An Investigation of Psychosocial Functioning for Children and Adolescents Diagnosed with Bipolar Disorders

Maura Paczan

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AN INVESTIGATION OF PSYCHOSOCIAL FUNCTIONING FOR CHILDREN AND ADOLESCENTS DIAGNOSED WITH BIPOLAR DISORDERS

by

Maura L. Paczan, M.S.Ed.

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Presented by:

Maura L. Paczan

B.A. Psychology/Deaf Studies, University of Pittsburgh, 1996
M.S.Ed. Child Psychology, Duquesne University, 1999
Certification, Certified School Psychologist, Duquesne University, 2001

May 26, 2006

AN INVESTIGATION OF PSYCHOSOCIAL FUNCTIONING FOR CHILDREN AND
ADOLESCENTS DIAGNOSED WITH BIPOLAR DISORDERS

Approved by:

Tammy L. Hughes, Ph.D.
Assistant Professor of School Psychology
Department of Counseling, Psychology & Special Education
Duquesne University

Jeffrey A. Miller, Ph.D., ABPP
Associate Professor of School Psychology
Department of Counseling, Psychology & Special Education
Duquesne University

Boris Birmaher, M.D.
Professor of Psychiatry
University of Pittsburgh School of Medicine
University of Pittsburgh

Program Director
Jeffrey A. Miller, Ph.D., ABPP
School Psychology Program
Abstract

This study provides a literature review of how the various sub-types of bipolar disorders are related to a child’s daily functioning. Also, this study examined the age of onset of the disorder as it is related to psychosocial functioning. Specifically, age of onset was compared with psychosocial functioning in the areas of friends, family and school. Further, the interaction between age of onset, type of bipolar disorder (I, II, NOS), and psychosocial functioning was examined. The results confirmed, youth diagnosed with Bipolar Disorder evidence significant difficulty in overall psychosocial functioning. This finding was consistent across measures (i.e., CGAS & GSA ALIFE). Implications of the Age of Onset and diagnosis of Bipolar Disorder (I, II, NOS) on a youth’s psychosocial functioning were examined and discussed.
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CHAPTER I

INTRODUCTION

Bipolar Disorder and Psychosocial Functioning

Bipolar Disorder (BPD) is not well understood in children. The American Academy of Child and Adolescent Psychiatry (2002) reports that up to one third of the 3.4 million children with depression in the United States may actually be suffering from the onset of BPD (Wilkinson, Taylor, & Holt, 2002). Because childhood BPD does not fit well the symptom criteria established for adults, and the symptoms can resemble and/or co-occur with other common childhood-onset mental disorders, caution should be used when diagnosing children with BPD. However, understanding childhood BPD is essential because there are substantial numbers of adults with BPD who date the onset of their disorder to childhood or adolescence (Birmaher, 2004; Biederman, 2003; Carlson, Bromet, Driessens, Mojtabai, & Schwartz, 2002; Geller & Luby, 1997; Lewinsohn, Klein, & Seeley, 1995; Lofthouse & Fristad, 2004; Paplos & Paplos, 2002; Wozniak, Biederman, & Richards, 2001).
Further, regardless of the diagnostic difficulties, when BPD is found in children, they exhibit significant impairments in functioning with peers, and at home with family and in school (Birmaher, 2004; Carlson et al., 2002; Geller, Bolhofner, Craney, Williams, DelBello, & Gundersen, 2000; Lewinsohn, et al., 1995).

This study examines how the various sub-types of bipolar disorders are related to a child’s daily functioning. Also, this study examines age of onset of the disorder as it is related to psychosocial functioning. Specifically, age of onset will be compared with psychosocial functioning in the areas of friends, family and school. Further, the interaction between age of onset, type of bipolar disorder (I, II, NOS), and psychosocial functioning will be examined. Because the symptoms of other mental health disorders (Disruptive Disorders, ADHD, Anxiety Disorders) can also affect psychosocial functioning, and the definition of bipolar disorder in children can include overlapping symptoms found in these other mental disorders, this study will examine the effects of BPD on psychosocial functioning when other disorders are present in children and adolescents.
BPD Classification

There are three different categories of bipolar disorder, bipolar I (BPD I), bipolar II (BPD II), and bipolar disorder not otherwise specified (BPD NOS), as described in the fourth edition of the Diagnostic Statistical Manual of Mental Disorders, Text Revised (APA, 2000). In general, BPD is a mood disorder characterized by dramatic mood swings, from overly high (elation) to very low (sad and hopeless) and cycling back again, often with a period of normal mood between mood changes (National Institute of Mental Health; NIMH, 2000b). High periods are termed episodes of mania and low periods are termed depression. To meet diagnostic criteria for BPD I, the individual must have experienced recurrent episodes of mania and major depression. BPD II, is diagnosed when an individual experiences milder episodes of mania, termed hypomania that alternate with periods of depression (NIMH, 2000b). BPD NOS includes symptoms of mania or depression that do not meet threshold criteria for BPD I or BPD II, yet result in a significant impairment in daily functioning. The DSM IV-TR defines BPD in terms of discrete episodes of manic or depressive symptoms for both youth and adults. However, researchers examining children and
adolescents report somewhat different symptoms than those experienced by adults (Biederman, Mick, Faraone, Spencer, Wilens, & Wozniak, 2000; Birmaher, 2004; Carlson, 1999; Carlson et al., 2002; Geller, Tillman, Craney, & Bolhofner, 2004; Lewinsohn, Seely, Buckley, & Klein, 2002). It is reported that children show aggression, irritability, destructiveness, impulsivity, and rapid mood changes (Geller et al., 2000). They often do not show clear distinctive episodes that follow a good premorbid adjustment, functional impairments are also different, and they often have pronounced emotional lability (Lewinsohn et al., 2002). In general, children experience multiple episodes of depression and mania over their lifetime, and some have rapid cycling, where they move between symptoms of mania and depression during the same week or day (Birmaher, 2004). A child’s complicated symptom presentation challenges the usefulness of the current definition of BPD in the DSM.

In 2000, a taskforce at the National Institute of Mental Health (NIMH) examined the problem of diagnosing BPD in children according to the DSM IV criteria. They describe children falling into two categories: 1) those who clearly have BPD I (reoccurring discrete episodes of mania and
depression) and 2) those who may manifest bipolar symptoms but do not completely fit the adult phenotype defined in DSM IV (NIMH, 2000a). Also, the NIMH roundtable agreed on the following criteria for the diagnosis of BPD NOS in children and adolescents. Children with BPD NOS do not need to evidence the classic symptoms of mania, hypomania, or BPD I or II subtypes; rather they evidence BPD symptoms that are related to functional impairments (NIMH, 2000a). The current study will define BPD I, BPD II according to the DSM IV criteria and BPD NOS will be defined with reference to the NIMH recommendations. Definitions are reported in the on-going longitudinal study Course and Outcome for Bipolar Disorders and Youth (COBY). The COBY study provided the data used in the analyses of the current study.
Effects of BPD on Children

Not only are children’s BPD symptoms different than adults, a child’s emotions, relationships, and cognitions are emerging. Thus, the process of development influences how symptoms manifest. Also, it is difficult to differentiate and/or recognize the typical variations in developmental sequences versus the emerging, overlapping or comorbid symptoms of other disorders (Biederman, Kwon, Wozniak, Mick, et al., 2004; Birmaher, 2004, Carlson et al., 2002; Geller et al., 2000; Geller et al., 2004; Wozniak, Biederman, Kiely, Albon, Faraone, & Mundy, 1995; Wozniak et al., 2001).

Overcoming the difficulty of examining childhood disorders is important because a child diagnosed with any mental illness is suffering impairments in their psychosocial functioning. Yet the negative impact is not well quantified. There are empirical works examining the characteristics and treatments of BPD, but there is less attention given to the measurement of psychosocial implications.
In the child and adolescents literature there are a relatively limited number of studies that examine childhood psychosocial functioning. To date there are no known studies examining how BPD I, BPD II, and BPD NOS are related to psychosocial functioning. For this study, psychosocial functioning will be examined from two perspectives. First an overall description of functioning will be considered and second, three subgroups (i.e., family relationships, friend relationships and school functioning) will be considered independently.

The Onset of Bipolar Disorder

There are three primary reasons to consider the importance of age of onset. First, the extensive literature on childhood depression provides a substantive background where age of onset is consistently found to be an important factor that negatively affects psychosocial functioning (APA, 2000). Second, there is initial support in the literature describing BPD in adolescents for examining age of onset. Finally, there is limited prospective data documenting the psychosocial functioning for children or adolescents diagnosed with BPD.
Researchers who have studied children with depression find that the earlier the onset of the depression, the more difficulty with psychosocial functioning and the poorer the treatment prognosis (Kovacs, Feinberg, Crouse-Novak, Paulauskas & Finkelstein, 1984). Kovacs and colleagues (1984) argue that the younger the child, the more likely that he or she has difficulty personally coping with the illness and their limited experience yields a restricted ability to utilize external coping resources.

In the adolescent research authors report that the earlier the onset of BPD the poorer the functional outcome and the increase risk of relapse (Carlson et al., 2002). Lewinsohn and colleagues (1995) examined the course and outcome of BPD in adolescents, and concluded that BPD subjects had attempted suicide, evidenced poorer global functioning, and demonstrated impaired functioning at school and in social situations with family. At the two-year follow-up, Lewinsohn and colleagues (2000) found that adolescents with BPD and subsyndromal (i.e., did not meet full criteria for BPD I or BPD II) BPD symptoms both exhibited significantly greater psychosocial impairment, poorer global functioning, and were more likely to utilize mental health services. These studies are particularly
relevant to the current study because it provides evidence that BPD and subsyndromal BPD symptoms impact adolescents' psychosocial functioning. Further, this study highlights the need to clarify the functioning of the BPD NOS group. The Lewinsohn studies are limited primarily to adolescents, thus psychosocial impairments have not yet been examined in children suffering from BPD.

In fact, there are very few studies that consider childhood onset of BPD and the effects it has on a child's psychosocial functioning. There are only two studies to date conducted by Geller and colleagues (Geller et al., 2000; Geller, Craney, Bolhofner, & Nickelsburg, 2002a) that examine children with BPD and psychosocial functioning. First, in 2000 Geller and colleagues studied three groups of children: ADHD, BPD, and a control group. They found that children diagnosed with BPD reported they experienced poor maternal-warmth, and a high degree of maternal and paternal tension and hostility in the household. They also found children diagnosed with BPD had poor social skills and few peer relationships reporting little or no friends (Geller et al., 2000). Similarly, in 2002, Geller and colleagues found that the children diagnosed with BPD reported experiencing poor maternal warmth, and were more
likely to relapse, and relapse faster than adolescents after recovery. Although these are important initial findings, Geller and her colleague’s studies were limited to using the same small subject group in which they examined the children and adolescents over a four-year period. These studies did not differentiate the psychosocial impairments for the child diagnosed with BPD I, BPD II, versus BPD NOS. These studies were also limited because most of the subjects were from wealthier families. The current study proposes to improve on the initial findings of Geller’s work by increasing the sample size for more sophisticated comparisons of a more representative group and decreasing the problems associated with heterogeneous group of subjects by using the BPD classifications.

Purpose of the Study

It is important to conduct research in this area because there are many questions unanswered for children and adolescents in the BPD literature. For example, many youth do not meet symptom criteria for BPD that is reported in adults diagnosed with the disorder. For this reason, particularly at the earlier ages, most children do not meet any DSM IV threshold criteria for Bipolar Disorder. Yet
there are a substantial number of children who evidence BPD symptoms. In these cases, researchers have found that children either fit into the category of BPD NOS or are identified with subsyndromal symptoms of bipolar disorder. For example, Lewinsohn et al. 2000 found that adolescents diagnosed with BPD and subsyndromal symptoms both exhibited significantly greater impairment with psychosocial functioning and were more likely to utilize mental health services. For this reason, it is necessary to specifically examine BPD NOS and how it has an effect on a youth’s psychosocial functioning. Also, these barriers have resulted in limited research examining the different types of Bipolar Disorders (I, II, NOS) and the effects it has on psychosocial functioning. The current study seeks to clarify some of these questions.

This study is to determine if youth diagnosed with BPD NOS evidences different and/or poorer psychosocial functioning than a youth with BPD I or II. This study will first examine overall psychosocial functioning then it will examine subsets of functioning.
As stated, the subgroups of psychosocial functioning examined will be family relationships, relationships with friends, and school functioning. The Lewinsohn et al. (2000) subsyndromal BPD group will be comparable to the current study BPD NOS group due to the definition adopted by COBY that is consistent with NIMH.

Also, this study examines children with early onset, adolescents with early onset and adolescents with late onset BPD and their psychosocial functioning. This is relevant because research conducted with children diagnosed with depression shows that the earlier the onset of the illness is related to the poorer the psychosocial functioning (Kovacs et al., 1984). In addition, this study examines the interaction of age of onset and type of bipolar disorder and its relationship to psychosocial functioning.

Anxiety is often a symptom that overlaps with depression (Kovacs et al., 1984). Because BPD tends to co-occur with externalized behavior problems in general (Carslon, 1995; Carlson, 1998; Carlson & Wientraub, 1993), and specifically with ADHD (Biederman, Mick, Bostic, Prince, Daly, Wilens, et al., 1998; Biederman et al., 2004; Geller et al., 2000; Geller et al., 2002a; Geller et al.,
2004), the current study examines the contribution of ADHD, Anxiety Disorders, and Disruptive Disorders as they co-occur with BPD. Specifically, when making comparisons of BPD and psychosocial functioning, other mental health disorders will be controlled for when necessary. Although other psychiatric disorders have been identified as a possible contributor to the psychosocial difficulties in children with BPD, it is not hypothesized that they will account for all of the psychosocial difficulty, thus they are considered to be the covariates or other variables that need to be clarified.

Lastly, this study will examine the variables Age, Sex, SES, Race, and Living situation because these variables can also have a negative affect on a youth’s psychosocial functioning. Evans and colleagues (2005) report a relationship between lower socioeconomic background and living situation and the onset of mental health disorders. Also, some ethnic groups demonstrate higher rates of mental health disorders, thus this area needs to be examined further in youth (Evans et al., 2005).
Research Objectives and Hypotheses

The research objectives and hypotheses for the current study are as follows:

Hypotheses

1. Do youth diagnosed with BPD NOS, regardless of onset, evidence poorer overall psychosocial functioning than those with BPD I or BPD II?

2. Do youth diagnosed with BPD that had a childhood onset (< 12 years of age) have poorer psychosocial functioning than youth with a late onset of the disorder (> 12 years of age)?

3. Do youth diagnosed with BPD NOS, regardless of age of onset, show poorer family relationships, friend relationships, and school functioning than those with BPD I or BPD II?

4. Do youth diagnosed with BPD that had a childhood onset (< 12 years of age) have poorer family relationships, friend relationships, and school functioning than youth with diagnosed with a late onset (> 12 years of age)?

5. Is there an interaction effect between age of onset and type of BPD (I, II, NOS) for overall psychosocial functioning?
6. When controlling for ADHD, Anxiety Disorders, and Disruptive Disorders, does BPD NOS show poorer psychosocial functioning in youth than BPD I, II, regardless of age of onset?
CHAPTER II
LITERATURE REVIEW

Historical Importance and Current Context

The National Institute of Mental Health; NIMH (2002) reports over 12 million American children suffer from a diagnosable mental illness (National Institute of Mental Health; NIMH, 2002). In the United States, one in ten children and adolescents experience mental illness severe enough to cause difficulties in daily functioning at school, home, and in their overall interactions with others (Surgeon General, 2001). Mental disorders impose burdens, which reduce the quality of children’s lives, and negatively impact their productivity, relationships with family and friends, school successes, and overall psychosocial functioning later in life.

Although, there is general agreement to address child and adolescent mental illness issues (Surgeon General, 2001), there are several disorders that have not yet received adequate attention. One disorder that is not well understood in children is Bipolar Disorder (BPD).
Over the past 20 years BPD has become more prevalent in children and adolescents (Lewinsohn et al., 1995; Lewinsohn et al., 2000). Researchers have sought to clarify the potential origins and psychosocial risks, developmental course, long-term prognosis, and pervasive psychosocial impairments of BPD (Lofthouse & Fristad, 2004).

BPD is formerly known as manic-depressive illness, bipolar (bi, meaning two) indicates that mood cycles or swings between two opposite poles: mania and depression (Birmaher, 2004). For the first part of century BPD was once thought to occur only in adulthood and rarely in youth (Journal of American Academic Child and Adolescent Psychiatry; JAACAP, 1997). It was rare to diagnose children with mania symptoms of BPD. There has been a substantial amount of research effort from 1980 to the current time, to establish BPD as a disorder experienced in childhood (Lofthouse & Fristad, 2004). Only in the last decade did researchers begin to argue that BPD symptoms in children manifested differently than in adults (Glovinsky, 2002). Furthermore, even children who meet full criteria for mania look very different than adults meeting the same criteria. Adults diagnosed with BPD have clear defined episodes of alternating manic and depressive symptoms, whereas children
and adolescents often experience rapid mood swings, and at times these mood swings can reoccur within a day (NIMH, 2002). Pediatric mania tends to be more chronic and continuous rather than episodic and acute (Carlson, 1984). A child’s mood can cycle and is characterized as multiple short episodes within a day that is interspersed between those meeting DSM duration criteria. For example, within a day or even an hour, a child’s mood cycles range from symptoms of irritability to symptoms of euphoria (Birmaher, 2004; Biederman et al., 2004; Geller et al., 2000; Leibenluft, Charney, Towbin, Bhangoo, & Pine, 2003b; Wozniak et al., 2001). Often children and adolescents may experience periods of rage, irritability, and destructive tantrums instead of distinct symptoms of mood euphoria and elation (Biederman et al., 2004; Birmaher, 2004, Carlson & Wientraub, 1993; Carlson et al., 2002; Geller et al., 2000; Geller et al., 2004).

Diagnosis and Classification of BPD

BPD is a lifelong recurrent illness, similar to other chronic medical illnesses such as epilepsy, asthma, or diabetes (Birmaher, 2004). BPD is divided into 3 categories: bipolar I (BPD I), bipolar II (BPD II), and bipolar disorder not otherwise specified (BPD NOS), as
stated in the fourth edition of the Diagnostic Statistical Manual of Mental Disorders, Text Revised (APA, 2000). To meet the diagnostic criteria for BPD I, the individual must have experienced at least one or recurrent episode of mania and major depression. Diagnostic criteria for BPD II, is when an individual experiences milder episodes of mania termed hypomania that alternate with depression (NIMH, 2002). BPD NOS includes symptoms of mania or depression that do not meet threshold criteria for BPD I or BPD II, yet individuals show significant impairment in daily functioning. In 2000, The National Institute of Mental Health (2000a) roundtable convened to discuss issues of diagnosing children with BPD. They agreed that it is possible to diagnose BPD in prepubertal children according to the DSM criteria. They describe children in two categories: 1) those who clearly have BPD I (reoccurring episodes of mania and depression) or BPD II (milder episodes of hypomania that alternate with depression) and 2) those who may be manifesting bipolar symptoms but do not completely fit the adult phenotype defined in DSM IV mood disturbance, symptoms of mania and associated functional impairments (NIMH, 2000a).
The American Psychiatric Association has acknowledged that many children and teens have impaired mood disturbances but do not meet full criteria for bipolar disorder, and hence do not fit the standard classification criteria currently accepted by the American Psychiatric Association for diagnosis (NIMH, 2000a). As such, children and adolescents usually are diagnosed with BPD NOS, because they do not meet duration of the classic symptoms of mania, hypomania, or the BPD I or II subtypes (NIMH, 2000a; Lofthouse & Fristad, 2004; Evans, Foa, Gur, et al., 2005). Therefore, it was recommended by NIMH in 2000 that Bipolar Disorder NOS serve as a working diagnosis for advancing BPD research. Further children diagnosed with BPD NOS should be described carefully addressing all behaviors while attending to possible symptom overlap, to clarify BPD in children (NIMH, 2000a; Lofthouse & Fristad, 2004; Birmaher, 2004; Evans et al., 2005). Consistent with the recommended procedure by NIMH, the current study will use DSM IV criteria for BPD I, BPD II and including BPD NOS as an adequate definition for categorizing children and adolescents with Bipolar Disorder.
Overlapping Symptoms of other Disorders

The diagnosis of BPD may be complicated and confusing because children with BPD may not present with classic BPD symptoms (Biederman et al., 1998; Biederman et al., 2004; Carlson, 1998; Carlson et al., 2002; Birmaher, 2004; Geller et al., 1998; Geller et al., 2000; Lewinsohn et al., 1995; Lewinsohn et al., 2000). In the past, researchers have stated that mania was misdiagnosed because the presentation was more common to behavioral disorders such as ADHD and Conduct Disorder (Bowring & Kovacs, 1992; Biederman, 1998; Wozniak et al., 1995). Researchers have also found that children with an early onset of BPD have a comorbidity with other disorders such as, ADHD, ODD, CD, MDD, and anxiety disorders (Agnold, Costello, & Erkanli, 1999; Biederman, 1998; Biederman et al., 2004; Birmaher, 2004, Geller & Luby, 1997; Geller et al., 2000; Lewinsohn, et al., 2003; Lofthouse & Fristad, 2004; Wozniak et al., 1995).

Researchers indicate that BPD can begin years after an externalizing disorder has clearly been established (Carlson, 1998). Thus, there is evidence of concurrent comorbidity, when one disorder precedes another related disorder (Agnold et al., 1999). When symptoms overlap either manifesting sequentially or at the same time there
are clinical difficulties in distinguishing disorder from mania in children (Carlson, 1998; Geller et al., 1998; Geller et al., 2000; Biederman et al., 2004; Wozniak, Spencer, Biederman, et al., 2004). Externalizing disorders typically have an earlier onset than pediatric mania and children may experience reoccurring or symptom overlap of the two disorders. Thus, accurate symptom measurement is essential.

Although, the current study will examine children and adolescents with different types of BPD, there is a lack of literature in this area. Therefore a review of the adult literature where earlier impact of BPD is documented, and is discussed here.

**BPD in Adults**

The diagnosis of childhood-onset BPD has been controversial for years, and within the last decade it has become more recognized in adolescents and children. To begin to clarify the development of BPD, many researchers have reviewed previous studies with adults who were identified to have bipolar symptoms as a child or adolescent. As early as 1921, Krapelin observed that .4% of his patients experienced their onset of BPD before the age of 10. In the 1970’s, researchers began to report that
adults diagnosed with BPD retrospectively date the onset of their symptoms to childhood or adolescence (Carlson, Davenport, & Jamison, 1977). For example, Carlson et al. (1977) reported 1/5 of BPD patients presented symptoms before the age of 19. Although in the past BPD was considered rare, the childhood onset is now being reported more frequently (Biederman et al., 2004; Birmaher, 2004; Carlson et al., 2002; Geller et al., 2000; Geller et al., 2002a; Geller et al., 2004; Glovinsky, 2002; Lewinsohn et al., 1995; Lewinsohn et al., 2000; Lofthouse & Fristad, 2004; Wozniak et al., 2004). This is relevant because it provides evidence that many years ago BPD was prevalent and documented in children but was not recognized and diagnosed until adulthood. It is likely that children were not provided with the appropriate treatment until adulthood when symptoms clearly met threshold criteria.

**BPD in Adolescents**

It is important to note that although adolescent and childhood BPD are distinct groups, many researchers do not clearly differentiate children and adolescents in their studies. Further arbitrary cut points can be set for these groupings.
It is common practice to group adolescents starting at the age of 12. For this study the investigator will group adolescents into the age group of 12 through 17 years of age.

Adolescent onset. Carlson (1977) examined early onset bipolar disorder in adolescents and found those who evidenced mania in adolescents’ longer durations of BPD symptoms, increase number of episodes of the illness, and they had a poorer outcome. Carlson and colleagues (2002), indicated that children and adolescents with BPD were severely irritable, agitated, and dysphoric. Also, they infrequently presented with the classic manic symptoms of euphoria and grandiosity. Carlson and the authors concluded that this suggests a developmental variability in the classic expression of BPD (Carlson, 1984; Carlson & Weintraub, 1993; Carlson et al., 2002).

When Strober and colleagues (1995) conducted a 5-year naturalistic prospective follow-up study of 54 consecutive admissions of adolescents to a university inpatient service with the diagnosis of BPD I affective illness.
The investigators of this study found that the rapid ups and downs of their mood may be the defining characteristic to identify adolescents with BPD, in addition the reoccurring of their illness (Strober, Schmidt-Lackner, Freeman, Bower, Lampert, & DeAntonio, 1995).

After researchers began to formally recognize that BPD does exist in adolescents, they started to define how adolescents’ experience mania with severe irritability, affective storms that is persistent or prolonged, and aggressive temper tantrums that are often violent (Biederman et al., 2000; Biederman et al., 2004; Birmaher, 2004; Carlson, 1977; Carlson & Weintraub, 1993; Carlson, 1995; Carlson et al., 2002; Strober et al., 1995; Wozniak et al., 1995; Wozniak et al. 2001). Outbursts often include threatening or attacking behaviors towards family members, other children, adults, and teachers. Between the periods of outbursts, children may show an irritable or angry mood (Carlson, 1984; Carlson & Wientraub, 1993; Biederman, 1998; Birmaher, 2004; Geller & Luby, 1997; Paplos & Paplos, 2000).
Prevalence of BPD in adolescence. One of the most significant studies in adolescent research was conducted by Lewinsohn and his colleagues (1995), documenting that the prevalence of BPD during the adolescent years is similar with the adult population. In this epidemiological study of a representative community sample of 1,709 adolescents, 14 to 18 years old, were randomly selected from nine senior high schools, representative of urban and rural districts in western Oregon. Prevalence of BPD in the adolescent group was 1%. Furthermore, they found 5.7% of the adolescent population qualified for a diagnosis of subsyndromal symptoms of BPD, multiple comorbidities, and associated psychosocial impairment, which may constitute a group of adolescents with BPD NOS. This study was important not only for prevalence data but it also was the first study to examine the different types of BPD in adolescents.

Lewinsohn and colleagues (2000) went on to analyze data from the Oregon Adolescent Depression Project (OADP), in a follow up interview, they assessed the same subjects from their 1995 study, at 24-years of age. They categorized their subjects into the following sections: Bipolar disorder, subsyndromal symptoms (identifies to have some symptoms of BPD but did not meet the full criteria as
per the DSM IV), Major Depressive Disorder, Disruptive Behavioral Disorder, and a Non-Diagnosed comparison group. The researchers specifically examined adolescents with subsyndromal symptoms of BPD, because they observed many children and adolescents with hypomania and mania who did not meet the threshold of full diagnostic criteria for BPD. They found of the 1,507 subjects, at the follow-up time period, 5% of them had a lifetime prevalence of subsyndromal symptoms of BPD. This was a significant study because the researchers found that the adolescents diagnosed with the subsyndromal symptoms of BPD suffered the same number and severity of symptoms as or even more than the individuals diagnosed with BPD (I, II, Cyclothymia) (Lewinsohn et al., 2000). In this study the subsyndromal symptoms group can be compared to children who are diagnosed with BPD NOS. Specifically, in this study the subjects had BPD symptoms that did not meet criteria for BPD I or II (Lewinsohn et al., 2000). To date this is one of only two studies to examine the prevalence and incidence of BPD, and subsyndromal symptoms of BPD. Both prevalence studies examine adolescents. Thus, there continues to be limited information regarding prevalence of BPD and subsyndromal symptoms in childhood.
BPD in Children

Researchers and investigators identified adolescents with BPD, but they also observed in their research a considerable number of children with symptoms of BPD. For this study the investigator will categorize children in the age range of 7 through 11 years and 11 months in age.

History of children diagnosed with BPD. Glovinsky (2002) conducted a literature review of the history of childhood-onset bipolar disorder through the 1980’s and reported that researchers and clinicians observed children with BPD in the 18th century. However, it was not until the mid 19th century where there became a specific interest in pediatrics diagnosed with BPD. By the 1980’s many clinicians agreed that BPD symptoms were occurring in childhood.

As described earlier, Carlson in 1994 was one of the first to indicate that pediatric BPD might be atypical by adult standards, in regards to mood presentation and lack of distinct cycling. She reported the most common symptoms of mood disturbance in children with BPD are irritability, associated with crying and psychomotor agitation. Further, Carlson and colleagues found that the course of pediatric BPD tends to be chronic and continuous rather than episodic
and acute as is characteristic of the adult disorder (Carlson, 1984). Children diagnosed with BPD don’t appear to have the typical adult like symptoms, they present with a chronic course of severe irritability and co-occurring depressive and manic symptoms (Biederman et al., 2000).

Controversies over the past twenty years with early onset childhood bipolar disorder include how to diagnose childhood onset BPD, how to measure and understand the variable clinical presentations, how to deal with symptomatic overlap between common behavioral disorders and BPD, and the effects of developmental on presenting symptoms (Bowring & Kovacs, 1992).

Although some adolescent BPD symptoms are the same in children there are some differences even from the non-classical adolescent BPD presentation. Similarly, children evidence aggression, irritability, destructiveness, and impulsivity (Geller et al., 2000). However, children differ in BPD symptoms such as mixed dysphoric mania, co-occurring with depressive and manic symptoms (Biederman et al., 2000; Biederman, 2003). The absence of clear cut episodes that follow an adjustment showing severe impairments, and pronounced emotional lability (Lewinsohn et al., 2002). In general, children experience multiple
episodes of depression and mania over their lifetime, and
some have fast cycles, switching in between symptoms of
mania and depression during the same week or day (Birmaher,
2004). Children with rapid BPD cycling often have high
intensity and duration of BPD symptoms and BPD is usually
accompanied by other psychiatric disorders (Birmaher,
2004). Thus, children who have mixed depression and mania
symptoms or rapid cycling are more difficult to treat and
have more frequent bipolar episodes in comparison to
children with other types of BPD (Birmaher, 2004).
Today there continues to be controversy over the diagnostic
process of BPD in children (Glovinsky, 2002).
It is unclear whether childhood BPD is an early
manifestation of the classic form of BPD, or if it is a
precursor to subsyndromal bipolar disorder, also known as
BPD NOS (Lewinsohn et al., 2002).

Diagnosis of BPD in children. One of the biggest
breakthroughs occurred at the NIMH conference where
psychiatrists met and agreed that bipolar illness could be
diagnosed in children before puberty (NIMH, 2000a).
However, there is still controversy over the complication
of other overlapping psychiatric disorders (Evans et al.,
2005). Some researchers are skeptical as to the legitimacy
of the diagnosis for children under the age of 12 (Wozniak et al., 2001; Wozniak, Monuteaux, Richards, Lail, Faraone, & Biederman, 2003). However, Wozniak & colleagues, (2003) believe that this skepticism has resulted in a under
diagnosis or misdiagnosis of BPD in children. That is, because children’s BPD symptoms present differently than
adults and adolescents with BPD and the complication of the
child development adds to differentiating overlapping
symptoms of another or comorbid disorder, BPD is likely
unrecognized (Biederman et al., 2004; Birmaher, 2004;

Early-onset studies of BPD. Geller and colleagues
carried out an ongoing study for the past couple of years
examining the phenomenology and course of pediatric child
and adolescent bipolar disorder, funded by the National
Institute of Mental Health (NIMH), at Washington University
School of Medicine in St. Louis (Geller et al., 2000;
Geller et al., 2001a; Geller et al., 2002a; Geller et al.,
2002b; Geller et al., 2004). In their four-year
longitudinal study which examined pre-pubertal and early
adolescent bipolar disorder phenotypes; they examined two
problems when diagnosing children with BPD, symptoms of
irritability and comorbid symptoms of ADHD. In their
studies they used a subject inclusion criteria, specific to mania that differed from the typical use of the term mania, mania was restricted to include elated mood and grandiosity. Geller and colleagues did not include subjects who only reported irritable mood as a depressive symptom. Also, they included subjects with symptoms that overlap with DSM IV criteria for other pediatric psychiatric disorders such as ADHD. The purpose of the studies were to analyze symptoms over a period of time in order to explain the early onset of BPD in children, to clarify the controversy over the differentiation between mania and ADHD, and begin to measure the effects BPD has on children’s overall daily functioning (Geller et al., 2000; Geller, et al., 2001a; Geller et al., 2002a; Geller et al., 2002b; Geller et al., 2004). They recruited Prepubertal BPD group with males and females that ranged in age from 7 to 16 years of age, who were in good physical health, the ADHD group was males and females 7 to 16 years of age, and a control group matched the prepubertal BPD group.
As stated, the Geller et al., 2000 study used cardinal symptoms to differentiate mania from ADHD. To be included in the BPD group they ensured that subjects had at least one of the two cardinal features of mania (i.e., elation and grandiosity), and to allow investigation of a child phenotype that was most likely to be continuous with adult bipolar disorder. In this study 93 subjects were given a full structured interview using the St Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS; Geller, Williams, Zimmerman, & Frazier, 1996). The first analysis of results from a one-year time period reported the mean age of subjects in the study was 10 years and 9 months (SD = 2 years, 7 months). Fifty-one (57.3%) of the subjects were prepubertal, which meant that they identified to have symptoms before the age of 12. Whereas, 89.9% of the subjects showed elation, and 85.4% of the subjects showed grandiosity (Geller et al., 2001a).

In the 2-year follow-up study, four subjects dropped out. Hence, there were 89 subjects, the mean age and onset of the BPD illness was 7 years and 3 months of age (SD = 3 years and 5 months).
They found in this study that children and adolescents with an early onset of BPD have a low rate of recovery from mania and a high rate of relapse after recovery, compared to data on adult-onset mania (Geller et al., 2002a).

Lastly, at a 4-year-time period the children identified with mania, the cardinal symptoms, were tracked on the chronicity of the disorder. The first manic episode was at intake for 70 of the 86 subjects (81.4%). The age of onset for the entire sample (N = 86) was 6 years and 9 months +/- 3 years 5 months. The researchers used a chi square analysis and t-tests for baseline characteristic differences between the 2 groups. Also, in order to measure symptoms, the cumulative probability of recovery and relapse was estimated using the Kaplan-Meier (K-M) method. The researchers found that childhood mania can reliably be differentiated from the ADHD diagnosis. Further, they were able to identify subjects with persistent mania who did not meet the ADHD criteria until follow-up. They also found comparisons for four of the five symptoms, of mania (elated mood, grandiosity, deceased need for sleep, flight of ideas/racing thoughts) provided the best discrimination between children with BPD and the ADHD groups.
Geller and colleagues’ research has provided significant evidence that mania can be diagnosed in children at an early age with a structured interview that includes rule out criteria to distinguish mania from ADHD symptoms (Geller et al., 2004).

Biederman and associates (2004) agree that despite the debate of the early onset of BPD symptoms in children there is a growing consensus that many seriously disturbed children are afflicted with severe mood dysregulation and pose with symptoms that indicate the diagnosis of BPD (Biederman, Faraone, Chu, & Wozniak, 1999; Biederman et al., 2004). Biederman and colleagues (2004) conducted a longitudinal study examining children 12 years or younger who were referred to the child psychiatry clinic from 1995-2002. They found children who had BPD like symptoms with high rates of mixed mania and rapid cycling. Further, children diagnosed with BPD, who have severe and persistent irritability, were significantly associated with violent behaviors (Biederman et al., 2004). This finding supports the findings of mixed mania (with symptoms of MDD and mania occurring simultaneously) in BPD children.
Also, the earlier the onset of BPD, the greater the frequency of mixed states, and the increased the risk for mixed BPD throughout the life cycle with its complex course and poor therapeutic response (Biederman et al., 2004).

In summary since the roundtable discussion in April 2000, researchers have agreed upon the diagnosis of BPD in children (NIMH, 2000a), which includes BPD I, BPD II, BPD NOS. The researchers agree that children are experiencing shorter episodes or non-episodic continuous pattern of mood instability characterized by irritable rages, temper tantrums, aggressiveness, and rapid change in moods. Of course in each classification there is a range of BPD symptoms, number and severity, resulting in a spectrum phenotype of BPD. Children diagnosed with BPD are all reported to evidence significant psychosocial impairments, however there is not documented research that analyzes the specific classification of BPD and effects on psychosocial functioning (Lofthouse & Fristad, 2004; Lewinsohn et al., 1995; Lewinsohn et al., 2000; Lewinsohn, Seeley, & Klein, 2003; NIMH, 2000a). Understanding the differences in psychosocial impairments is yet to be documented in the literature, and is discussed in the next section.
Psychosocial Functioning

Although there is an increase in studying the characteristics and treatment of child and adolescent mania, but there is less attention given to the psychosocial implications of the illness. When a child is diagnosed with any mental illness, especially BPD, their psychosocial functioning is negatively impacted and these children have difficulties in school, interacting with others and overall daily functioning. The earlier the onset of BPD in children, the more severe the psychosocial impairment and negative prognosis for improvement. For example, BPD symptoms wreak havoc on family life, school functioning, and peer relationships (Lewinsohn et al., 2003). Also, Geller and researchers (2000) report that it is relevant to examine and to use the history of children diagnosed with depression and the effects it has on their psychosocial functioning, because depression is a component of the diagnosis of BPD. It is likely that a child with an early onset of BPD would be associated with significantly more psychosocial impairments as compared to the adult data on mania.
Because of limited literature on child and adolescent BPD and social difficulties, the investigator will briefly review the adult literature and the impact BPD has on adult psychosocial functioning.

**Psychosocial Functioning in Adults**

Generally, psychosocial functioning in adults is defined as occupational functioning, interpersonal relationships, and global functioning (Coryell, Andreasen, Endicott, & Keller, 1987; Tohen, Waternaux, & Tsuang, 1990). BPD has been shown to negatively impact an adult’s social functioning, before, during, and after an episode. For example, the level of functioning ability in an individual’s social relationships, occupation, and marital stress were negatively affected by an individual’s prior BPD episodes and in between their episodes of mania and depression (Bauwens, Tracy, Pardoen, Vander, & Mendelewicz, 1991). Also, longitudinal researchers show adults diagnosed with BPD function worse after a manic or depressive episode and have greater difficulties with their overall occupational and educational status (Tohen et al., 1990). Because of the great impact of BPD symptoms have on adult’s psychosocial functioning, early identification in children is imperative.
Psychosocial Functioning in Adolescents and Children

The primary areas of a child’s psychosocial functioning include school and home functioning, and interpersonal relationships. School functioning, includes school behavior, such as relationships with teachers, academic achievement, and the relationships to peers (Puig-Antich, Kaufman, Ryan, et al., 1993). Whereas, at home a child’s functioning is relative to interactions with the child’s mother, father, and siblings. Also, it is important to examine a child’s total or overall psychosocial functioning by examining the behavior in the home and in school together (Puig-Antich et al., 1993). A child’s psychosocial functioning is described as interpersonal relationships, academic performance, household duties, satisfaction of life, recreational activity, and overall global functioning (Johnson & McCutcheon, 1980). For this study, a child’s psychosocial functioning will be examined by the overall global functioning and three subscales of: 1) Family relationships, 2) Relationships with friends, and 3) School functioning. As noted, because there is limited information on BPD and the categories of psychosocial functioning and because children diagnosed with MDD were
found to have impairments prior to and after a depressive episode it is relevant to reference these research studies to give a context to the current study. Therefore, the investigator will review research studies conducted with adolescents and children who suffered from depression and the impact it had on their psychosocial functioning, following that the investigator will review the research conducted with adolescents and children diagnosed with BPD and the impact it had on their psychosocial functioning.

Depression. Depression is an important component of children who suffer from BPD. This section will examine research studies that examined the effects depression had on a child’s psychosocial functioning, the recovery from depression and the effects it has on their school functioning, family interpersonal relationships, and relationships with friends.

Different researchers have studied that depression has a significant impact on a child’s psychosocial functioning. For example, Kovac and colleagues (1984) found in their studies with children diagnosed with depression that the younger the child is diagnosed with depression the more likely the youth will have difficulty with psychosocial functioning and coping with the illness.
Puig-Antich and colleagues (1985; 1993) conducted two longitudinal studies, which were the first to examine children and adolescents diagnosed with depression and the effects it had on their psychosocial functioning. Puig-Antich and investigators (1985) report it is crucial to observe a child before and after an episode, in order to have an understanding of an individual's psychosocial functioning because it will assists with the treatment progress. They examined psychosocial functioning in pre-pubertal children during an episode of MDD and after the sustained affective recovery from the episode for at least four months. They examined 21 pre-pubertal children who fully recovered from an episode for at least 4 months. They used the Psychosocial Schedule for School Age Children (PSS; Lukens, Puig-Antich, Behn, Goetz, Tabrizi, & Davies, 1983) it is a semi-structured interview designed to elicit and record data regarding the developmental and past symptomatic history of the child, as well as demographic data that measures adaptation, interpersonal relationships, and family functioning that is thought to be relevant to child and adolescent psychiatric disorders. Responders were given the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (Kiddie-SADS;
Chambers, Puig-Antich, Hirsch, Paez, & Ambrosini, 1985), it is a semi-structured interview after completing their medication regime. Only patients whose recovery persisted for at least one drug-free month were restudied. The results indicated that children who recovered from a depressive episode were functioning better in school than while depressed, their behavioral problems in school decreased, they had better relationships with teachers, and better academic achievement abilities (Puig-Antich et al., 1985). Mother’s reported that the mother child relationships were partially better upon recovery and there was a decrease in hostility and punishment in the household. It was reported that there was an increase in the communication between the father and the child after recovering from a depressive episode. With peer relationships, there was substantial evidence, reporting the improvement of peer and sibling relationships upon recovery. Also, there was a significant increase in the frequency of contacts with friends. Children who recovered from a depressive episode were less shy and were teased less by their peers (Puig-Antich et al., 1985).

Puig-Antich and colleagues (1993) conducted a second study, which examined the measures of functional impairment
and family relations in a sample of 100 adolescents with 62 diagnosed with MDD and 38 controls with no history of psychiatric illness. In their literature review they examined how previous studies have indicated that preadolescents with high levels of depression have significant family dysfunction, problems in peer relations, and lowered academic achievement. In this study, Puig-Antich and colleagues (1993) examined depressed adolescents and normal controls, mother-child relationships, father-child relationships, the parents-spousal relationship, sibling relationships, peer relations, and school performance.

Again, data was collected using the Psychosocial Schedule for School Aged Children (PSS; Lukens et al., 1983), it is a semi-structured interview designed to elicit and record data regarding the developmental and past symptomatic history of the child, as well as demographic data that measures adaptation, interpersonal relationships, and family functioning that is thought to be relevant to child and adolescent psychiatric disorders. The researchers wanted to measure five domains: the mother-child relationship, father-child relationship, spousal relationship, peer relationships, and school performance.
(Puig-Antich et al., 1993). The researchers found that adolescents with MDD were found to have severe psychosocial functioning problems; whereas 95% of the depressed adolescents had scores greater than 2 standard deviations above the mean of the normal controls on one or more of domain ratings. They found that adolescents with difficulties in parent-child relations were more likely than those adolescents without problems in family relations to have difficulties in peer relations and school performance. This study provides evidence that depressed adolescents have significant psychosocial impairments in multiple domains when compared with normal control adolescents. Notable difficulties were found in mother-child relationships, father-child relationships, spousal relationships, sibling relationships, peer relationships, and school performance. The researchers found that when the depressed child experienced one psychosocial struggle, it was associated with an increased risk of problems in other areas.
For example, problems with family relationships were related to problems with peer relationships and school performance (Puig-Antich et al., 1993). Because depression is a component of BPD it is likely children with BPD will show similar social difficulties.

Bipolar Disorder. Similar to the depressive studies conducted with children, and studies with adults who have suffered from BPD, they both demonstrate the effects disorders had on psychosocial functioning. In the same way, children and adolescents diagnosed with BPD are likely also to have negative consequences. For example, Birmaher (2004) reports children and adolescents with BPD can suffer from the following difficulties: Normal emotional, cognitive, and social development; Interpersonal difficulties with family, friends, teachers, and others; Increased behavior problems, causing disciplinary and legal problems; Poor academic functioning; Increased hospitalizations; Heavier emotional and economic burden to family; Greater use of tobacco, alcohol, and illicit drugs, such as marijuana; and Increased risk for suicide attempts and suicide. When a child experiences the symptoms of mania and depression it is likely to interfere with school performance, interpersonal relationships with family and friends, and
other responsibilities (Birmaher, 2004; Papolos & Papolos, 2002). With every episode of BPD, the child is more likely to act out, have a temper tantrum, fight with peers, siblings and parents, and get into trouble at school and in the home (Birmaher, 2004; Papolos & Papolos, 2002).

In the home, a child with BPD may bring many family struggles into the household with ongoing problems of acting out, temper tantrums, mood swings, problems in school, disobedience, which may cause continuous conflicts in the home (Birmaher, 2004). These conflicts may affect the relationships the child has with their parents and siblings for years (Papolos & Papolos, 2002). When examining family relationships it is essential to examine interactions with family members such as a child’s mother, father and siblings. Previous researchers have found that it is important to examine the relationship between the mother and the child during an episode because the child’s mental illness increased the rate of conflict between the child and mother (Kashani, Beck, & Hoeper, 1987).

The school setting is where a child spends most of the day, it can be fast paced with many transitions. Thus there are heavy demands to pay attention, behave appropriately, complete individual tasks or group work, and additionally
experience complicated and stressful interactions with teachers and peers (Papolos & Papolos, 2002). With all of these heavy demands in school, specifically, a child diagnosed with BPD would have significant difficulties with all of these areas due to their illness. When examining psychosocial functioning in school, researchers rate the child’s academic performance, teacher relationships, and peer relationships. Academic and school functioning is a good measure of a child’s psychosocial functioning because children that are suffering from a mental illness demonstrate poorer academic performance during an episode (Puig-Antich et al., 1985).

In adolescents and children there are limited studies that examine childhood onset of BPD and the effects it has on a child’s psychosocial functioning. Some studies have examined how the earlier symptoms of BPD are associated with poorer psychosocial functioning, such as the reoccurring of severe symptoms, and the hospitalizations to stabilize the BPD symptoms (Carlson et al., 2002).
Psychosocial functioning in adolescents. Carlson and researchers (2002) conducted a longitudinal study that examines how early onset of childhood psychopathology effects a 2-year clinical and functional outcomes in first admission patients with BPD I. Carlson and colleagues (2002) argue that the earlier the onset the poorer pre-morbid functioning may be associated with poor course and outcome in BPD. In this study they interviewed 637 subjects, 537 were assessed at 24 months, of whom 123 received a diagnosis of DSM IV bipolar I disorder. They conducted a Structured Clinical Interview for DSM III R (SCID; Spitzer, Williams, Gibbon, & First, 1992) histories, collected school and medical records, and interviews with significant others. The early-onset bipolar disorder was defined as a first affective episode before the age of 19. The researchers found that twenty-seven of the subjects with an earlier age of onset, demonstrated significantly poorer results on course and outcome of the disorder. The researchers also found age at onset was related to poorer functional outcome and episode relapse or recurrence of BPD I (Carlson et al., 2002).
This study is relevant because the research findings in this study with adolescents indicated that the earlier the onset the poorer the outcome. Hence, children diagnosed with BPD at an earlier age, would be predicted to have a poorer outcome.

Another group of researchers, Lewinsohn et al. (1995), examined the course and outcome of BPD in adolescents. They conducted an epidemiological study of community samples of adolescents. In this study they used data from the Oregon Adolescents Depression Project (OADP), it is a community-based, longitudinal investigation of epidemiology of psychiatric disorders of a cohort of 1,709 high school students. They conducted a structured diagnostic interview using the Schedule for Affective Disorders and Schizophrenia for School-Age Children that combined features of Epidemiologic version of (K-SADS-E; Ovashchel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982) and the Present Episode version (K-SADS-P) and included additional items to derive diagnoses of most disorders as per DSM-III-R criteria (APA, 1987). They used the Global Assessment of Functioning (GAF; Endicott, Spitzer, Fleiss, & Cohen, 1976) scores to examine the level of functioning during the time of the interview and for the past year, and they used the
Longitudinal Interval Follow-up Evaluation (LIFE; Keller, Lavori, Friedman, Nielson, Endicott, McDonald-Scott, & Andreasen, 1987) to measure exhibited impairment in social, family, and school functioning as part of an affective episode. Among the 1,507 adolescents reevaluated 12 months later, there were 15 cases of identified bipolar disorders. Overall between the two evaluations they identified a total of 18 cases of BPD with the mean age of the onset of BPD symptoms was 11 years and 7 months (SD = 2.96). When using the DSM III-R, they found 2 subjects met criteria for BPD I, 5 met criteria for BPD II, and 11 met criteria for BPD NOS. Ninety-seven of the subjects identified as Core positive group, had symptoms of bipolar disorder of elevated, expansive, or irritable mood, but never met criteria for bipolar disorder.

They found that the bipolar subjects exhibited poorer functioning on the GAF scale, both during the interview and for the past year. The BPD and core positive groups identified significant impairment in social, family, and school functioning as part of their episode. Lewinsohn and colleagues (1995) also examined and controlled for the demographic variables because they can an effect a youth’s psychosocial functioning. They found that 66.7% diagnosed
bipolar cases were female and 33.3% were male. When examining living situation, 38.9% were living with both biological parent and 61.1% were living in a different living situation.

In 2000, Lewinsohn, Klein, Seeley used the OADP data from the previous study, and conducted a second follow-up with the subjects, using a stratified assessment again at 24-years of age, using the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) and the Longitudinal Interval Follow-up Evaluation (LIFE; Keller et al., 1987). At this time, a direct interview was completed with the first-degree relatives. They studied these adolescents into adulthood to examine the incidence and prevalence, also to examine the recurrence and psychosocial consequences of their disorder. Lewinsohn and colleagues (2000) felt that it was relevant to study adolescents with subsyndromal symptoms because they have observed many children and adolescents with mania and hypomania, who fail to meet full diagnostic criteria for BPD. In their previous research study (1995) they observed subjects who had subsyndromal symptoms showed high levels of impairment and comorbidity of other disorders. The researchers felt it was important to examine the subsyndromal symptoms
because they eventually led to the diagnosis of BPD. Subjects were interviewed at the third interview, 24-years of age, using the LIFE (Keller et al., 1987), which elicited detailed information about the course of the psychiatric symptoms and the disorder since the previous interview, and information on the current and past psychosocial functioning. For this study, the BPD group was collapsed (BPD I = 4; BPD II = 11), the subsyndromal (distinct period of abnormally and persistently elevated, expansive, or irritable mood, in addition to having one or more manic symptoms, but never having met criteria for BPD) group consisted of 48 subjects.

The investigators found in their research that adolescents with BPD and subsyndromal symptoms both exhibited significantly greater psychosocial impairment, poorer global functioning, and were more likely to utilize mental health services. Adolescents with subsyndromal symptoms completed significantly fewer years of education and were significantly less likely to earn a Bachelor’s degree (Lewinsohn et al., 2000). Also, in this study, Lewinsohn and colleagues (2000) controlled for demographic characteristics, again they found a significant proportion of female participants 70.6% diagnosed with BPD and 62.5%
diagnosed with subsyndromal symptoms. Youth diagnosed with BPD were less likely to live with their biological parents (29.4% living with biological parents), whereas 70.6% did not live with their biological parents. Because Lewinsohn and his colleagues (2000) found these significant differences, they used these demographic variables in their study as covariates.

Lewinsohn and colleagues (2003) reviewed their studies with adolescents and indicated that one of their limitations is the fact that they evaluated subjects in a high school setting, therefore there were a low number of students with the diagnosis before the age of 10, they report that it could be due to their sample selection, that is very few adolescents with prepubertal BPD attend public high schools. Lastly, another restriction on the number of students diagnosed with pre-pubertal BPD, is due to the version of the K-SADS that they used. At the time they did not have items that included ultradian cycling which could measure the symptoms in younger children (Lewinsohn et al., 2003).
Psychosocial functioning in children. There are only two studies to date conducted by Geller and colleagues (2000; 2002), examining children diagnosed with BPD and the effects it has on their psychosocial functioning. Geller and her colleagues (2000) reports there is an increasing interest in studying the characteristics and treatment of child and adolescent mania, although there is less attention given to the psychosocial functioning. In examining the adult data, they argued children and adolescents could suffer in a similar manner with their psychosocial functioning (Geller et al., 2000). They used the data set from their previous studies, described previously, of children and adolescents, males and females with BPD from 7 to 16 years of age, in good physical health, the ADHD group of males and females ranging in age from 7 to 16 years of age, and a control group that matched the prepubertal BPD group. In this study 93 subjects were given a full structured interview using the Washington University of St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS; Geller et al., 1996), this version uses DSM IV criteria relevant to prepubertal and early adolescent years and the Psychosocial Schedule for School-Age Children Revised (PSSR; Puig-Antich
et al., 1986) was administered separately to the mothers about their children and to the children themselves by the research nurses. The results indicated that the prepubertal subjects had significantly greater impairments on the child-parent and child-peer interaction scales, which meant they demonstrated poor maternal-warmth and there was maternal and paternal tension and hostility in the household. They also reported poor social skills, few peer relationships with few or no friends (Geller et al., 2000). When reviewing the demographic variables, there were 61.3% of males diagnosed with an early onset versus 38.7% of females. The overall mean CGAS score was 43.3, which is poor psychosocial functioning. When analyzing living situation, the study indicated 54.8% of subjects lived with their biological parents and 45.2% lived in another situation.

Geller and colleagues (2002) analyzed the data at a two-year follow-up time period and used the Psychosocial Schedule for School-Age Children Revised (PSSR; Lukens et al., 1983) to analyze the symptoms that the children were exhibiting and to monitor the effects the disorder had on their psychosocial functioning. At a two-year time period, 51(57.3%) of the subjects were pre-pubertal, with the mean
age of onset of BPD symptoms 7 years and 3 months (SD = 3.5). The results indicated that there was low maternal warmth, which had significantly predicted relapse after recovery; subjects with low maternal warmth were 4.1 times more likely to relapse faster. Overall, when compared to both the ADHD and Control subjects, prepubertal BPD cases had significantly greater impairment on items that assessed maternal-child warmth, maternal-child and paternal-child tension, and peer relationships (Geller et al., 2002). At a four-year time period when Geller and colleagues (2004) evaluated the children and their mother’s, they found that a predictor of relapse in children was low maternal warmth, as identified at the two-year follow up of impaired expressed emotion between the child and mother.

There continues to be a number of studies evaluating the symptoms of BPD in children but there seems to be a lack of research in the type of BPD (I, II, NOS) and the effects it has on their psychosocial functioning. As stated from the NIMH roundtable conference in 2000, more children fit into the category of BPD NOS because they do not fit into the classification of DSM IV Text revised of BPD I or II (Lewinsohn et al., 2000; NIMH, 2000a, Lofthouse & Fristad, 2004). There are minor modifications to the DSM
III-R and the DSM IV TR criteria for diagnosis of BPD, which can be used with children and adolescents (Lewinsohn et al., 2002). Investigators such as Lewinsohn and colleagues (1995; 2000; 2002) conducted significant research with adolescents and identified adolescents with BPD and subsyndromal symptoms suffer significantly with psychosocial impairments. Whereas, Geller and her group (2000; 2001a; 2002a; 2004) identified children diagnosed with pre-pubertal BPD and demonstrated the effects it has on their psychosocial functioning. There has not been a study in which examines children with the different types of BPD I, II, NOS (especially BPD NOS), and the impact it has on a child’s psychosocial functioning.
CHAPTER III

METHOD

Participants for this study are from a de-identified data set provided by the Course and Outcome for Bipolar and Youth (COBY) study. COBY is a naturalistic, high-intensity, longitudinal multi-site study (i.e., University of Pittsburgh Medical Center, UPMC; University of California Los Angeles, UCLA; and Brown University), funded by the NIMH in July 2000. Subjects in the COBY study were recruited from inpatient and outpatient clinics, state hospitals, mental health centers, residential settings, private physicians, juvenile justice, and through advertisement, all are diagnosed with a BPD spectrum disorder. Thus, subjects were drawn from a broad range of clinical sources, and advertising extended recruitment to capture those individuals who were not currently receiving services. Subjects were recruited from various ethnic groups. However, effort was made to recruit minorities through advertisement in ethnically diverse neighborhoods and community settings (e.g., places of worship, schools, health clinics, etc...).
Participants

Intake data from 438 subjects (n= 192 children, n= 246 adolescents), who ranged in age from 7 years 0 months through 17 years 11 months was collected at all three sites between 2000 and 2005. Demographic information collected includes age, sex, race, socioeconomic status, and living situation.

Instruments

The following instruments provided data for the diagnosis of bipolar disorder: 1) Schedule for Affective Disorders and Schizophrenia for School Age Children, Present and Life Version (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1995), 2) Affective Disorders and Schizophrenia for School Age Children Mania Rating Scale (K-SADS MRS; Axelson et al., 2003), 3) Depression Section of the K-SADS-Present Episode Version (K-SADS-Dep 12; Geller et al., 1998).

The K-SADS-PL (Kaufman et al, 1995) is a semi-structured interview that measures a child’s current and past emotional symptoms. It is designed to ascertain present episode and lifetime history of a psychiatric illness, according to DSM-IV criteria for children and adolescents between the ages of 7 and 18 years old. The K-
SADS-PL provides detailed information on 31 different diagnoses in the following syndrome groups: 10 affective disorders, two eating disorders, seven emotional/anxiety disorders, four behavioral disorders, five schizophrenic/psychotic disorders, and three other disorders. The interview process of the K-SADS-PL requires the same clinician to interview parent and child individually using the same questions about the child’s symptomatology. Both informants are to report the most intense time period over the last 12 months of the designated present illness. A second severity of symptom rating is required for those symptoms reported in the previous week. Each symptom then has three pairs of scores: the parent, child, and summary rating from the interviewer.
The K-SADS-PL manual reports high reliabilities across all parallel time frames between parent and child, and between each informant and summary scoring. Ambrosini and colleagues (1989), reported good rater reliability, as identified with a coefficient of .91 among raters, and when rating the symptoms of a child within the last week the raters had a high reliability of .93, which indicates good inter-rater reliability (Ambrosini, Metz, Prabucki, & Lee, 1989). The closer a reliability coefficient is to 1.0 the stronger the reliability.

The K-SADS MRS (Axelson et al, 2003) is a 13-item rating scale with scores ranging from 0 to 64. It consists of the following items from the K-SADS-P mania section: 1) elated mood, 2) irritability, 3) unusual energy, 4) grandiosity, 5) decreased need for sleep, 6) racing thoughts/flight of ideas, 7) increased goal-directed activity/motor hyperactivity, 8) distractibility, and 9) poor judgment. In addition to assessing common manic symptoms, it includes the K-SADS-P items that assess the presence and severity of hallucinations and mania, and a separate item was added to assess mood lability.
In the original psychometric study (Axelson et al., 2003), the K-SADS MRS was shown to be a reliable measure of symptom severity (Cronbach’s alpha = .94 and inter-rater reliability = .97 between 2 raters). Also, the measure is reported to be sensitive to changes in manic symptom severity, and thus is often used to track the effect of treatment over time (Axelson et al., 2003).

The K-SADS-Dep 12 is a subset of 12 items on the semi-structured interview from the Washington University K-SADS. It measures depressive symptoms rated on a 6-point scale, from none to severe. The K-SADS-Dep 12 has shown to be a reliable measure of symptom severity (Geller et al., 1998).

Psychosocial Functioning

The Longitudinal Interval Follow-up Evaluation Adolescents (A-LIFE; Keller et al., 1987) and the Children’s Global Assessment Scale (CGAS; Shaffer, Gould, Brasic et al., 1983) were used to measure psychosocial functioning. The A-LIFE (Keller et. al, 1987) was selected to assess longitudinal course of psychiatric disorders and psychosocial functioning. Originally the LIFE was a semi-structured interview that has shown excellent reliability for examining course and outcome of illness in adult-onset of affective and anxiety disorders (Keller et al., 1987;
Warshaw, Keller, & Stout, 1994; Warshaw, Dyck, Allsworth, Stout, & Keller, 2001). Keller and colleagues adapted the LIFE for use with adolescents now titled A-LIFE. The A-LIFE records week-by-week changes in psychiatric symptomatology using a six-point psychiatric status rating, intensity of treatment exposure, and level of psychosocial functioning (Keller et al., 1987). The A-LIFE has been used successfully in other longitudinal assessment studies of children and adolescents with psychiatric disorders (Lewinsohn et al., 2000).

The A-LIFE interview is administered to adolescents and their parents independently. The interviewer then clarifies any discrepancies between informant responses. Young children (<12 years of age) and their parents were administered the A-LIFE together. The A-LIFE includes the following subscales: Student Work; Interpersonal Relations with Family; Interpersonal Relations with Friends; Work Status; Employment or Self Employment; Household Duties; Recreation; Sexual Functioning/Sexual Activities; Satisfaction; and overall Global Social Adjustment. Based on the literature review, Interpersonal Relations with Family, Interpersonal Relations with Friends, School Work and the overall Global Social Adjustment is used in the
study. It should be noted that the initial interview of the ALIFE is called the ALIFE BASE because it examined baseline ratings about the subject’s usual level of functioning in each of these areas and rates the worst week for the past month (Keller et al., 1987). Low scores on the A-LIFE are indicative of better functioning and high scores indicate poorer functioning. Keller et al. (1987) found that current functioning items had higher reliability than items measuring past functioning with adults.

In studies conducted with adolescents, Lewinsohn et al. (2000) demonstrated good inter-rater reliability for baseline and moderate to excellent for lifetime diagnosis of BPD (k=.74), MDD(k=.86), anxiety(k=.87), alcohol abuse/dependence(k=.77), and drug abuse/dependence(k=.94).

The CGAS (Schaffer et al., 1983) is a rating scale used to evaluate overall level of psychosocial functioning for a child or adolescent during a specified time period. The CGAS is an adaptation of the Global Assessment Scale (GAS; Endicott et al., 1976). In the COBY study, after interviewing both parent and subject during intake each clinician rates the child’s overall functioning. The lower score values represent greater functional impairment. For example, 1 describes the sickest and 100 describes the
healthiest individual. The scale is divided into ten equal intervals: 1 to 10, 11 to 20, and so on to 91 to 100. Most outpatients score in between 31 to 70, and most inpatients score between 1 and 40 (Endicott et al., 1976). The GAS is reported to have good reliability, where correlation coefficients over five studies ranged from .69 to .91 (Endicott et al., 1976; Shaffer et al., 1983). The closer the reliability coefficient is to 1.0 the stronger the reliability.

The CGAS demonstrates good concurrent validity by correlating well with other independently rated measures of impairment severity, relationship to re-hospitalization, and sensitivity to change. Specifically, moderate to good correlations were reported for overall severity (Endicott et al., 1976; Shaffer et al., 1983). The closer the validity coefficient is to 1.0 the stronger the validity.

Procedures

Recruitment of subjects is on-going for the COBY study. Subjects are evaluated at intake and 6 month follow-ups for diagnosis, psychosocial functioning, and response to applied treatments using interviews and rating scales.
Data for the COBY study was collected from multiple informants: the primary caregivers, the child, and the interviewer.

The initial contact was completed by the research coordinator under direct supervision from the PI/CO-PI. This evaluation gathered data for the following domains: Disease-Specific, Functional Outcome, and Treatment Exposure. Intake data also includes a parent report of the subjects’ lifetime psychiatric history and family history of affective disorders in first-degree relatives. Family demographic data was collected, and the presence of negative life events during each period of follow-up was documented. The subjects’ personal data was updated regularly to track living arrangements in the event that they would move within, or outside of the study catchment area.

The initial interview at intake was conducted by a trained research clinician using the K-SADS-PL (Kaufman et al., 1995), K-SADS MRS (Axelson et al., 2003), K-SADS-Dep 12 for refined analysis of the subject’s depressive symptoms.
During the initial assessment the research clinician also administered the psychosocial section of the A-LIFE and the CGAS in order to receive an accurate assessment of the psychosocial course and outcome of the participants in this study.

In the COBY study the subjects had to meet criteria for a DSM-IV bipolar disorder (e.g., I, II, and bipolar disorder NOS). The diagnostic criteria for BPD NOS are informed by the NIMH definition allowing for a broad range of bipolar disorder symptoms. At a minimum, the following criteria must be met: a) subject must have elated mood, plus 2 associated symptoms (e.g., grandiosity, decreased need for sleep, pressured speech, racing thoughts, increased goal-directed activity, etc.), or irritable mood plus 3 associated symptoms; b) demonstrate a change in his/her level of functioning (increased or decreased); c) symptoms must be present for a total of at least 4 hours within a 24-hour period; and d) subject must have had at least 4 episodes of 4 hours duration or a total of 4 days of above-noted symptom intensity in his/her lifetime. In addition, to being diagnosed with BPD NOS, the child will need to have a score < 70 on the Children’s Global Assessment Scale (C-GAS) at intake. The exclusion criteria
was if the subject had a current or lifetime DSM IV diagnosis of Schizophrenia, Pervasive Developmental Disorder or Mood Disorders due to substance abuse, a medical condition, or secondary to use of medications, and subjects with a score on the Verbal Subscale of the Wechsler Intelligence Test for School-age Children, Third Revision (WISC III)<70.

The COBY study is a longitudinal study, and missing data are a common difficulty in longitudinal studies. The COBY study used the following approach to handle missing data. For occasional (randomly) missing data, they used imputation methods as implemented in SOLAS (1998), a software package that implements imputation routines. Although dropouts are expected to be small in number, the reason(s) for dropping out is recorded.

In the COBY study the Project Coordinators were trained to administer and score the K-SADS-PL and the A-LIFE. During this training, reliability tests among the program coordinators were performed until a reliability of a .8 is achieved. In order to maintain acceptable reliability in the COBY study among sites, the project coordinator at each site audio taped 20% of K-SADS-PL and A-LIFE interviews per year, these protocols were scored
independently and compared for accuracy. Also every 4 months the Project Coordinator listened to 2 interviews audio-taped by each interviewer in order to provide feedback to individual interviewers.

Data Analysis

Several pre-analyses are required prior to running the main analyses. The first pre-analysis, examines the
correlation between the demographic variables Age, Sex
(Male and Female), Race (e.g., African American, Caucasian, Mixed/Multi-race), Socioeconomic status (combination of parental education and reliance on public assistance), and Living Situation with the dependent variables of CGAS, GSA ALIFE, Family and Friend Relationships, and School Work. The demographic variables of Age and SES are correlated to the dependent variables using a Pearson correlation analysis due them being continuous and SES being a quasi-interval variable. Sex, Race, and Living Situation are correlated to the dependent variables by using a point-biserial correlation coefficient analysis because they are continuous by true dichotomus variables.
The second pre-analysis examines the demographic variables and the independent variable of Bipolar Disorder (i.e., I, II, NOS). The variable of age was examined through the Analysis of Variance because it is a continuous variable, Bipolar Disorder was the independent variable and Age was the dependent variable. The other variables of Sex (3 x 2), Race (3 x 7), SES (3 x 5), and Living Situation (3 x 2) is compared to Bipolar Disorder with a Chi Square analysis.

The next pre-analysis examines the correlation between the demographic variables and the independent variable Age of Onset. The independent variable Age of Onset was compared to the demographic variable of Age (dependent variable) by using an Analysis of Variance. The demographic variables of Sex (3 x 2), Race (3 x 7), SES (3 x 5), and Living Situation (3 x 2) was compared to Age of Onset by using a Chi Square analysis.

The fourth pre-analysis examines the correlation between the Children’s Global Assessment Scale and the Global Social Adjustment from the ALIFE to determine the overlap in variance between the scales. This pre-analysis was calculated using a Pearson correlation.
Assumptions

Prior to running the main analyses, all the assumptions were analyzed. Specifically, the assumptions associated with Multivariate Analysis of Variance and Covariance was examined, including: Linearity, Multivariate Normality, Homeogeneity of Variance-Covariance, and Multicollinearity to examine the presence of outliers and influential data points. Each of these steps will be discussed below.

Linearity

Linearity is an assumption of Multivariate Analysis of Variance. The relationship between dependent and independent variables can only be accurately estimated when the relationships are linear. In order to verify the assumption of linearity, a scatter plot in which the residuals were plotted against the predicted scores, was created. The scatter plot is then examined for linearity between the dependent and independent variables.

Multivariate Normality

The assumption of normality is the assumption of a normal distribution. To evaluate this assumption, skewness and kurtosis for each variable is calculated.
Skewness is a measure of how symmetrical the data are and kurtosis refers to the degree of peakedness of the distribution (Tabachnick & Fidell, 2001). Values greater than +3 or less than -3 are considered extreme values for skewness and kurtosis (Tabachnick & Fidell, 2001).

Homeogeneity of Variance-Covariance

Homeogeneity of Variance-Covariance Matrices was examined for robustness, sample variances for each DV is compared across groups. The Box M test was used to report if there was variance across dependent measures (Tabachnick & Fidell, 2001).

Multicollinearity

Multicollinearity refers to the presence of moderate to high correlations between predictor variables (Stevens, 1999). Stevens (1999) cites three problems which may be incurred when multicollinearity exists. First, multicollinearity severely limits the size of R, or the multiple correlation coefficient, thereby limiting the researcher’s ability to uncover the unique variance accounted for by a specific predictor (Stevens, 1999). Second, multicollinearity complicates the researcher’s ability to determine the importance of a predictor, as the effects of the predictors are confounded (Stevens, 1999).
Lastly, multicollinearity increases the variances of \( R \), thereby increasing the instability of the prediction equation (Stevens, 1999). Multicollinearity and independence of residuals were examined through the analysis of Mahalanobis Distance values to examine if there were any multivariate outliers on the dependent variables.

**Main Analyses**

The first research question examines if youth diagnosed with BPD NOS, regardless of onset, evidenced poorer psychosocial functioning than those with BPD I or BPD II. For this first research question, a Multivariate Analysis of Variance (MANOVA) was used to examine the different types of Bipolar disorders (I, II, NOS) and the levels of psychosocial functioning for each. The independent variables for this analysis was the different types of bipolar disorders (I, II, NOS) and the dependent variables were the overall psychosocial functioning reported from the CGAS and the GSA ALIFE. Prior to running the MANOVA, the test of assumptions is examined and answered: 1) the test of multivariate normality was examined by computing the skew and kurtosis of each variable, 2) the assumption of linearity was examined to see if the DV’s in each group had reasonably balanced distributions, 3) the homeogeneity of
variance assumption checked for variance across dependent measures, 4) multicollinearity and independence of residuals were examined through the analysis of Mahalanobis Distance values to determine if there were any multivariate outliers on the CGAS and GSA ALIFE.

The second research question examined if youth diagnosed with BPD in childhood (e.g., Childhood Onset < 12 years of age) had poorer psychosocial functioning than youth with a late onset of the disorder (> 12 years of age). A Multivariate Analysis of Variance was used for this analysis. As stated, the pre-analysis determined if there were any variables or covariates to be used for this analysis. Subjects were separated into three groups: 1) Childhood Onset, defined as subjects <12 years of age who are diagnosed with BPD, 2) Adolescents who report having an Early Onset and was diagnosed with BPD prior to the age of 12, and 3) Adolescent Late Onset, adolescents who were diagnosed with BPD after the age of 12.

The dependent variable was psychosocial functioning measured by the CGAS and GSA ALIFE. The assumptions described above of normality, linearity, homogeneity of variance, and multicollinearity was analyzed prior to running the MANOVA.
Research question 3 examined if youth diagnosed with BPD NOS, regardless of age of onset, showed poorer family relationships, friend relationships, and school functioning than those with BPD I or BPD II. For this analysis the examiner used a Multivariate Analysis of Covariance (MANCOVA). The independent variables were the three levels of BPD (I, II, NOS). The three dependent variables are important aspects of psychosocial functioning (interpersonal relationships with family, interpersonal relationships with friends, and school work). Prior to running the MANCOVA, the test of assumptions were examined and answered: 1) the test of multivariate normality was examined by computing the skew and kurtosis of each dependent variable of family, friend, and school work scales, 2) the assumption of linearity was examined to see if the DV’s in each group had reasonably balanced distributions, 3) the homeogeneity of covariance was checked for variance across dependent measures, 4) multicollinearity and independence of residuals were examined through the analysis of Mahalanobis Distance values to examine if there were any multivariate outliers on the three variables of
family relationships, friend relationships, and school work. Any demographic variables identified in the pre-analysis would be used as a covariate.

The fourth research question, examined if childhood onset children (<12 years of age) diagnosed with BPD had poorer family relationships, friend relationships, and school functioning than youth diagnosed with Late Onset (>12 years of age) BPD. This analysis examined the main effects between Age of Onset of BPD, which are the independent variables divided into three age groups: 1) Childhood Onset (subjects <12 years of age), 2) Adolescents who report an Early Onset (adolescents who were diagnosed with BPD prior to the age of 12) and 3) Adolescents who were diagnosed at adolescents (more than 12 years of age). The dependent variables are (interpersonal relationships with family members, interpersonal relationships with friends, and School Work. Similar to question 3, the assumptions of normality, linearity, homogeneity of variance used the Box M and Levene’s test, and multicollinearity were examined prior to running the main analysis.
The fifth research question will determine if there was an interaction effect between the Age of Onset and type of Bipolar Disorder (I, II, NOS) for overall psychosocial functioning. The independent variables were divided into two categories, type of Bipolar Disorder (i.e., BPD I, BPD II, BPD NOS) and Age of Onset (i.e., Childhood Onset, Adolescents with Early Onset, Late Onset Adolescents). The dependent variable is overall psychosocial functioning measured by both CGAS and GSA ALIFE. All the same assumptions are applied from questions 1 and 2. The assumption of Homogeneity of Variance is conducted, with the Box M and the Levene's Test for Equality of Variance. After the assumptions are analyzed a Multivariate Analysis of Variance was conducted.

The sixth research question determines if when controlling for ADHD, Anxiety Disorders, and Disruptive Disorders, does BPD NOS show poorer psychosocial functioning in youth than BPD I, II, regardless of age of onset. The pre-analysis examined relationships between Anxiety, ADHD, and Disruptive Disorders in comparison to the dependent variables through t-tests to examine if there is any relationship between them.
T-tests were used to examine the association between mental health disorders and psychosocial functioning (CGAS, GSA ALIFE).

The examiner used a Multivariate Analysis of Covariance for this analysis. The three levels of bipolar disorder (I, II, NOS) were used as the independent variables, the dependent variables were the CGAS and GSA ALIFE. Any demographic variables identified in the pre-analysis would be a covariate. The assumptions of normality, linearity, multicollinearity and outliers were analyzed. homogeneity of regression was applied between the covariates and dependent variables. The assumption of homogeneity of covariance was conducted through the Box M and the Levene's Test to examine variance on the dependent variables. After assumptions were analyzed the main analysis was conducted.
CHAPTER IV

RESULTS

The results section is organized in the following manner. First there is an examination and description of the participant sample. Next data pre-analyses and tests of statistical assumptions were performed to determine the appropriateness of running the main analyses for each research question. Finally, the results of each research question are presented.

Participants

The current study examined data provided from the longitudinal research project, the Course and Outcome of Bipolar Youth (COBY). The COBY study is an ongoing research project funded by the NIMH in July 2000. The analyses for the current study examine intake information for 438 subjects’ ages 7 through 17 years. The average subject age is 12 years and 7 months (+/- 3 years, 2 months) and, the average age of onset of the bipolar disorder is 9 years and 3 months (+/- 3 years, 9 months). Of the 438 subjects the majority of the sample is white(80.95%), 6.1 % are African American, 1.56% are Asian, 10% are Biracial, .26% of the subjects are Native American/Alaskan, and 1.06% are listed as Other racial description. When analyzing the gender,
53.2% of the subjects were male and 46.8% were female. Less than half (41.6%) of the subjects were living with both natural parents and 58.4% were living in another family situation (Axelson, et al., in press). Of the 438 subjects, 255 met criteria for BPD I, 30 met criteria for BPD II, and 153 met criteria for BPD NOS.

Pre-Analyses

Any potential third variables that are significantly associated with primary dependent and independent variables need to be identified prior to running the main analysis (Tabachnick & Fidell, 2001). In order to identify possible covariates the demographic variables Age, Sex (Male or Female), Race (e.g., African American, Caucasian, Mixed/Multi-race), Socioeconomic status (combination of parental education & reliance on public assistance), and Living Situation were correlated with the dependent variables of CGAS, GSA ALIFE, Family and Friend Relationships, and School Work. Results are presented in Table 1. Because Age is a continuous variable and SES is a quasi-interval variable a Pearson correlation analysis was used. Sex, Race, and Living Situation are dichotomous variables, thus a point-biserial correlation was selected for correlating with the continuous dependent variables.
Table 1

Correlation Matrix of Demographics and Dependent Variables

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>SES</th>
<th>Lives With Both Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGAS</td>
<td>-.064</td>
<td>-.044</td>
<td>.054</td>
<td>.024</td>
<td>.037</td>
</tr>
<tr>
<td>GSA ALIFE</td>
<td>.018</td>
<td>-.015</td>
<td>.005</td>
<td>-.049</td>
<td>-.084</td>
</tr>
<tr>
<td>School Work</td>
<td>.015</td>
<td>.057</td>
<td>.030</td>
<td>-.078</td>
<td>-.022</td>
</tr>
<tr>
<td>Family Rel.</td>
<td>.091</td>
<td>.028</td>
<td>.027</td>
<td>-.039</td>
<td>-.063</td>
</tr>
<tr>
<td>Friend Rel.</td>
<td>-.058</td>
<td>-.070</td>
<td>-.023</td>
<td>-.197***</td>
<td>-.043</td>
</tr>
</tbody>
</table>

Note. CGAS=Children’s Global Assessment Scale; GSA ALIFE= Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents. School, Family and Friends on the Subscales of the ALIFE. All correlations are significant at *** p < .001 level (2 tailed).

The correlation matrix shows that SES has a statistically significantly correlation with Friend Relationships, a subscale of GSA ALIFE. Since the GSA ALIFE is considered in both questions 3 and 4 of this study SES will be a covariate in those analyses.
The next pre-analysis examined the relationship between the demographic variables and the independent variable Bipolar Disorder (e.g., I, II, NOS). Results are presented in Table 2. An ANOVA was selected for comparing the continuous variable Age and Bipolar. For this analysis Bipolar Disorder was the independent variable and Age was the dependent variable. A Chi Square Test of Association was selected for comparing Bipolar (e.g., I, II, NOS) with the following categorical demographic variables: Sex (3 x 2), Race (3 x 7), SES (3 x 5), and Living Situation (3 x 2). Socioeconomic status was treated as a polytimous categorical variable to allow for examination of the pattern of SES levels within each Bipolar diagnostic category.
Table 2

Associations Between the Demographic Variables and Bipolar Disorder

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>SES</th>
<th>Lives With Both Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>10.87***</td>
<td>.147</td>
<td>.711</td>
<td>1.304</td>
<td>.149</td>
</tr>
</tbody>
</table>

Note. BPD Total = BPD I, II, NOS. F = Analysis of Variance for Age. χ² = Pearson Chi Squared.

***p < .001

There were no statistically significant associations for Sex, Race, SES and Living Situation and Bipolar. There was a main affect for types of BPD and Age. Thus, for research questions 2 and 4 where Bipolar type is examined, Age will be a covariate. In research questions 1 and 3 Age is not examined with bipolar disorder, thus no further action is required.

The next pre-analysis examined the correlation between the demographic variables to the independent variable of Age of Onset. Results are presented in Table 3. An ANOVA was used to compare Age of Onset to the continuous demographic variable of Age (dependent variable). Using a
chi square analysis, Age of Onset was compared to the following categorical demographic variables: Sex (3 x 2), Race (3 x 7), SES (3 x 5), and Living Situation (3 x 2). For the same reason as the previous pre-analysis, SES was treated as a categorical variable.

Table 3

Associations Between the Demographic Variables and Age of Onset

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>SES</th>
<th>Lives With Both Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>806.927***</td>
<td>20.8***</td>
<td>1.9</td>
<td>.007**</td>
<td>10.9*</td>
</tr>
</tbody>
</table>

Note. \( F \) = Analysis of Variance for Age. \( \chi^2 \) = Pearson Chi Squared.

***p < .001

Table 3 displays statistically significant relationships between Age of Onset and the demographic variables Age, Sex, SES and Living Situation. Hence, the variables of Sex, SES and Living Situation will be used as additional independent variables for questions 2 and 4 where they are examined.
Although Age was identified as having a statistically significant association, Age will not be used as another independent variable because it is logically accounted for by the Age of Onset variable.

The fourth pre-analysis examined the correlation between the Children’s Global Assessment Scale and the Global Social Adjustment from the ALIFE. Both instruments are typical measures of psychosocial functioning used in psychological practice. Thus, it is important to understand their relationship to each other as well as determine the overlap of variance between the scales. It should be noted that higher rating on the CGAS is an indication of good functioning, and in contrast, higher ratings on the GSA ALIFE is indicative of poorer psychosocial functioning. The Pearson’s correlation coefficient was statistically significant ($r = -.529$, $p < .001$). Although statistically significant, the coefficient of determination indicates that 28% of variance is shared between two measures. However, 72% of variance does not overlap, therefore in the interest of a comprehensive understanding of psychosocial functioning both measures (CGAS & GSA ALIFE) will be used in subsequent analyses.
Assumptions and Main Analyses

The first research question examined if youth diagnosed with BPD NOS, regardless of age of onset, evidence poorer psychosocial functioning than those with BPD I or BPD II. For this first research question, a Multivariate Analysis of Variance (MANOVA) was used to examine if the different types of Bipolar disorders (I, II, NOS) were related to psychosocial functioning. The independent variables for this analysis were type of bipolar disorder (e.g., I, II, NOS) and the dependent variables are the overall psychosocial functioning as measured on the Children’s Global Assessment Scale (CGAS) and the Global Social Adjustment from the ALIFE (GSA ALIFE). No significant demographic variables were found in the pre-analysis to be considered in this analysis.

Prior to running the MANOVA, the test of assumptions were examined and answered. First, the Test of Normality was examined by computing the skew and kurtosis of each variable. The results indicate that skew and kurtosis were not < -2 or > 2 (computed as the ratio of the statistic to its standard error), hence there is no violation. Thus, the skew and kurtosis were not extreme and normal for all dependent variables. Second, the assumption of linearity
was examined and all of the DV’s in each group have reasonably balanced distributions, the researcher examined the scatterplots for each pair of DV’s for each group. Through examination of the plots the DV’s were shown to have linear relationships. Third, the homogeneity of variance assumption was tested using the Box M test and it is not significant. Therefore there is equal variance across independent variable groups, and it is recommended to use the Wilk’s Lambda. Also, the Levene’s Test of Equality was not significant on each dependent measure indicating there is equal variance across the two dependent measures. Fourth, Multicollinearity was examined through the analysis of Mahalanobis Distance values. The Mahalanobis Distance was determined to be significant for the two dependent measures of CGAS and GSA ALIFE if it is greater than the critical chi-squared value with degrees of freedom equal to the number of predictors when alpha is set at .001. There were no multivariate outliers on the two variables of CGAS and GSA ALIFE. The outcomes of the assumptions analysis indicate it is appropriate to proceed with the MANOVA procedure. The results are reported in Table 4.
Table 4

Multivariate and Univariate Analysis of Variance for Psychosocial Functioning

<table>
<thead>
<tr>
<th>Source</th>
<th>MANOVA</th>
<th>CGAS</th>
<th>GSA ALIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Bipolar Total</td>
<td>4,806</td>
<td>3.997**</td>
<td>7.32***</td>
</tr>
</tbody>
</table>

*Note. MANOVA = multivariate analysis of variance; ANOVA = univariate analysis of variance. BPD Total = BPD I, II, NOS. CGAS = Children’s Global Assessment Scale; GSA ALIFE = Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents. *p < .05  **p < .01  ***p < .001

Table 4 indicates with the use of Wilk’s criterion, the combined DV’s demonstrated significant differences amongst the three types of Bipolar F (4, 806) = 3.997, p < .01, the value of Wilks’ Lambda is .961. Those who met the criteria for BPD demonstrated significant differences in the severity of their psychosocial functioning; this finding is consistent for both rating scales: CGAS F (2, 404) = 7.32, p < .001 and the GSA ALIFE F (2, 404) = 3.811, p < .05.
Table 5

Tukey Post Hoc Comparisons for type of Bipolar Disorder and Specific Psychosocial Functioning

<table>
<thead>
<tr>
<th>Bipolar Disorder Categories</th>
<th>BPD I (1)</th>
<th>BPD II (2)</th>
<th>BPD NOS (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychosocial Functioning</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>CGAS</td>
<td>53.36</td>
<td>12.2</td>
<td>60.86</td>
</tr>
<tr>
<td>GSA ALIFE</td>
<td>3.34</td>
<td>.895</td>
<td>3.04</td>
</tr>
</tbody>
</table>

Note. The numbers in parentheses in column heads refer to the numbers used for illustrating significant differences in the last column titled “Post hoc.” CGAS= Children’s Global Assessment Scale; GSA ALIFE= Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents.

*p < .05  **p < .01

Table 5 presents means, standard deviations and a Post hoc Tukey test analysis for the three BPD groups (I, II, NOS). Both the GSA ALIFE and the CGAS showed that the Bipolar I group reported more significant severity with their psychosocial functioning when compared to the Bipolar Disorder II or NOS groups.
The second research question examined if youth diagnosed with BPD in childhood (e.g., Childhood Onset < 12 years of age) had poorer psychosocial functioning than youth with a late onset of the disorder (> 12 years of age). A Multivariate Analysis of Variance was used for this analysis. As stated in the pre-analysis, there was a relationship between Age of Onset and Sex, SES, and Living with both parents. Thus, these variables were selected as independent forms of measurement. Subjects were separated into three groups: 1) Childhood Onset, defined as subjects <12 years of age who are diagnosed with BPD, 2) Adolescents who report having an Early Onset and was diagnosed with BPD prior to the age of 12, 3) Adolescent Late Onset, adolescents who were diagnosed with BPD after the age of 12. The dependent variable is psychosocial functioning measured by the Children’s Global Assessment Scale (CGAS) and the Global Social Adjustment from the ALIFE(GSA ALIFE). Results of the evaluation of assumptions of normality, linearity, and multicollinearity were satisfactory as described in question 1. The assumption of homogeneity of variance was conducted, and the Box M test was not significant, therefore the Wilk’s Lamda will be reported in the main analysis. It should be noted that on the CGAS, the
Levene’s test was significant indicating there was unequal variance across the CGAS Current Scale. However, since multivariate homogeneity was established MANOVA should be robust to this concern. After running the first MANOVA with SES, Sex, and Living situation as the other independent variables, SES and Living situation were taken out of the analysis. Further analysis of SES indicated a non-normal distribution, the consequences of which rendered the results uninterpretable. Living with both parents was taken out of the final analysis because it did not account for significant variance during the first run on either the multivariate or univariate analyses. Results of the final MANOVA are presented in Table 6.

Table 6

*Age of Onset and Sex and the Interaction Effects on Psychosocial Functioning*

<table>
<thead>
<tr>
<th>Variable</th>
<th>MANOVA</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
<td>F</td>
<td>CGAS</td>
<td>GSA ALIFE</td>
</tr>
<tr>
<td>Age of Onset</td>
<td>4, 800</td>
<td>1.630</td>
<td>2.129</td>
<td>.400</td>
</tr>
<tr>
<td>SEX</td>
<td>2, 400</td>
<td>.712</td>
<td>1.29</td>
<td>.082</td>
</tr>
<tr>
<td>Age of Onset * Sex</td>
<td>4, 800</td>
<td>2.707*</td>
<td>3.155*</td>
<td>4.641**</td>
</tr>
</tbody>
</table>
Table 6 (continued).

Note. MANOVA = multivariate analysis of variance; ANOVA = univariate analysis of variance. CGAS= Children’s Global Assessment Scale; GSA ALIFE= Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents.

*p < .05  **p < .01

Using Wilk’s criterion, results show a significant interaction between Age of Onset and Sex $F(4, 800) = 2.707$, $p < .05$, with a Wilks’ Lambda value of .973. The univariate analysis of the interaction model identifies statistically significant results on the CGAS $F(2, 401) = 3.155$, $p < .05$ and the GSA ALIFE $F(2, 401) = 4.641$, $p < .01$. This indicates that there is a difference in psychosocial functioning between males and females and their Ages of Onset. Table 7 shows the means, standard deviations, and effect sizes for measures of psychosocial functioning when compared to the variables of Age of Onset and Sex.
Table 7

Means and Standard Deviations of Psychosocial Functioning and Onset of Bipolar Disorder

<table>
<thead>
<tr>
<th>Age of Onset</th>
<th>Child Onset</th>
<th>Adolescent With Early Onset</th>
<th>Adolescent Late Onset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Psychosocial Functioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CGAS</td>
<td>Male</td>
<td>55.04</td>
<td>10.90</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>57.73</td>
<td>12.80</td>
</tr>
<tr>
<td>Effect Size</td>
<td>.266</td>
<td>.354</td>
<td>.229</td>
</tr>
<tr>
<td>GSA A LIFE</td>
<td>Male</td>
<td>3.34</td>
<td>.967</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>3.00</td>
<td>.898</td>
</tr>
<tr>
<td>Effect Size</td>
<td>.364</td>
<td>.131</td>
<td>.345</td>
</tr>
</tbody>
</table>

Note.  M = Mean;  SD = Standard deviation;  CGAS = Children’s Global Assessment Scale;  GSA ALIFE= Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents.
When referencing the effect sizes in table 7, it should be noted that an effect size value of .2 represents a small clinical difference, .5 represents a moderate clinical difference, and .8 represents a large clinical difference between two groups (Cohen, 1988). Examination of effect sizes presented in Table 7 indicates childhood Onset males compared to females presented with a small meaningful difference to have poorer psychosocial functioning on both the CGAS and GSA ALIFE. On the CGAS, Early Onset Adolescent females presented with a small meaningful difference when compared to males having poorer psychosocial functioning. In the Late Onset adolescent group, there was a clinical difference between females having poorer psychosocial functioning than males on both measures.
Figure 1. Age of onset and sex (male and female) on the CGAS current scale.

Figure 1 shows females with a Childhood Onset had better psychosocial functioning than Early Onset Adolescents or Late Onset Adolescents. Whereas in males, adolescents who report an Early Onset had better psychosocial functioning than Childhood Onset or Adolescents with a Late Onset. Overall, Late Onset adolescent females reported worse functioning when compared to males.
Figure 2. Age of onset and sex (male and female) on the ALIFE GSA scale.

Figure 2 shows males and females psychosocial functioning on the GSA ALIFE. Similarly, males with a Childhood Onset report worse psychosocial functioning than adolescent males who report to have an Early Onset or Late Onset. The GSA ALIFE shows Childhood Onset females report having better functioning then Early Onset adolescents or Late Onset adolescent females.
Overall, on the CGAS and GSA ALIFE, the females who report an Early Onset in Adolescents (CGAS $d = .340$; GSA ALIFE $d = .362$) and Late Onset (CGAS $d = .362$; GSA ALIFE $d = .404$) both were identified to have a small clinical difference of having difficulty with their psychosocial functioning when compared to Childhood Onset groups. Whereas, Childhood Onset males (CGAS $d = .223$; GSA ALIFE $d = .309$) were identified to have a small meaningful difference with their psychosocial functioning when compared to Adolescents with an Early Onset. However, there was no meaningful effect size between males with a Childhood Onset and Late Onset.

Research question 3 examined if youth diagnosed with BPD NOS, regardless of age of onset, show poorer family relationships, friend relationships, and school functioning than those with BPD I or BPD II. For this analysis Multivariate Analysis of Covariance (MANCOVA) was used.

The independent variable is BPD type with three levels (I, II, NOS). The three dependent variables are the important aspects of psychosocial functioning (interpersonal relationships with family, interpersonal relationships with friends, and overall school work).
The covariate for this analysis was SES because it co-varied with the Relationship with Friend subscale in the pre-analysis, however it was taken out of the analysis because it violated the assumption normality as mentioned in previous analyses.

Prior to running the MANCOVA, the assumptions were examined. First, the test of normality was examined by computing the skew and kurtosis of each variable. The results indicate that skew and kurtosis were not < -2 or > 2 for the relationship with friend and family relationships scales, hence there were no violations on these two scales. The skew and kurtosis were normal for these two dependent variables. However, the School Work scale demonstrated to have high kurtosis at 6.68 and violated the assumption of normality. For if the kurtosis ratio is higher than 2.0 it is said to violate normality. Second, the assumption of linearity was examined and again the dependent variables of Family Relationships and Relationships with Friends have reasonably balanced distributions and 80.95% a linear relationship. However, again the dependent variable School Work demonstrated to have an unreasonably balanced distribution in the scatterplot and violated the assumption. Third, the homeogenity of variance assumption
was examined through the Box M test and it is not significant, therefore there is equal variance across independent variable groups, and it is recommended to use the Wilk’s Lambda. Also, the Levene’s Test of Equality was not significant on each dependent measure indicating there is equal variance across groups for the dependent measures. Fourth, multicollinearity was examined through the analysis of Mahalanobis Distance values. The Mahalanobis Distance was determined to be statistically significant for the three dependent measures of Relationships with Friends, Relationships with Family, and School Work if it is greater than the critical chi-squared value with degrees of freedom equal to the number of predictors when alpha is equal to .001. There were no multivariate outliers on the two variables of Relationship with Friend and Family scales, however the School Work variable identified to have significant outliers and therefore violated the assumption. Fifth, the School Work variable caused significant problems in the tests of assumptions. Due to the variables of School Work and SES being dropped from the analysis, the outcome of the assumptions analysis indicates it is appropriate to proceed with the MANOVA procedure. The results are reported in Table 8.
Table 8

Multivariate and Univariate Analyses of Variance for Overall Psychosocial Functioning Subscales

<table>
<thead>
<tr>
<th>MANOVA</th>
<th>Friends</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>df</td>
<td>$F$</td>
<td>$F$</td>
</tr>
<tr>
<td>Bipolar Total</td>
<td>4, 812</td>
<td>.357</td>
</tr>
</tbody>
</table>

Note. MANOVA = multivariate analysis of variance; ANOVA = univariate analysis of variance. Subscales of Psychosocial Functioning = Friends, Family.

*p < .05  **p < .01  ***p < .001

Examination of the Wilk’s criterion indicates there is no difference in the levels of BPD for the combined DV’s, $F(4, 812) = .357, p < .05$, Wilks’ Lambda is .996. Table 8 shows that there is no difference between the type of bipolar disorder and the effects measured on two subscales of psychosocial functioning; Friends $F(2, 407) = .661, p > .05$; Family $F(2, 407) = .061, p > .05$. Specifically, there is no difference for BPD I, II, NOS and difficulties with psychosocial functioning in the areas of interaction with friends and family relationships, they all demonstrate equal difficulties.
Table 9

Means and Standard Deviations Subscales of Psychosocial Functioning and Type of Bipolar Disorder

<table>
<thead>
<tr>
<th>Bipolar Disorders</th>
<th>BPD I (1)</th>
<th>BPD II (2)</th>
<th>BPD NOS (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Psychosocial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>2.49</td>
<td>1.24</td>
<td>2.17</td>
</tr>
<tr>
<td>Family</td>
<td>2.87</td>
<td>1.10</td>
<td>2.82</td>
</tr>
</tbody>
</table>

Note. The numbers in parentheses in column heads refer to the numbers used for illustrating significant differences in the last column titled “Post hoc.”

Table 9 shows there were no significant differences among the three bipolar groups and the two levels of psychosocial functioning. However, this researcher also examined the effect sizes across the bipolar groups. There was a small meaningful difference between the BPD I group demonstrating poorer relationships with friends than the BPD II group ($d = .225$). An effect size equal to or above .20 demonstrates a small statistical difference between groups.
The fourth research question, examined if youth diagnosed with BPD that had a Childhood Onset (<12 years of age) have poorer family relationships, friend relationships, and school functioning than youth diagnosed with Late Onset (>12 years of age) BPD. This analysis examined the main effect of Age of Onset of BPD, which is the independent variable divided into three age groups: 1) Childhood Onset (subjects <12 years of age), 2) Adolescents who report an Early Onset (adolescents who were diagnosed with BPD prior to the age of 12) and 3) Adolescents who were diagnosed at adolescences (more than 12 years of age). The pre-analysis indicated a correlation between Sex, SES, and Living situation with Age of Onset, thus each will be used as independent variables. Also, SES correlated with the Relationship with Friend Scale, hence it will be used as a covariate. However, as identified in the previous analyses SES and Living situation were taken out of the analysis. SES was taken out of the analysis because it violated the assumption of normality. Living with both parents was taken out of the analysis because it did not account for significant variance during the first run on either the multivariate or univariate analyses.
As a result of previous assumptions in question 3, the School Work scale violated the assumptions and was subsequently taken out of the main analysis. The dependent variables are interpersonal relationships with family members and interpersonal relationships with friends.

Results of the evaluation of assumptions of normality, linearity, and multicollinearity were satisfactory as compared to question 3. The assumption of homogeneity of variance was conducted, and the Box M test was not significant, therefore the Wilk’s Lamda was reported in the main analysis. The Levene's Test for Equality of Variance examined the equal variance on the dependent variables, the ALIFE Friend Relationship scale identified to be significant, thus there is not variance across dependent measures. MANOVA is robust to minor violations in Levene’s test. The results are reported in Table 10.
Table 10

Age of Onset, SEX and the Interaction Effects on Psychosocial Functioning

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Family</th>
<th></th>
<th>Friends</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ANOVA</td>
<td>MANOVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of Onset</td>
<td>4, 806</td>
<td>2.144</td>
<td>3.264*</td>
<td>1.255</td>
<td></td>
</tr>
<tr>
<td>SEX</td>
<td>2, 403</td>
<td>.009</td>
<td>.008</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Age of Onset</td>
<td>4, 806</td>
<td>3.665*</td>
<td></td>
<td></td>
<td>6.535**</td>
</tr>
<tr>
<td>* Sex</td>
<td></td>
<td></td>
<td>.201</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. MANOVA = multivariate analysis of variance; ANOVA = univariate analysis of variance

*p < .05  **p < .01

With using the Wilk’s criterion there is a significant interaction between Age of Onset and Sex $F(4, 806) = 3.665, p < .05$ and the effects on combined psychosocial functioning dependent variables. The Wilks’ Lambda value is .965. Examination of the univariate interaction model indicates a statistically significant interaction between Age of Onset and Sex for the Relationship with Friend measure $F(2, 404) = 6.535, p < .01$. 
Table 11

Psychosocial Functioning and Effects of Onset of Bipolar Disorder

| Age of Onset | Family | | | | | | | | | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Child Onset  | 2.78   | 1.00   | 3.03   | 1.03   | 2.85   | 1.14   | 2 > 1 * |
| (<12 years)  | Male   | Female | Total  |        |        |        |        |        |        |        |        |        |        |
| Adolescent   | 2.77   | .923   | 3.10   | 1.03   | 2.75   | 1.06   |        |        |        |        |        |        |        |
| with Early   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Onset        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| (<12 years)  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| (1)          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Adolescent   | 2.77   | .972   | 3.06   | 1.03   | 2.78   | 1.09   |        |        |        |        |        |        |        |
| with Late    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Onset        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| (>12 years)  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| (2)          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Psychosocial |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Functioning  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| M            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| SD           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Friend       | 2.68   | 1.27   | 2.52   | 1.11   | 1.97   | .919   |        |        |        |        |        |        |        |
| Male         |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Female       | 2.22   | 1.03   | 2.43   | 1.05   | 2.54   | 1.06   |        |        |        |        |        |        |        |
| Total        | 2.51   | 1.21   | 2.48   | 1.08   | 2.32   | 1.04   | 1 = 2 = 3 |

Note. The numbers in parentheses in column heads refer to the numbers used for illustrating significant differences in the last column titled "Post hoc."

Table 11 shows the means, standard deviations and a Tukey post hoc test analysis to examine the differences amongst the three age groups on family relationships and relationships with friends.
The post hoc test identifies a significant difference with the Early Onset Adolescents identifying poorer relationships with family when compared to the Childhood Onset group. To specifically examine the interaction between Age of Onset and Sex and the difference in functioning, refer to figures 3, 4, 5, 6.

![Graph showing Age of onset and sex (male and female) on the ALIFE friend scale.](image)

*Figure 3. Age of onset and sex (male and female) on the ALIFE friend scale.*
Figure 3 plots the functioning of males and females on the ALIFE Friend Measure. In females, the Childhood Onset group had better relationships with friends when compared to Adolescents who report having an Early Onset or Adolescents with a Late Onset. Whereas, Childhood Onset males had the poorest relationships with friends compared to Early Onset and Late Onset Adolescents.

The analysis was furthered by calculating effect sizes to examine the differences between the female and male groups. Overall, Childhood Onset males had a small clinical differences with poorer relationships with friends when compared to the Childhood Onset females ($d = .397$). Specifically, in females, the reported Early Onset($d = .201$) and Late Onset adolescents ($d = .306$) demonstrated to have a small statistical difference with poorer relationships with friends than females with a Childhood Onset. Whereas, in males, the Childhood Onset($d = .640$) and adolescents who report an Early Onset($d = .539$) demonstrated a moderate differences with poorer relationships with friends when compared to Late Onset adolescents.
Figure 4. Age of onset and the ALIFE friend scale.

Figure 4 shows Adolescents with an Early Onset and Childhood Onset had poorer relationships with friends than Late Onset Adolescents.
Figure 5. Age of onset and sex (male and female) on the ALIFE family scale.

Figure 5 plots the Family functioning for males and females. Both female and male adolescents who report Early Onsets have the poorest family functioning. Effect sizes were calculated and it was found that similarly in females, Early Onset Adolescents had poorer relationships with family members by demonstrating a small meaningful difference to Childhood Onset ($d = .337$) and Late Onset Adolescents ($d = .334$).
In males, adolescents who report an Early Onset ($d = .246$) demonstrated to have a small statistical difference with poorer family relationships when compared to the Childhood Onset group.

*Figure 6. Age of onset and family functioning on the ALIFE family scale.*
Figure 6 is plotted to specifically examine the Age of Onset and differences in family functioning, because it was found to be significant on the univariate analysis. This plot displays that Adolescents with an Early Onset have the poorest family relationships when compared to youth with a Childhood and Late Onset.

The fifth research question was to examine if there is an interaction effect between the Age of Onset and type of Bipolar Disorder (I, II, NOS) for overall psychosocial functioning. The independent variables were divided into two categories, type of Bipolar Disorder (BPD I, BPD II, BPD NOS) and Age of Onset, Childhood Onset (subjects <12 years of age), Adolescents who report having an Early Onset (adolescents who were diagnosed with BPD prior to the age of 12) and Late Onset Adolescents diagnosed at adolescents (more than 12 years of age). The dependent variable is overall psychosocial functioning, both CGAS and GSA ALIFE. All the same assumptions are applied as for questions 1 and 2. The assumption of homogeneity of variance was conducted, and the Box M test was not significant, therefore the Wilk’s Lamda will be reported in the main analysis.
The Levene's Test for Equality of Variance examined the equal variance on the dependent variables, and it was not significant and demonstrated to have equal variances across the two dependent variables. A Multivariate Analysis of Variance was conducted. The results are reported in Table 12.

Table 12

Multivariate and Univariate Analysis of Variance for Psychosocial Functioning

<table>
<thead>
<tr>
<th>Source</th>
<th>MANOVA</th>
<th></th>
<th>CGAS</th>
<th></th>
<th>GSA ALIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Bipolar Total</td>
<td>4, 794</td>
<td>2.994*</td>
<td>5.369**</td>
<td>3.440*</td>
<td></td>
</tr>
<tr>
<td>Age of Onset</td>
<td>4 794</td>
<td>.999</td>
<td>.416</td>
<td>1.802</td>
<td></td>
</tr>
<tr>
<td>BPD * Age of Onset</td>
<td>8, 794</td>
<td>1.569</td>
<td>1.480</td>
<td>1.524</td>
<td></td>
</tr>
</tbody>
</table>

Note. MANOVA = multivariate analysis of variance; ANOVA = univariate analysis of variance.
*p < .05    **p < .01
Using the Wilk’s criterion, Age of Onset and Bipolar Disorder do not show an interaction $F(8, 794) = 1.569, p < .05$. However, as expected from previous analyses, there was a significant main effect for BPD and psychosocial functioning $F(4, 794) = 2.944, p < .05$; this finding was evidenced on both rating scales of the CGAS $F(2, 398) = 5.36, p < .01$ and the GSA ALIFE $F(2, 398) = 3.440, p < .05$.

Table 13

Means Scores and Standard Deviations for Measures of Psychosocial Functioning and Effects of Type of Bipolar Disorder and Age of Onset

<table>
<thead>
<tr>
<th>Psychosocial Functioning</th>
<th>CGAS</th>
<th>GSA ALIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPD I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Onset (&lt;12 years)</td>
<td>54.1</td>
<td>11.6</td>
</tr>
<tr>
<td>Adolescent with Early Onset (&lt;12 years)</td>
<td>54.61</td>
<td>10.3</td>
</tr>
<tr>
<td>Adolescent With Late Onset (&gt;12 years)</td>
<td>50.88</td>
<td>14.59</td>
</tr>
<tr>
<td>BPD II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Onset (&lt;12 years)</td>
<td>61.60</td>
<td>8.90</td>
</tr>
</tbody>
</table>
Table 13 (continued).

<table>
<thead>
<tr>
<th></th>
<th>CGAS</th>
<th>GSA ALIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Early Onset (&lt;12 years)</td>
<td>56.10</td>
<td>9.63</td>
</tr>
<tr>
<td>Adolescent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Late Onset (&gt;12 years)</td>
<td>64.23</td>
<td>14.0</td>
</tr>
<tr>
<td>BPD NOS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Onset (&lt;12 years)</td>
<td>57.79</td>
<td>11.4</td>
</tr>
<tr>
<td>Adolescent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Early Onset (&lt;12 years)</td>
<td>57.29</td>
<td>10.2</td>
</tr>
<tr>
<td>Adolescent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Late Onset (&gt;12 years)</td>
<td>52.35</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Table 13 examined the means and standard deviations for the two measures of psychosocial functioning (CGAS and GSA ALIFE) and the type of bipolar disorder (I, II, NOS) as well as the Age of Onset (three levels). To further examine the interaction between Age of Onset and Bipolar Disorder, scores are plotted into two graphs.
Figure 7 presents Age of Onset, Bipolar Disorder and psychosocial functioning when using the CGAS. The Childhood Onset BPD I group and Adolescents who report having an Early Onset had better functioning than Adolescents with a Late Onset.
The Adolescent BPD II group reported to have an Early Onset had poorer psychosocial functioning than Childhood Onset and Late Onset Adolescents. Lastly, Late Onset BPD NOS group have poorer psychosocial functioning than both early onset groups.

Figure 8. Age of onset and BPD (I, II, NOS) and the ALIFE GSA scale.

Figure 8 reports the psychosocial functioning on the GSA ALIFE. The Childhood Onset BPD I group has poorer functioning than any other group. The Childhood Onset BPD
II group showed better psychosocial functioning than the Adolescents who report having an Early Onset and Late Onset Adolescents. Lastly, Childhood Onset BPD NOS group displayed slightly better functioning then Adolescents who reported having an Early Onset and Late Onset Adolescents.

The sixth research question examined, when controlling for ADHD, Anxiety Disorders, Disruptive Disorders, if BPD NOS show poorer psychosocial functioning in youth than BPD I, II, regardless of age of onset. A pre-analysis was conducted to determine which variables should be entered into the final equation. The pre-analysis, is presented here, separate from previous pre-analyses because these covariates only apply to this question. The pre-analysis examined relationships between Anxiety, ADHD, and Disruptive Disorders in comparison to the dependent variables through t-tests to examine if there is any relationship between them. T-tests were used to examine the association between mental health disorders and psychosocial functioning (CGAS, GSA ALIFE).
### Table 14

*Psychosocial Functioning and Comorbid Mental Health Disorders*

<table>
<thead>
<tr>
<th></th>
<th>CGAS M</th>
<th>CGAS SD</th>
<th>CGAS T</th>
<th>ALIFE M</th>
<th>ALIFE SD</th>
<th>ALIFE T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>55.39</td>
<td>10.2</td>
<td>-1.02**</td>
<td>3.17</td>
<td>.916</td>
<td>1.19</td>
</tr>
<tr>
<td>ADHD</td>
<td>53.75</td>
<td>10.7</td>
<td>.485</td>
<td>3.25</td>
<td>.732</td>
<td>-.081</td>
</tr>
<tr>
<td>Disruptive</td>
<td>53.78</td>
<td>11.1</td>
<td>1.416*</td>
<td>3.41</td>
<td>.898</td>
<td>-3.81*</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.

Table 14 shows that Anxiety and Disruptive Disorders have a significant relationship to the CGAS. Also in Table 14 Disruptive Disorders has a significant relationship to the GSA ALIFE.

The examiner used a Multivariate Analysis of Covariance for this analysis. Because Anxiety and Disruptive Disorders are associated to the dependent variables, they were used as covariates for this analysis. The three levels of bipolar disorder (I, II, NOS) was used as the independent variable, the dependent variables were the CGAS and GSA ALIFE. All the same assumptions of normality, linearity, multicollinearity and outliers were completed in question 1 and can be applied to this analysis. Homogeneity of regression was applied between the
covariates and dependent variables, the covariates were judged to be adequately homogeneous for covariance analysis. The assumption of homogeneity of covariance was conducted, and the Box M test was not significant, therefore the Wilk's Lambda will be reported in the main analysis. The Levene's Test for Equality of Variance examined equal variances on the dependent variables, it was not significant and thus demonstrated to have equal variances across the two dependent variables. The results are reported in table 15.

Table 15
Multivariate and Analysis of Variance for Psychosocial Functioning

<table>
<thead>
<tr>
<th>Source</th>
<th>MANOVA</th>
<th>ANOVA</th>
<th>CGAS</th>
<th>GSA</th>
<th>ALIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2, 401</td>
<td>.493</td>
<td>.497</td>
<td>.932</td>
<td></td>
</tr>
<tr>
<td>Disruptive Dis.</td>
<td>2, 401</td>
<td>7.640***</td>
<td>.900</td>
<td>13.978***</td>
<td></td>
</tr>
<tr>
<td>Bipolar Total</td>
<td>4, 802</td>
<td>3.785**</td>
<td>6.757***</td>
<td>3.346*</td>
<td></td>
</tr>
</tbody>
</table>

Note. MANOVA = multivariate analysis of variance; ANOVA = univariate 
$p < .05$ **$p < .01$ ***$p < .001$
Using Wilk’s criterion, the combined DV’s demonstrated significant differences amongst the three types of Bipolar Disorder $F(4, 802) = 3.785, p < .01$ when controlling for other mental health variables. The BPD Total demonstrated difference among BPD levels with their psychosocial functioning; this finding was true on both rating scales of the CGAS $F(2, 404) = 6.757, p < .001$ and the GSA ALIFE $F(2, 404) = 3.346, p < .05$. Additionally, the Disruptive Disorder Category with the combined DV’s (CGAS, GSA ALIFE) showed a significant difference $F(2, 401) = 7.640, p < .001$ with their psychosocial functioning. Specifically, GSA ALIFE measured youth with different levels of Disruptive Disorders $F(2, 404) = 13.978, p < .001$ to have significant differences with psychosocial functioning. The results from the MANCOVA indicated that both Disruptive Disorders and Bipolar Disorders evidence significant impairment with their psychosocial functioning. BPD I demonstrated poorer functioning than BPD II and NOS on both measures of psychosocial functioning.

Due to the Bipolar Disorder and the Disruptive Disorder groups both demonstrating significance on the GSA ALIFE, an Analysis of Variance (ANOVA) was conducted to examine if there was an interaction between the two
disorders and if it had an effect on their psychosocial functioning. For this analysis the independent variables were the BPD Total and Disruptive disorder groups, the dependent variable were the GSA ALIFE. The results indicated that there is no interaction between the two variables BPD Total and Disruptive Disorders $F (2, 438) = 780, p < .01$. This suggests that the diagnosis of Bipolar Disorder and Disruptive Disorder have independent effects on psychosocial functioning.

Table 16

Demographic Variables, Type of BPD, Age of Onset and Psychosocial Functioning

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>All Subjects</th>
<th>BPD I</th>
<th>BPD II</th>
<th>BPD NOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>438</td>
<td>255</td>
<td>30</td>
<td>153</td>
</tr>
<tr>
<td>Age (years)</td>
<td>12.7 +/- 3.2</td>
<td>12.9 +/- 3.2</td>
<td>14.6 +/- 2.8</td>
<td>11.9 +/- 3.3</td>
</tr>
<tr>
<td>% Male</td>
<td>53.2%</td>
<td>51.8%</td>
<td>40.0%</td>
<td>58.2%</td>
</tr>
<tr>
<td>% Female</td>
<td>46.8%</td>
<td>48.2%</td>
<td>60.0%</td>
<td>41.8%</td>
</tr>
<tr>
<td>% White</td>
<td>81.7%</td>
<td>80.8%</td>
<td>86.7%</td>
<td>82.4%</td>
</tr>
<tr>
<td>% Non-White</td>
<td>18.3%</td>
<td>19.2%</td>
<td>13.3%</td>
<td>17.6%</td>
</tr>
<tr>
<td>Living with Both Parents</td>
<td>41.6%</td>
<td>38.0%</td>
<td>53.3%</td>
<td>45.1%</td>
</tr>
<tr>
<td>Living in Other Situation</td>
<td>58.4%</td>
<td>62.0%</td>
<td>46.7%</td>
<td>54.9%</td>
</tr>
<tr>
<td>Age of Onset</td>
<td>9.3 +/- 3.9</td>
<td>9.5 +/- 4.0</td>
<td>11.2 +/- 3.4</td>
<td>8.7 +/- 3.5</td>
</tr>
</tbody>
</table>
Table 16 (continued).

<table>
<thead>
<tr>
<th>Type of Bipolar Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>All Subjects</td>
</tr>
<tr>
<td>Demographics</td>
</tr>
<tr>
<td>CGAS</td>
</tr>
<tr>
<td>ALIFE GSA</td>
</tr>
<tr>
<td>Family Rel.</td>
</tr>
<tr>
<td>Friend Rel.</td>
</tr>
</tbody>
</table>

Note. BPD = Bipolar Disorder I, Bipolar Disorder II, Bipolar Disorder Not Otherwise Specified. Age = Average age of the subjects; Gender = Male and Female; Race = White and Non-White; Living with Both Parents or Living in Other Situation; Age of Onset; CGAS = Children’s Global Assessment Scale Current; GSA ALIFE = Global Social Adjustment of Longitudinal Interval Follow-up Evaluation Adolescents. Family and Friends Relationships = Subscales of the ALIFE.

Table 16 reviews the overall results of the demographic variables (gender, race, living situation) in comparison to the type of BPD, Age of Onset, and the overall impact it has on child’s psychosocial functioning (CGAS, ALIFE GSA, Family and Friend subscale).
CHAPTER V
CONCLUSION

In this section implications of the results found in chapter 4 are discussed. Significant findings are compared to interpretations presented in previous research. Also, limitations and recommendations for future research are offered.

Research Findings

Youth diagnosed with Bipolar Disorder evidence significant difficulty in overall psychosocial functioning. This finding is consistent across measures (i.e., CGAS & GSA ALIFE). Youth diagnosed with BPD I had significantly worse functioning than those with BPD II and BPD NOS. While question 1 was not fully supported, the BPD NOS group did have psychosocial functioning somewhat comparable to the BPD I group; there was a small effect size between the two variables on both the CGAS ($d = .294$) and GSA ALIFE ($d = .262$).

Although the sample showed impairment in psychosocial functioning, the difficulties did not uniformly fall into categories for any of the groups. That is, when examining family and friend relationships, there were no significant differences between BPD I, BPD II, and/or BPD NOS groups.
School Functioning was taken out of the analysis because it violated the assumptions of linearity and normality. Therefore the information examined in question 3 (i.e., family, friend & school functioning) does not provide any specific information about these groups for use in diagnosis or treatment considerations.

When controlling for other mental health disorders, bipolar disorder alone affects psychosocial functioning. Similar to results in question 1, the BPD I group demonstrated worse overall functioning as compared to the BPD II and/or BPD NOS groups on both measures. Also, the BPD NOS group was again most similar to the BPD I group. Interestingly, in the pre-analyses there was a high correlation between the CGAS and GSA ALIFE, and all of the BPD findings were consistent across measures. However, the findings were not the same for the clinical samples. For example, the ADHD group did not show psychosocial impairment on either the CGAS or the GSA ALIFE although they meet diagnostic criteria for the disorder. Also, the Anxiety group only evidenced difficulties on the GSA ALIFE. The Disruptive Disorders did show significant psychosocial impairment on both the CGAS and GSA ALIFE. Further analyses found that BPD and Disruptive Disorders had independent
effects on psychosocial functioning. This finding is important because it shows that both measures (i.e., CGAS & GSA ALIFE) are reliable independent measures of psychosocial functioning for children who are diagnosed with BPD. Both measures can be used in clinics and treatment centers as a form of measurement to identify the psychosocial impairments of individuals diagnosed with BPD. Researchers working with ADHD or Anxiety clinical samples should consider these results.

Age of Onset effects psychosocial functioning differently for males and females (question 2). On both measures, Childhood Onset males demonstrated a small but significant difference in their functioning when compared to females. Specifically, early Onset males show poorer psychosocial functioning than females. Late Onset females demonstrated a small but significant difference in psychosocial functioning when compared to males. Specifically, late Onset females show poorer psychosocial functioning than males.
As a group female psychosocial functioning is significantly worse into adolescents, for both early and late onset, when compared to childhood functioning. Decreases in functioning are small but clinically meaningful. As a group early onset males who were adolescents did show a small but clinically important increase in functioning. However, there was not a difference between males with a Childhood Onset and Late Onset. These findings are important not only in providing information to clinicians around maintaining intervention supports for young females although their functioning may not be as severe as male’s with BPD, but because they provide information that can inform how prevalence rates are understood for BPD. There were no significant findings between the Age of Onset and type of Bipolar Disorder and the effects on a youth’s psychosocial functioning (question 5).
There is a significant interaction between the Age of Onset, Sex, and the psychosocial variable relationships with friends. Early Onset males have small clinical, but statistically significant, difference in their relationships with friends when compared to the Childhood Onset females. Specifically, males reported poorer relationships than the females.

As a group, Childhood Onset and Early Onset Adolescents males demonstrate a moderate clinical, yet statistically significant, difference in their relationships with friends when compared to Late Onset adolescents. Specifically, both early onset groups had poorer relationships.

As a group, Early and Late Onset adolescent females demonstrated small clinical, yet statistically significant, difference in their relationships with friends. Specifically, the adolescents reported poorer relationships with friend than the Childhood Onset females. These results provide support for including friendship development as a targeted intervention for both groups.
Sustained intervention across childhood and adolescent development is important for males. Female interventions around friendship should not be overlooked in adolescence regardless of childhood functioning as this group tends to show a decrease in functioning.

There was also a significant finding with the Age of Onset, and Family Relationships. Both male and female Early Onset Adolescents report the poorest family functioning. In males, Early Onset adolescents demonstrate a small clinical, but statistically significant, difference in family relationships. Early Onset adolescents report poorer relationships when compared to the Childhood Onset group. In females, Early Onset Adolescents demonstrate a small clinical, but statistically significant, difference in relationships with family members. Early Onset Adolescents have poorer family relationships when compared to Childhood Onset and Late Onset Adolescents. The chronic nature of the illness shows the most negative impact on families.
Results Compared with Previous Findings

The current study improved upon both Geller et al., (2000; 2002; 2004) and Lewinsohn et al., (1995; 2000) findings by increasing the sample size and diversity (e.g., age and SES) of youth diagnosed with bipolar disorders, including specifying the BPD diagnostic categories BPD I (n=255), BPD II (n=30), and BPD NOS (n=153) to examine psychosocial functioning. That is, a primary limitation of the Lewinsohn et al., (1995) research is that there were only 18 youth diagnosed with Bipolar Disorder (mean age of 11.75). Most subjects were in high school and very few were diagnosed before the age of 10. They used the DSM-III-R to diagnose the subjects and reported the following: 2 subjects met criteria for BPD I, 5 met criteria for BPD II, and 11 met criteria for BPD NOS. In addition to the 18 with a formal bipolar diagnosis, the rest of the 97 subjects presented with symptoms of bipolar disorder such as elevated, expansive, or irritable mood, but did not meet criteria for the disorder. These 97 were labeled with subsyndromal symptoms. Thus, a substantial improvement of the current study is the increase in total subject pool including a group of younger children.
Lewinsohn et al. 2000 found that adolescents diagnosed with BPD and subsyndromal symptoms both exhibited significantly greater impairment with psychosocial functioning and were more likely to utilize mental health services. Lewinsohn and researchers (2000) collapsed the BPD group (BPD I = 4; BPD II = 11), and compared them to 48 subjects with subsyndromal symptoms they defined as: a distinct period of abnormally and persistently elevated, expansive, or irritable mood, in addition to having one or more manic symptoms, but never having met criteria for BPD. Similar to the current results, they found when controlling for other mental health disorders (Anxiety, ADHD, Disruptive Disorders) Bipolar Disorder significantly impacts psychosocial functioning. A second consistency is that the current BPD NOS groups showed significant psychosocial difficulty that is comparable to Lewinsohn and colleagues (2000) subsyndromal group who also reported significant psychosocial impairments. This is important because the impairment was similar to those who met full criteria for the BPD diagnosis.
Thus, bipolar symptoms that are less in severity or number as compared to diagnostic threshold still impair psychosocial functioning. Third, impairment in family and friend relationships is a similar to finding the Lewinsohn and colleagues (1995) study.

In Geller and colleagues (2000) study they found the CGAS score for the prepubertal BPD group fall into the Serious range (CGAS = 43.3). Although they did not report male and female differences as a group they had more males. Also, the current study had more males (N = 217) than females (N = 190), so when considering the significant difference between the Age of Onset of males and females in relationship to their psychosocial functioning, female adolescents (i.e., Early & Late Onset in Adolescence) reported significant and clinically meaningful differences in their psychosocial functioning. Thus, the influence of puberty, a significant correlate to age, and psychosocial functioning warrants further investigation.

Geller and colleagues (2000; 2002) found that prepubertal BPD cases had significantly greater impairment on items that assessed maternal-child warmth, maternal-child and paternal-child tension, and peer relationships, and in their 2004 follow-up study they also found youth
with low maternal warmth and expressed emotion from the child and mother. Both poor family and friendships were found in the current study. Specifically, in this study, the forth question found that Adolescents (males and females) who report an Early Onset have poorer family relationships then Childhood Onset and Late Onset groups. Also, the current study identified Early Onset Adolescents and Childhood Onset youth report worse relationships with friends. Specifically, males with a Childhood Onset and Adolescents who report an Early Onset demonstrated a moderate statistically significant finding for poorer relationships with friends when compared to Late Onset adolescents. This finding was different for females, the Adolescents who reported an Early Onset and Late Onset Adolescents had more difficulty with their relationships with friends.

There are several possible interpretations of the finding that the Early Onset adolescents presented with poorer family and friends functioning. One explanation is that chronicity and cyclical suffering BPD symptoms impacts children and families in a manner that is difficult to recover and thus benefit from developmental gains. Second, the stress of a disorder is layered on top of the stress of
adolescents and thus increasing in impact. Also, it may be that the impact of the disorder changes the course of development in some significant manner so that adequate coping is inconsistent with the developmental trajectory. Although that is not yet known, results from the female group are consistent with Kovac and colleagues (1984) research, which found that the younger the child is diagnosed with depression the more likely the youth will have difficulty with psychosocial functioning and coping with the illness. Also, in research with BPD, Carlson and researchers (2002) found the earlier the onset of BPD the poorer results with the course and outcome of the disorder.

Limitations

There are several limitations to consider with the current findings. First these results only considered subjects at intake and did not track functioning over time. Thus, initial functioning may change over the course of development regardless of intervention. Results need to be interpreted with this caution. The next step in documenting psychosocial functioning should follow these children longitudinally to assist in understanding how bipolar disorder effects their psychosocial functioning for the purpose of informing treatment protocols.
The second limitation is the limited number of children diagnosed with BPD II. There was a smaller number of youth at intake compared to the other two groups and this BPD II group was older and mostly female. Until prevalence of BPD II is well understood, it is unknown if the current sample is typical.

The third limitation was the diagnostic information and interview provided to the COBY study at intake from the subjects’ and their caregivers included some retrospective recall. Although this is a constraint for many studies, information should be viewed with that caution.

Fourth limitation, although the sample size provided good power for statistical group comparisons, the strength of the effect for small and/or rare differences are difficult to detect with large groups like BPD I and BPD NOS.

Fifth, all of the subjects in the study were diagnosed with bipolar disorder, and were recruited from clinical facilities such as clinics and mental health hospitals. These children represent the most severe groups. Therefore, results are only applicable to a clinical sample.
Finally, the intake process is ongoing and the timing of interviews can be substantially different across subjects and across their experience of their disorder. Although retrospective accounts of functioning are required, their current functioning may have impacted how they reported their history. Every effort is made to cross validate information, yet timing can impact their description of symptoms. Again, it would be helpful to follow these subjects over time to examine how BPD has an impact on their everyday functioning.

Recommendation for Future Research

In the future, tracking the psychosocial implications from the onset of BPD over time is an important area of future research. Continuing to compare Childhood Onset, with Early and Late Onset adolescents over time will provide important information about the course of the disorder and psychosocial changes if any. Further research on the separate BPD categories (i.e., I, II, NOS) is warranted. Examining and clarifying the definitions of these groups is an important contribution for future researchers.
Treatment implications should be described for these groups. Also, the impact of treatment over the course of development as it is related to psychosocial functioning should be considered.
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