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Authors

Shalev, Amit
Merranko, John
Goldstein, Tina
et al.

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A Longitudinal Study of Family Functioning in Offspring of Bipolar Parents RH = Family Functioning in Bipolar Offspring

Drs. Amit Shalev, MD,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Herman Dana Division of Pediatric psychiatry, Hadassah Hebrew University Medical Center, Jerusalem, Israel

Mr. John Merranko, MS,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Tina Goldstein, PhD,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Dr. David J. Miklowitz, PhD,
Division of Child & Adolescent Psychiatry, UCLA Semel Institute, David Geffen School of Medicine, University of California, Los Angeles

Dr. David Axelson, MD,
Children's Hospital and The Ohio State University, Columbus

Dr. Benjamin I. Goldstein, MD, PhD,
University of Toronto Faculty of Medicine, Ontario, Canada

David Brent, MD, MPH,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Mss. Kelly Monk, RN,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Mary Beth Hickey, BA,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Danella M. Hafeman, MD, PhD,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Dara Sakolsky, MD, PhD,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Rasim Diler, MD,
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Correspondence to Amit Shalev, MD, Western Psychiatric Institute and Clinic, 3811 O'Hara Street, Bellefield Towers – Room 542, Pittsburgh, PA 15213, shalevamit@gmail.com

Boris Birmaher, MD
Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, PA

Abstract

Objective: To compare the longitudinal course of family functioning in offspring of parents with bipolar disorder (BD), offspring of parents with non-BD psychopathology, and offspring of healthy control parents (HC).

Method: Offspring of BD parents (256 parents and 481 offspring), non-BD parents (82 parents and 162 offspring) and HC parents (88 parents and 175 offspring) ages 7–18 at intake, from the Bipolar Offspring Study (BIOS), were followed for an average of 4.3 years. Family functioning was evaluated using the child- and parent-reported Family Adaptability and Cohesion Scale-II (FACES II) and the Conflict Behavior Questionnaire (CBQ). The data was analyzed using multivariate multilevel regression, generalized linear estimating equation models, and path analysis.

Results: Families of BD parents and parents with non-BD psychopathology showed lower cohesion and adaptability and higher conflict as compared with HC families. There were no significant differences in cohesion and adaptability between the families of parents with psychopathology. The effect of parental psychopathology on family functioning was mediated by parental psychosocial functioning, and to a lesser extent, offspring disorders. In all three groups, parent-reported family conflict was significantly higher than child-reported conflict. Across groups, family cohesion decreased over follow-up, whereas conflict increased.

Conclusion: Any parental psychopathology predicted family impairment. These results were influenced by the offspring's age and were mediated by parental psychosocial functioning, and to a lesser degree, by offspring psychopathology. These findings emphasize the need to routinely assess family functioning in addition to psychopathology and provide appropriate interventions to both parents and offspring.

Keywords

bipolar disorder; family functioning; family conflict; longitudinal study

Introduction:

Bipolar Disorder (BD) is a recurrent illness that affects 1–3% of youth and is associated with significant negative psychosocial consequences and increased risk for legal problems, substance abuse, and suicidal behaviors[1,2]. The family environment plays a critical role throughout development—both as a risk and protective factor [3], and family distress can both exacerbate and result from BD symptoms[4]. The study of family functioning in youth at high familial risk for BD is crucial to inform assessment and preventive interventions for these populations[5].

To our knowledge, there are 16 studies in youth with BD and 6 studies in youth with BD-parents; most are cross-sectional and assess family functioning from the perspective of *either* the parent or the offspring. The studies that focused on families of youth with BD have

mostly found higher levels of conflict and expressed emotion (EE: critical, hostile, or emotionally over-involved attitudes) and lower cohesion (emotional bonding) and adaptability (the family's ability to modify its structure, relationships and rules in response to circumstances) when compared to HC [6,7]. However, extant studies have not found differences in family functioning between youth with BD and youth with non-BD psychopathology (e.g., major depression or behavioral disorders) [8], raising the question of whether families of youth with BD are characterized by distinct patterns of family impairment, or whether such impairment is associated with psychopathology more generally.

To date, only 3 studies have evaluated family functioning longitudinally in BD youth [9–11]. These studies showed poorer mood outcome over 2 years among youth whose families reported higher conflict at baseline[9,11]. BD youth in families with high levels of EE demonstrated greater mood improvement in Family Focused Therapy (FFT) than those with high levels of EE who received a comparison intervention [10]. In one of these studies, cohesion, adaptability and conflict were significantly correlated with depression scores among BD adolescents[11].

Six cross-sectional studies focus on the family functioning of BD parents (see Table S1, available online). Most report higher conflict and lower cohesion in families with a BD parent, particularly when the offspring also had psychopathology [12]. No studies compare the family functioning of parents with BD to parents with non-BD psychopathology.

Research on family functioning in adults with BD indicates that: worse family functioning is associated with more past suicide attempts; [13] manic episodes are temporally associated with poorer family functioning than depressive episodes; [14] and improvement in mood symptoms is correlated with better family functioning [15]. In sum, longitudinal studies in adults show that family functioning is associated with clinical course, predicting both severity and relapse risk.[16–18]

Limitations in the studies conducted to date include that they were largely cross-sectional and included small samples; did not always include control groups, or only included control groups of HC subjects. Few evaluated the ratings of both parents and youth regarding family functioning, and did not always consider the effects of confounding variables (e.g. parents' psychopathology, socio-economic status). Finally, longitudinal studies were of brief duration, in the context of treatment studies, and rarely blind to child and parental diagnosis.

The Pittsburgh Bipolar Offspring Study (BIOS) is an ongoing longitudinal study, currently in its 17th year, of offspring of parents with BD (n=388) and community controls (n=250). Our prior publications show that offspring of parents with BP are at high risk to develop unipolar depression, anxiety disorders, behavior problems, suicidal ideation, substance abuse and early-onset BD spectrum disorders[2,19]. The goal of the current study is to longitudinally compare family functioning among the offspring of parents with BD, offspring of parents with non-BD psychopathology and offspring of HC parents. All measures are assessed separately from the perspective of both offspring and parent.

First, we hypothesized (*Hypothesis 1*) that families of parents with BD, particularly those in which the offspring have psychopathology, will show higher conflict, lower cohesion and lower adaptability than HC parents. Because we believe that these family functioning indices reflect global familial impairment associated with parental psychopathology, we expect that (*Hypothesis 2*) families with a parent with BD and families with a parent with non-BD psychopathology will both have impaired family functioning compared to the healthy control group, however they will not differ from one another. Third (*Hypothesis 3*), we hypothesized that psychosocial functioning and presence of psychopathology in both offspring and parents will predict family functioning. Finally, given that epidemiological studies indicate family conflict tends to increase and family cohesion decrease throughout adolescent development[20,21], we hypothesize that (*Hypothesis 4*) levels of these variables will change over follow-up.

Method:

The methods employed in BIOS are described in detail in prior publications [2]. Briefly, BIOS recruited 481 offspring of 256 parents with Diagnostic and Statistical Manual, Version-IV (DSM-IV) BDI or BDII and 337 offspring of 170 community control parents. For the present analyses, we examined two subgroups of the control group: 1. offspring (n=162) of parents (n=82) with non-BD psychopathology, 2. Offspring (n=175) of psychiatrically healthy parents (n=88) (HC). Offspring enrolled between ages 7–18 years were included in these analyses. Subjects were assessed every 2.1 years on average and had a median of 3.0 assessments with 4.3 years of follow-up. The overall retention rate for the study through the last follow-up assessment included in these analyses is 94%. Parents with BD were recruited through advertisements (53%), adult BD research studies (31%), and outpatient clinics (16%). Control parents were ascertained by random-digit dialing and were group matched for age, sex and neighborhood to the parents with BD.

Parents and offspring consented for their participation. Exclusion criteria for parents included current or lifetime diagnoses of schizophrenia or intellectual disability; mood disorders secondary to substance abuse, medical conditions that interfered with study participation; and living more than 200 miles from Pittsburgh. Exclusion criteria for the control group were the same, with the additional criterion that neither biological parent had BD or a first-degree relative with BD. All offspring of each eligible parent between the ages 7–18 were included unless they were deemed unable to complete the assessments (e.g., intellectual disability).

Instruments:

Parents and participating biological co-parents (34%) were assessed by direct interview using the Structured Clinical Interview for DSM-IV[22]. The psychiatric history of non-participating co-parents was obtained from the participating parent using the Family-History Research Diagnostic Criteria[23].

To establish the child's diagnosis at baseline and follow-up visits, parents and offspring were interviewed using the Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version (K-SADS P/L) for non-mood disorders and the K-

SADS Mania Rating Scale and the depression items from the KSADS-Present Version, which assess symptoms during the worst week over the past month [24,25]. K-SADS symptom ratings and diagnoses were based on consensus ratings incorporating all available data. Assessments were conducted by trained interviewers, and reviewed by a child psychiatrist. Interviewers and psychiatrists were blind to parental diagnoses.

The κ statistic for inter-rater reliability, conducted by having all raters review and independently rate audio-recorded interviews, was 0.86 for BD-spectrum disorders (presence/absence of any BD spectrum disorder), 0.77 for BD-I/II vs. BD not otherwise specified vs. no BD, 0.64 for major depressive episode, 0.71 for any depressive episode, 0.86 for attention-deficit hyperactivity disorder, 0.78 for anxiety disorders, 0.84 for oppositional defiant disorder and/or conduct disorder, and 1.0 for substance use disorders.

Parents and offspring completed self- and parent-report scales of psychopathology and functioning at each follow-up assessment. Socioeconomic status was determined using the Hollingshead scale [26]. We used the Children's Global Assessment Scale (CGAS) as a basic quantification of functioning at home and school for offspring and the Global Assessment of Functioning (GAF) to rate parental psychosocial functioning [27,28].

Family functioning was evaluated using the Conflict Behavior Questionnaire (CBQ)[29] and the Family Adaptability and Cohesion Scale (FACES II)[30]. These instruments have been widely used and are reliable and valid[29,31].

The Conflict Behavior Questionnaire (CBQ)[29] assesses perceived parent-child communication and conflict, and was completed by parents (about their child) and offspring (separate reports about mother and father). The questionnaire contains 20 true/false statements. Some statements cover the respondent's appraisal of their relative's behavior [e.g. "My teenager acts impatient when I talk," (rated by the parent) "My mother is bossy when we talk" (rated by the child)]; some cover the respondent's perception of interactions with their relative (e.g. "We argue a lot about rules"). Items are summed to generate a total conflict score (range: 0–20; higher scores indicate more negative communication).

The Family Adaptability and Cohesion Evaluation Scale II (FACES-II)[30] was completed by parents and offspring older than 7. It includes 30 statements rated on a scale of 1 (almost never) to 5 (almost always). The scale yields 2 subscale scores: 1. Cohesion:-Defined as emotional bonding among family members. It includes variables such as internal boundaries, coalitions, time, space, friends, interests and recreation, and ranges from 15 (more disengaged) to 80 (more connected). Sample items include: "Family members are supportive of each other during difficult times"; "Family members know each other's close friends". 2. Adaptability: Defined as the ability of the family system to change its structure, role relationships, and rules in response to situational and developmental needs [32]. The adaptability score ranges from 15 (rigid family patterns) to 70 (flexible family patterns). Sample items include: "Children have a say in their discipline"; "When problems arise, we compromise". Higher scores on both cohesion and adaptability represent less impairment in family functioning[30].

Statistical Methods

Baseline between-group comparisons of demographic, clinical, and family history variables were made via ANOVA, chi-square tests, and Kruskal-Wallis nonparametric tests as appropriate. The primary outcome measures modeled were the FACES-II cohesion and adaptability scores (child and parent reports) and the CBQ total score (parent-report and child-report about mother and father) as measured repeatedly before the offspring reached age 18. Multilevel multivariate linear regression was used to model the intercorrelated FACES-II outcomes and account for within-subject and within-family clustering across repeated measurements. Specifically, factors that varied at the subject-level such as age at assessment and presence of both biological parents in household were modeled at the first level, whereas factors that varied at the family-level such as parental diagnostic grouping and socioeconomic status were modeled at the second level. Because CBQ total scores were severely right-skewed (most scores were zero or quite low) and nonremediable by mathematical transformation, gamma regression (employing a natural logarithm link function after +1 transformation) was used to compare groups on CBQ scores with calculation of robust standard errors (i.e., generalized estimating equations) since attempts to fit generalized linear mixed regressions failed to converge.

The independent variable in each model was the trichotomous parent grouping variable “BD parent vs. parent with non-BD psychopathology vs. healthy parent.” All models controlled for age to account for an observed gradual degradation in family functioning as subjects aged. Models further controlled for demographic factors on which groups significantly differed at the 0.1 level (e.g., socioeconomic status and presence of both biological parents in household; see Results). Lastly, models controlled for offspring psychopathology using the trichotomous grouping variable (BD vs. non-BD psychopathology vs. healthy). Monte Carlo simulation indicated that given the sample size and covariates in the above models, group contrasts with Cohen’s d = 0.21 (small effect) or larger could be detected with 80+% power.

Models were also fit testing interactions between the parent and offspring psychopathology effects, but the interactive effects were nonsignificant. All pairwise comparisons implemented a Tukey-Kramer adjustment to account for multiple comparisons. As a final stage of the analysis, a repeated measures path analysis using a generalized estimating equations scheme was fit to ascertain the extent to which repeatedly assessed offspring psychopathology (any Axis-I disorder vs. none), offspring functioning (measured by CGAS), and parent functioning (measured by GAF) mediated the effects of parent diagnostic grouping on the FACES-II and CBQ family functioning scores over time. To ensure that the temporal precedence assumption of statistical mediation held, mediator data were used to predict family functioning outcomes at the next assessment (median of 2.1 years later). All submodels covaried for age at the time of the FACES-II/CBQ assessment (group-by-age interactions and quadratic effects were tested but found to be nonsignificant).

Multilevel regression and mediation path models were fit using Mplus 5 (code archived in Figure S1, available online); all other analyses were performed using SAS 9.4.

Results:

The offspring of BD parents and the offspring of parents with non-BD psychopathology did not significantly differ on any demographic factors (Table 1). The offspring of HCs had significantly higher mean SES and were more likely to live with both biological parents than both the offspring of BD and non-BD psychopathology. Mothers' ages at offspring birth were also older in the HC group. Offspring with BD parents had significantly higher rates of BD spectrum, depressive, and anxiety disorders than both the offspring of parents with non-BD psychopathology and HC, and significantly higher rates of ADHD and DBD than HC at baseline. The offspring of parents with non-BD psychopathology also had significantly higher rates of depressive and anxiety disorders, ADHD, and DBD than HC. With the exception of substance abuse, the offspring of BD parents showed significantly higher rates of all parental psychiatric disorders than the offspring of parents with non-BD psychopathology. There were no-between offspring group differences in those who had one parent vs. two parents with psychopathology. Offspring who did not have longitudinal data (n= 45) had significantly lower SES and younger age of mother and father at time of birth, they were less likely to be white or live with both biological parents, and they were more likely to have a depression (p-values < 0.02). The parental groups did not significantly differ in likelihood of having follow-up data or in number of follow-up assessments.

Longitudinal Analyses

FACES-II: Overall, as expected in hypothesis 4, average FACES-II cohesion scores (Figure 1a) across all groups declined substantially as subjects aged (ps<0.0001), while FACES-II adaptability scores remained fairly constant (the remaining longitudinal plots of cohesion, adaptability and conflict are depicted in Figure S2, available online). Intercept-only mixed linear regressions of difference-scores between parent and child FACES-II indicated that parents reported significantly higher FACES-II cohesion and adaptability than did the children (both ps<0.0001).

Within-subject-assessment correlation between follow-up FACES-II scores reported by the same respondent was quite high (Spearman r = 0.67–0.69), and correlation between scores reported by different respondents, but measuring the same domain (i.e., cohesion or adaptability), was moderately high (Spearman r = 0.36–0.53). For those reasons, multilevel multivariate linear regression was used to model the intercorrelated FACES-II outcomes and account for within-subject and within-family clustering across repeated measurements. As estimated in hypotheses 1 and 2, both parental groups of BD and non-BD psychopathology did not significantly differ from one another on any FACES-II score (ps>0.2), but had significantly lower mean cohesion and adaptability scores than HC across both child and parent reports (ps<0.02; Table 2).

CBQ: Across all groups, as predicted in hypothesis 4, conflict levels increased substantially as subjects aged (ps<0.0001) (Figure 1b). Intercept-only mixed linear regressions of differences between parent and child CBQ scores indicated that parents' ratings of conflict were significantly more severe than offspring's (ps<0.0001).

Correlation between follow-up CBQ scores as reported by different respondents was relatively low (Spearman r = 0.24–0.43). Consistent with hypothesis 2, the regression indicated that across all subscales, parents with BD and non-BD psychopathology did not significantly differ from one another but had significantly higher CBQ scores than HC parents (ps<0.02; Table 2).

Mediational Path Analysis

The general design of the mediation path analysis for the FACES-II cohesion child-report submodel is shown in Figure 2 (the six remaining submodel diagrams for cohesion, adaptability and conflict are depicted in Figure S3, available online). Below, we report a summary of findings from the mediation model; more rigorous statistical interpretations of this model are included in the supplementary material (see Supplement 1, available online).

The BD parent group did not significantly *directly* differ from the non-BD psychopathology parent group in any FACES-II or CBQ measures (as was the case in the previous models). Parent's psychopathology significantly predicted the mediator effects of offspring psychopathology and parent GAF (ps<0.001). Offspring CGAS did not significantly mediate the parent diagnostic grouping effect; thus, this effect was removed from the model. Consistent with hypothesis 3, results showed that parent GAF scores significantly mediated the parent diagnostic grouping effects on all FACES-II and CBQ outcomes, and offspring psychopathology significantly mediated the parent diagnostic grouping effects on all CBQ and child-reported FACES-II outcomes (ps<0.03) (see Table S2, available online). Overall, the BD parent total effects (direct effects + mediated effects) were larger than the non-BD psychopathology parent total effects in all seven submodels (see Figure 2 and Figure S3, available online). However, this contrast was only significant in the CBQ parent summary score submodel. The full mediation model had a root mean square error of approximation (RMSEA) of 0.019, comparative fit index (CFI) of 0.997, and Tucker-Lewis index (TLI) of 0.982, indicating good model fit (see Supplement 1, available online, for more information on goodness of fit).

Discussion:

This longitudinal study examined family functioning in the families of children with at least one parent with BD. To our knowledge, this is the largest prospective high-risk offspring study to evaluate the family functioning of parents with BD in comparison to parents with non-BD psychopathology and HC parents. As hypothesized, after adjusting for the offspring's level of psychopathology, families with BD parents and families of parents with non-BD psychopathology showed significantly lower levels of cohesion and adaptability and higher conflict in comparison with HC families. However, there were no significant differences in family functioning between families of BD parents and families of parents with non-BD psychopathology. Poorer family functioning was directly accounted for by the effects of parental psychopathology, and was also mediated by parental psychosocial functioning and offspring psychopathology. Finally, we found that in all three groups, family cohesion levels gradually decreased, and conflict levels increased from childhood into adolescence, as reported by both offspring and parents.

The following study limitations should be taken into account. First, ratings of family functioning are from parents and offspring with psychopathology, and therefore may be biased [33]. Thus, standardized laboratory-based family interaction tasks of family functioning (e.g., McMaster Clinical Rating Scale) could minimize the potential for bias. Second, the results may not be generalizable to a more culturally diverse sample because our sample was mainly Caucasian. Third, though this is a prospective study, all diagnoses and estimates of age of onset are made retrospectively for the interval of time between assessments. Finally, given that BIOS is a naturalistic study in which the effects of treatment are confounded by indication, treatment was not included in the analyses.

Consistent with other studies, we found lower cohesion and adaptability and higher conflict in families of BD parents compared to HC [3,12]. However, our results indicate that these differences are not specific to families with a BD parent because they were similar in families of parents with non-BD psychopathology. Similar to other studies, the correlations between parents' and youths' ratings on the CBQ and FACES-II were low to moderate, emphasizing the need for a thorough evaluation process that captures the different perspectives of youth and their parents [6,34].

Prior studies that focused on BD youth instead of BD parents have not found differences in family functioning between the families of BD youth and youth with non-BD psychopathology, again supporting the idea that family dysfunction is related to psychopathology in general rather than BD specifically [8,35].

The relationship between family functioning, psychopathology and psychosocial functioning are multidirectional and likely serve as both cause and consequence for one another[36]. Poor family functioning might lead to a "vicious cycle" of new onset or worsening of psychopathology, increased stress, and difficulties in coping with stress[37], which further contributes to worsening of family functioning. We found that family functioning is directly affected by parental psychopathology, and is also mediated by parental psychosocial functioning and offspring's psychopathology. According to our path analysis, the effect of child's psychopathology on family functioning is significant but is smaller than the effect of parental psychopathology. These findings underscore the substantial impact that parental psychopathology has on family functioning above and beyond the offspring's psychopathology. In fact, studies show that treatment for parents, even in the absence of treatment for offspring, may help ameliorate the offspring's psychiatric symptoms [38]. In our path-analysis model, the total effect of BD parents on familial functioning was larger than parents with non-BD psychopathology (figure 2), though this contrast was only significant in the parent CBQ sub-model. This might be explained by the fact that this model treats offspring diagnosis as a mediator dependent on parent diagnosis rather than a simple covariate. In doing so, the model accounts for the fact that parental BD leads to more offspring psychopathology than parental non-BD psychopathology, which eventually leads to more family dysfunction. Our meditational path analysis demonstrates for the first time in the literature the complex interplay between family functioning, parental psychopathology, parental psychosocial functioning, and offspring psychopathology. Hence, outcomes at the individual youth, parent and family levels may be positively impacted when clinicians assess and target these variables in treatment.

We found higher levels of conflict as reported by parents compared to their offspring in all three study groups. These results extend the findings of prior uncontrolled investigations among BD youth [6,35,39]. A review paper that focused on parent-adolescent relationships suggested that daily conflicts are more distressing to parents than to adolescents [40]. Also, parents may give greater meaning to conflictual interactions, interpreting them as rejections of their values or indicators of their failures as parents. In contrast, adolescents may see the conflicts as less significant [40]. Thus, differences in perspective between youth and their parents regarding conflicts should be considered for both assessment and treatment purposes.

We found an age-related pattern, whereby family cohesion decreases, and conflict levels increase between ages 7–18 in all three parental groups. Interestingly, family adaptability tended to be constant over time, possibly indicating a trait-like index. To our knowledge, this is the first study to demonstrate that families with a parent (and in a proportion of cases, an offspring) with a psychiatric diagnosis show the same longitudinal patterns of family functioning and conflicts as healthy families, although with higher levels of conflict and lower cohesion and adaptability. These patterns are consistent with the literature on familial dynamics in the general population. Longitudinal studies of normative youth show a steady increase in family conflict between ages 14 to 18, during which there is an increase in adolescent autonomy and a decline in parent-child cohesion [20,21]. The increase in conflicts and decrease in cohesion during the adolescent years is thought to be part of the normal maturation process that includes aspiration for independence, de-idealization of parents, and a shift of social orientation away from parents [41].

In summary, any type of parental psychopathology predicted family impairment. These results were influenced by the offspring's age and were mediated by parental psychosocial functioning, and to a lesser degree, by offspring psychopathology. For the first time in the literature, our analysis showed that BD offspring, offspring of non-BD psychopathology parents and offspring of healthy parents have a similar age-related pattern in which family cohesion decreases and conflicts increase from age 7 to 18 years old. Thus, it is important to routinely assess family functioning in addition to individual psychopathology. This assessment should consider the developmental stage of the youth and the fact that family dynamics change over time. These factors are central for identifying and providing appropriate interventions to both parents and offspring.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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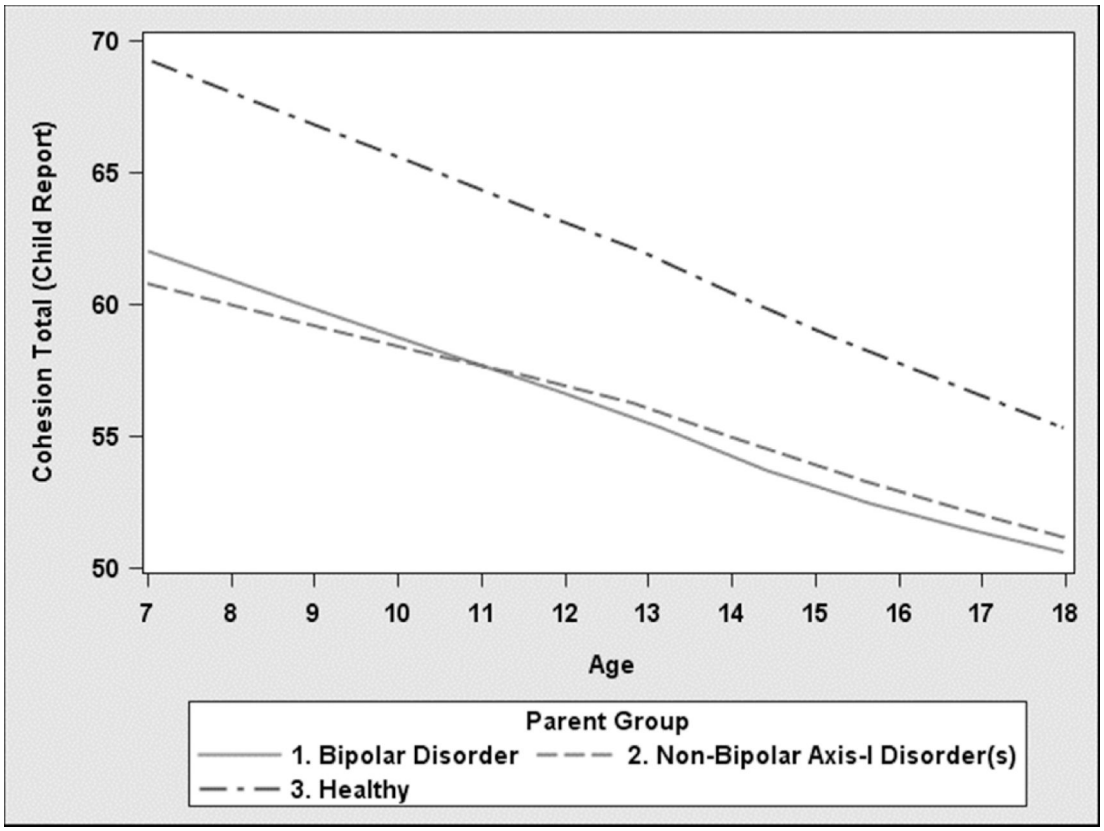

Figure 1a.
Longitudinal Course of Cohesion, Child report

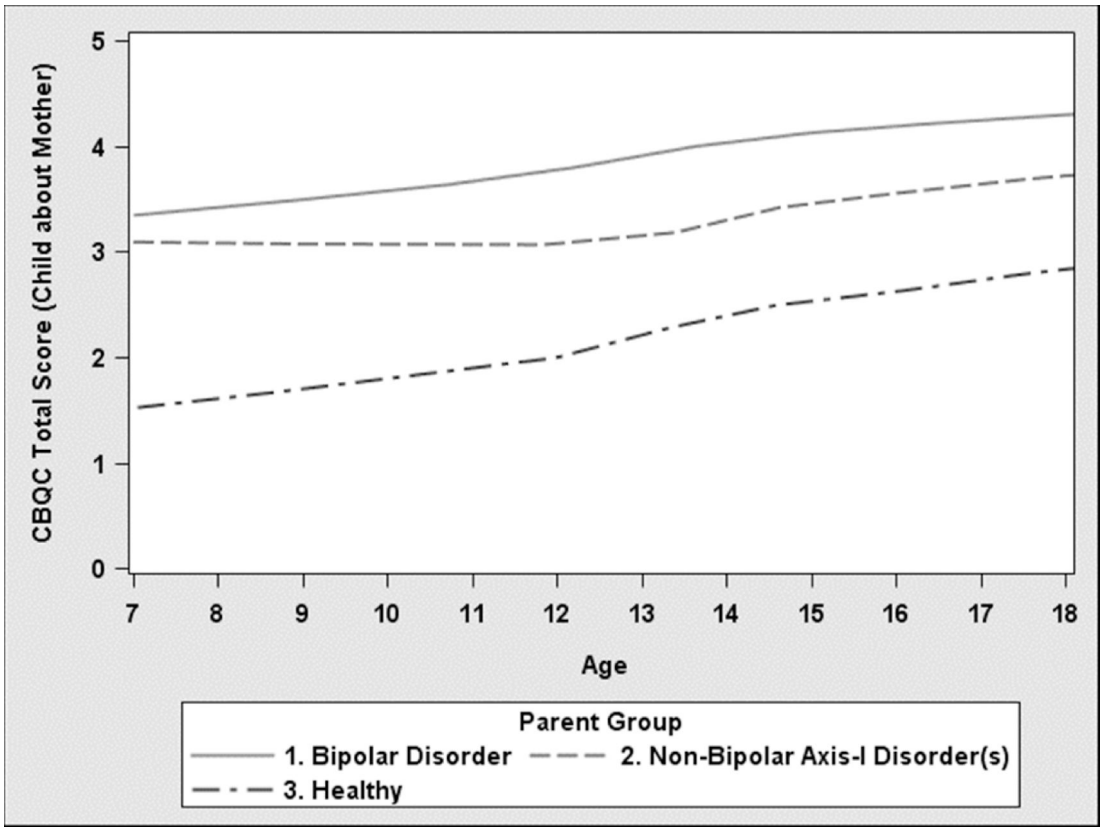

Figure 1b.
Longitudinal Course of Conflict, Child Report About Mother

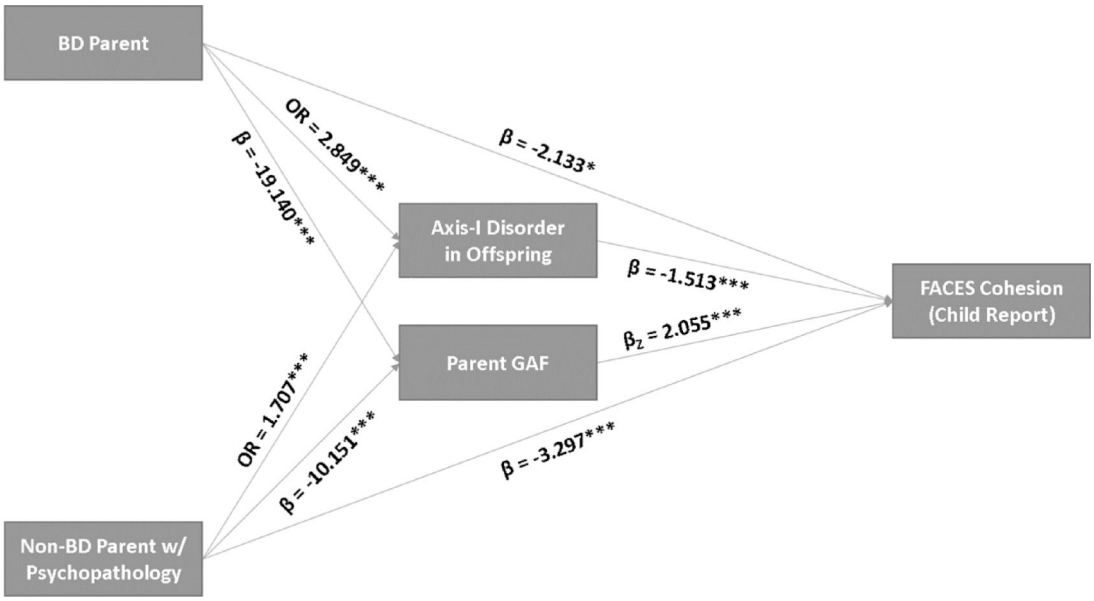

Figure 2. Mediational Path Analysis

Note: β = regression coefficient for categorical predictor; β_Z = standardized regression coefficient for continuous predictor; BD = bipolar disorder; FACES = Family Adaptability and Cohesion Scale-II; GAF = Global Assessment of Functioning; OR = odds ratio

Table 1.

Demographic and Clinical Factors

	Offspring of bipolar Parents (*n*=481)		Offspring of Parents w/ Nonbipolar Psychopathology (*n*=162)		Offspring of Healthy Parents (*n*=175)		Test Statistics	
Demographics	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Stat**	***p***
Intake Age	15.4	2.6	15.5	2.4	15.5	2.2	K-W χ^2=1.66	0.4
Hollingshead Socioeconomic Status	34.1[1]	14.0	33.5[1]	12.3	42.2[2]	13.9	K-W χ^2=48.49	<0.0001
Mother's Age at Offspring's Birth	27.2[1]	5.9	28.3[1,2]	6.2	29.2[2]	5.3	F=8.31	0.0003
Father's Age at Offspring's Birth	30.1	7.2	30.4	7.7	31.2	6.8	F=1.56	0.2
Number of Offspring in Family	1.9	1.0	2.0	1.0	2.0	0.8	Poisson χ^2=1.24	0.5
	N	**%**	**N**	**%**	**N**	**%**	**χ^2 Stat**	***p***
Race (white)	390	81.1	119	73.5	135	77.1	4.54	0.1033
Sex (male)	243	50.5	79	48.8	84	48.0	0.39	0.8242
Living with Both Biological Parents	233[1]	48.4	921	56.8	132[2]	75.4	37.97	<0.0001
Offspring Diagnoses	**N**	**%**	**N**	**%**	**N**	**%**	**χ^2 Stat**	***p***
Any Bipolar Spectrum Disorder	76[1]	16.5	3[2]	2.0	1[2]	0.6	48.02	<0.0001
Any Non-Bipolar Axis-I Disorder	319[1]	69.2	87[2]	56.9	54[3]	32.1	70.10	<0.0001
Any Depression	167[1]	36.2	39[2]	25.5	19[3]	11.3	38.30	<0.0001
Any Anxiety	174[1]	37.7	40[2]	26.1	23[3]	13.7	35.29	<0.0001
ADHD	153[1]	33.2	37[1]	24.2	22[2]	13.1	25.98	<0.0001
Disruptive Behavior Disorder	130[1]	28.2	34[1]	22.2	15[2]	8.9	25.95	<0.0001
Psychotic Disorder	4	0.9	3	2.0	0	0	Fisher's Exact	0.2
Substance Use Disorder	39	8.5	13	8.5	7	4.2	3.50	0.2
Parent Diagnoses	**N**	**%**	**N**	**%**	**N**	**%**	**χ^2**	**p-value**
Any Anxiety	366	76.1	95	58.6	---	---	18.18	<0.0001
ADHD	120	25.0	13	8.0	---	---	21.16	<0.0001
Disruptive Behavior Disorder	181	37.6	19	11.7	---	---	37.94	<0.0001
Psychotic Disorder	96	20.0	4	2.5	---	---	28.22	<0.0001
Substance Use Disorder	303	63.0	96	59.3	---	---	0.72	0.4
Both Parents Any Axis-I Disorder	225	46.8	61	37.7	---	---	124.12	<0.0001

Note: Values with differing superscripts indicate that groups significantly differ after adjustment for multiple comparisons. ADHD = attention-deficit/hyperactivity disorder.

Table 2.

Longitudinal Family Functioning and Conflict Models

Multilevel Multivariate Linear Model	**Least Square Means (SE)**			**Group Contrast**	**Cohen's d**	**Z**	***p***
FACES Subscales	**1. Offspring of bipolar Parents (n=481)**	**2. Offspring of Parents w/ Non-bipolar Psychopathology (n=162)**	**3. Offspring of Healthy Parents (n=175)**				
Cohesion Child Report	54.9 (0.5)[a]	55.6 (1.0)[a]	60.0 (0.8)[b]	1 vs. 3	0.46	5.46	**<0.0001**
				2 vs. 3	0.39	3.65	**0.0001**
Adaptability Child Report	43.0 (0.4)[a]	42.8 (0.7)[a]	45.4 (0.5)[b]	1 vs. 3	0.28	3.81	**0.0001**
				2 vs. 3	0.31	3.09	**0.001**
Cohesion Parent Report	56.1 (0.7)[a]	57.0 (1.0)[a]	62.3 (0.8)[b]	1 vs. 3	0.60	6.20	**<0.0001**
				2 vs. 3	0.57	4.48	**<0.0001**
Adaptability Parent Report	43.8 (0.5)[a]	44.2 (0.7)[a]	46.2 (0.6)[b]	1 vs. 3	0.34	3.14	**0.0008**
				2 vs. 3	0.33	2.29	**0.01**
Generalized Estimating Equations	**Least Square Means (SE)**			**Group Contrast**	**Cohen's d**	**Z**	***p***
CBQ Subscales	**1. Offspring of bipolar Parents (n=481)**	**2. Offspring of Parents w/ Non-bipolar Psychopathology (n=162)**	**3. Offspring of Healthy Parents (n=175)**				
Total Score Child about Mother	3.8 (1.0)[a]	3.8 (1.1)[a]	2.6 (1.1)[b]	1 vs. 3	0.29	4.05	**<0.0001**
				2 vs. 3	0.32	3.46	**0.0003**
Total Score Child about Father	4.5 (1.1)[a]	4.7 (1.1)[a]	3.5 (1.1)[b]	1 vs. 3	0.20	2.49	**0.006**
				2 vs. 3	0.26	2.29	**0.01**
Total Score Parent Summary	6.5 (1.0)[a]	5.7 (1.1)[a]	3.8 (1.1)[b]	1 vs. 3	0.51	6.45	**<0.0001**
				2 vs. 3	0.44	4.44	**<0.0001**

Note: Values with differing superscripts (a or b) indicate that groups significantly differ after adjustment for multiple comparisons. Models covaried for age at assessment, presence vs. absence of both biological parents in household, age of mother at time of offspring birth, offspring diagnostic grouping (bipolar disorder (BD) vs. non-BD psychopathology vs. healthy), and socioeconomic status. CBQ = Conflict Behavior Questionnaire; FACES = Family Adaptability and Cohesion Scale-II.; SE = standard error..