoms (i.e., BDI and HMI scores).

Association of Negative Parenting Styles and Bipolar Spectrum Diagnosis

Individual logistic regression analyses were conducted for each parenting variable (CRPBI, LEQ) to determine whether each variable was related to bipolar spectrum diagnosis. Family history of unipolar and bipolar disorder and current BDI and HMI scores were entered as covariates in each regression analysis. For each analysis, family history of mood disorder and current hypomanic and depressive symptoms were entered in the first step and the parenting dimension was entered in the second step to predict bipolar spectrum diagnosis. Several parenting style dimensions, as measured by the CRPBI, were significantly associated with bipolar spectrum diagnoses. Participants' reports of mothers' lower acceptance, mothers' greater negative control, and fathers' greater negative control predicted participants' bipolar diagnoses, $Exp(\beta) = 0.95$, $Wald = 9.61$, $p < .01$, $Exp(\beta) = 1.10$, $Wald = 17.18$, $p < .001$, and $Exp(\beta) = 1.06$, $Wald = 4.41$, $p = .04$, respectively. Lower levels of fathers' ac-

ceptance marginally predicted bipolar spectrum diagnosis, $Exp(\beta) = 0.98$, Wald = 2.99, $p = .08$.

Association of Parental Maltreatment With Bipolar Spectrum Diagnoses

We examined only maltreatment events that occurred prior to the age of onset of bipolar symptoms to help rule out the explanation that maltreatment from parents is primarily a reaction to bipolar symptomatology among offspring. A series of logistic regressions were performed, with family history of unipolar and bipolar disorder and current hypomanic and depressive symptoms entered in the first step and the parental maltreatment dimension in the second step to predict bipolar spectrum vs. normal diagnosis. Several parental maltreatment dimensions, as measured by the LEQ, were significantly associated with bipolar spectrum diagnoses. Participants' reports of greater emotional and physical maltreatment by mothers predicted participants' bipolar diagnoses $Exp(\beta) = 1.64$, Wald = 17.21, $p < .001$, $Exp(\beta) = 1.90$, Wald = 7.86, $p < .01$, respectively. Similarly, emotional maltreatment by fathers predicted bipolar spectrum diagnoses, $Exp(\beta) = 1.44$, Wald = 8.83, $p < .01$.

DISCUSSION

The primary goal of this study was to examine the possible relationship between reported histories of negative parenting and parental maltreatment and bipolar spectrum disorders. The negative parenting and maltreatment practices hypotheses were partially supported. Participants who perceived their mothers to show low levels of warmth/acceptance and their mothers and fathers to show high levels of negative control were more likely to be diagnosed with a bipolar spectrum disorder. This result is in accord with findings suggesting that low levels of parental care and high levels of parental overprotection are associated with a more severe presentation of bipolar disorder (e.g., Joyce, 1984; see Alloy et al., 2006a for review).

Also, consistent with our hypotheses, participants who reported that their female caretakers physically maltreated them had an associated bipolar spectrum diagnosis. This finding is consistent with two studies that found that physical abuse was related to bipolarity

(e.g., Leverich et al., 2002; Levitan et al., 1997). Similarly, participants who reported that their male and female caretakers emotionally maltreated them also had an associated bipolar spectrum diagnosis. This is consistent with our finding that bipolar individuals reported higher levels of psychological control from both mothers and fathers compared to normal controls. As Alloy et al. (2001) discuss, a history of childhood emotional maltreatment and parenting characterized by low emotional warmth and psychological control may be seen as falling on a continuum of negative emotional feedback.

In contrast, sexual maltreatment by both male and female caretakers was not associated with bipolar spectrum diagnoses. This finding is in accord with studies that failed to find an association between sexual abuse and bipolar disorder (e.g., Levitan et al., 1997), but is inconsistent with other studies that did find such an association (e.g., Leverich et al., 2002; Hyun et al., 2000). As noted earlier, the reasons for the inconsistencies to date are largely due to the methodological limitations across the small body of literature examining developmental factors in bipolar disorder. These limitations involve the lack of inclusion of an appropriate control group to allow for a determination of whether bipolar individuals' histories differ from those of normals, the failure to control for bipolar participants' mood states at the time their childhood histories are assessed, the lack of standardized diagnoses of bipolar disorders, and the use of retrospective designs. Although the current study improves upon some of these limitations, future prospective studies need to be conducted that address these methodological limitations before any firm conclusions can be drawn.

It is noteworthy that all of the relationships obtained between parenting styles and parental maltreatment and bipolar diagnosis were obtained after controlling for a family history of bipolar disorder and current depressive and hypomanic mood and symptoms. Thus, our results are in accord with the growing literature suggesting that genetic factors alone do not entirely account for the etiology and course of bipolar disorder. In fact, our findings that negative parenting characteristics as well as emotional and physical maltreatment from caretakers are related to offspring's bipolar diagnosis, despite controlling for family history of bipolar disorder, help to rule out purely genetic explanations for the parenting effects. Thus, the results suggest that negative parenting may contribute to the

development of bipolar spectrum diagnoses among offspring over and above any purely genetic transmission of vulnerability to the development of bipolar disorder. Further, our findings suggest that over and beyond current mood-state related reporting biases, bipolar spectrum individuals perceive their parents as less accepting, more controlling, and more physically and emotionally abusive than normal controls.

Despite its promising findings, this study has several important limitations. Primarily, given that participants already had received bipolar spectrum diagnoses prior to the assessment of perceived parenting and parental maltreatment, it is impossible to determine whether negative parenting and/or maltreatment preceded or developed subsequent to individuals' bipolar spectrum disorders. Similarly, the use of retrospective self-report measures to assess parenting dimensions limits the interpretability of our findings. Thus, as is inherent in any retrospective design, it is difficult to decipher the temporal order of events that have happened in the past. Although the maltreatment measure contained a subset of questions that asked for participants' age at which they had specific experiences and we only included in the analyses those experiences that preceded bipolar participants' earliest depressive or hypomanic episode onset, the parenting measure did not assess the participants' ages at the time of the reported parenting. Future studies should implement designs examining the prospective directional relationships among parenting dimensions, childhood maltreatment, and bipolar diagnosis.

Accordingly, the potential bi-directionality of the relationship between the contextual environment and the child's behavior should be emphasized. It is quite possible that prodromal symptomatology in participants diagnosed with bipolar spectrum disorders may have been present developmentally earlier, and, therefore, elicited less accepting and more controlling parenting and physical and emotional maltreatment from primary caregivers. For example, Pettit et al. (2001) found that mothers who perceived their children as having high levels of externalizing behavior exhibited high levels of negative psychological control as a way of controlling their children's behavior. Therefore, we cannot rule out the possibility that certain behaviors that the bipolar spectrum participants may have exhibited in childhood led to less favorable parenting practices, which may have accounted for the cross-sectional relationships.

Another limitation is that this study did not utilize a psychiatric control group. Although we included a normal control group of participants, the findings would be strengthened if a third group of unipolar depressed individuals were included. Finally, future studies should utilize a more comprehensive approach to assessing family history of unipolar and bipolar disorder, such as the family study method. As Andreasen et al. (1977) discuss, the family history used in the current study tends to underestimate the amount of illness among first-degree relatives. Further, the accuracy of the family history method improves as the number of informants increases (Andreasen et al., 1977). Thus, it is possible that the FH-RDC assessment that was utilized in this study was too conservative an approach.

The results of the present study suggest that certain aspects of parenting, including low levels of mothers' warmth/acceptance, high levels of mothers' and fathers' negative control, physical maltreatment from female caretakers, and emotional maltreatment from female and male caretakers, are associated with bipolar spectrum disorders in offspring. Whether such negative parenting practices contribute to the elicitation and course of bipolar spectrum disorders or are a reaction to difficult behaviors presented by offspring with incipient bipolar symptoms remains to be determined in prospective studies.

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