

Impairment in the achievement domain in bipolar spectrum disorders: role of behavioral approach system hypersensitivity and impulsivity

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Aim. Research indicates that bipolar disorder is characterized by both high levels of impairment and high levels of achievement. A critical, and yet largely unexamined question, is: what psychological mechanisms promote high accomplishment (and low impairment) among bipolar spectrum individuals? The aim of this study was to examine this question. The Authors also conceptually explore how the answer to this question can enhance the development of intervention and prevention strategies for adolescents with a bipolar spectrum condition.

Methods. Academic transcript data were obtained for 120 college students who had either a bipolar spectrum disorder (N=54) or no major psychopathology (N=66).

Results. Bipolar spectrum individuals obtained a lower cumulative grade point average (GPA, $t=-2.9$, $P=0.005$) and dropped more classes ($t=2.1$, $P<0.04$) than normal controls. The findings also have relevance to the behavioral approach system (BAS) dysregulation theory of bipolar disorder, as well as research on impulsivity among bipolar individuals. Specifically, follow-up analyses revealed that bipolar individuals exhibiting a combination of high BAS drive and low impulsivity earned higher GPAs than the remaining bipolar individuals. Thus, high BAS sensitivity, when paired with low impulsivity, may not be impairing and may

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contribute to the high achievement sometimes observed among bipolar individuals.

Conclusion. Such information is important for the development of prevention and intervention programs designed adolescents that lower risk for bipolar impairment without decreasing achievement.

Key words: Bipolar disorder, diagnosis - Bipolar disorder, prevention and control - Adolescent.

Bipolar disorder often creates significant impairment such as erratic work history and substance abuse.¹⁻⁴ Compared to patients with serious medical illnesses such as multiple sclerosis and end stage renal disease, bipolar patients have more compromised interpersonal relationships, worse marital adjustment, and lower incomes.^{5, 6} In addition, bipolar disorder is associated with poorer academic achievement.⁷⁻⁹ Moreover, bipolar disorder leads to suicide in almost 1 out of every 5 diagnosed individuals.¹⁰ Indeed, this illness has been ranked the sixth leading cause of disability among both physical and psychiatric disorders worldwide.¹¹

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Paradoxically, bipolar disorder has also been associated with high levels of accomplishment.¹² For example, Weissman and Myers report that in urban areas of the US, a history of mania was more common among individuals of higher social class.¹³ This pattern was opposite to that of other major psychiatric disorders.¹⁴ Individuals with bipolar disorder are more likely to be professionals than other patients,¹⁵ and have higher lifetime educational attainment compared to both normative levels¹⁶ and patients with neurotic disorders.¹⁷ There have also been reports of high levels of creativity among bipolar spectrum individuals.^{18, 19} Much of this work has been spearheaded by Jamison, when she published an extensive list of well-known authors and artists who are believed to have suffered from mania.²⁰

Given that bipolar disorder is clearly characterized by high levels of both impairment and achievement, a critical, and yet relatively unexamined question, is: what psychological mechanisms or traits are associated with greater impairment (and lower achievement) among bipolar spectrum individuals? The answer to this question has important treatment implications, particularly for children and adolescents. The majority of research on psychosocial interventions for bipolar disorder has focused on adults. However, epidemiological findings²¹⁻²³ suggest that the first peak in rates of bipolar disorder is between ages 15-19. This transition from adolescence to young adulthood has been referred to as an age of risk or hazard period²³ during which bipolar conditions consolidate and sometimes progress to a more severe condition. If psychological traits can be identified that are associated with increased impairment among bipolar individuals, these traits can be identified and targeted during, or ideally, prior to, this age of risk. The Authors review research on two psychological mechanisms that may be particularly relevant to the study of bipolar impairment and achievement.

Behavioral approach system hypersensitivity and impulsivity

In the last two decades, the behavioral approach system (BAS)^{24, 25} and the behavioral

inhibition system (BIS),²⁵ as well as comparable approach and withdrawal systems,²⁶ have been related to many forms of psychopathology.²⁷ The BAS is hypothesized to facilitate goal-seeking in response to incentives and cues for reward, whereas the BIS is proposed to promote inhibition in response to cues of threat and punishment.^{24, 25}

According to the BAS hypersensitivity model of bipolar disorder,^{24, 28} vulnerability to bipolar disorder may be reflected in an overly sensitive BAS that is hyper-reactive to relevant cues. A hyper-responsive BAS can lead to excessive BAS activation in response to relevant events involving themes of reward incentive, goal-striving and attainment, and anger evocation. This excessive BAS activation in vulnerable individuals is hypothesized to lead to hypomanic/manic symptoms of euphoria, irritability, optimism, excessive self-confidence and goal-seeking, decreased need for sleep, and distractibility.^{24, 28} Alternatively, excessive BAS deactivation or shutdown of behavioral approach/engagement in response to BAS deactivation-relevant events such as definite failure and non-attainment of goals should lead to depressive symptoms such as sadness, anhedonia, hopelessness, and psychomotor retardation.^{24, 28}

Results are consistent with the model: compared with relevant control groups, individuals with bipolar I disorder²⁹ and people prone to hypomanic symptoms³⁰ showed elevated scores on a self-report measure of BAS sensitivity.³¹ Alloy *et al.* reported that high self-reported BAS sensitivity prospectively predicted a greater likelihood and shorter time to onset of bipolar episodes over a 3.5 year follow-up period among individuals with a bipolar II and/or cyclothymia diagnosis.³² The authors also reported a strong positive relationship between BAS sensitivity and trait measures of impulsivity.³³

Clinically, since the beginnings of descriptive psychiatry it has been known that manic episodes are associated with high state levels of impulsivity.³⁴ It is only recently, however, that research indicates a relationship between trait levels of impulsivity and bipolar impairment. For example, Kwapil *et al.* reported that among individuals with high

TABLE I.—*Descriptive information on participants.*

	Bipolar participants			Nonbipolar participants			P
	%	M	SD	%	M	SD	
Age at screening interview	—	20.4	1.6	—	20.6	1.4	NS
Caucasian	88.9	—	—	93.9	—	—	NS
Female	48.1	—	—	53.0	—	—	NS
Bipolar II diagnosis	79.6	—	—	0.0	—	—	0.001
Cyclothymia diagnosis	20.4	—	—	0.0	—	—	0.001
GBI-D at screening	—	23.7	8.0	—	1.7	2.5	0.001
GBI-HB at screening	—	17.4	3.5	—	2.9	3.6	0.001
Age at first depressive episode	—	14.9	3.9	—	—	—	—
Age at first hypomanic episode	—	12.5	4.4	—	—	—	—
Age at first hypomanic or depressive episode	—	11.4	4.0	—	—	—	—
BAS Total	—	40.3	5.1	—	38.9	4.3	NS
BAS drive	—	11.4	2.4	—	10.6	2.04	0.06
BAS fun seeking	—	12.4	2.3	—	11.6	2.0	0.04
BAS reward responsiveness	—	16.5	2.0	—	16.7	1.8	NS
BIS	—	20.18	4.1	—	20.8	3.2	NS
Impulsive-nonconformity	—	19.9	9.2	—	8.6	5.7	0.001

hypomanic personality characteristics, elevated trait impulsivity predicted poorer overall adjustment and higher rates of arrest.³⁵ High trait impulsivity has also been associated with increased substance abuse³⁶ and suicidality.³⁷ High levels of impulsivity have been proposed as a core feature of bipolar disorder³⁸ and it is suggested that this feature may be particularly prevalent in the explosive temper and irritability that so often accompany child and adolescent bipolar disorder.³⁹

The present study

The present study was designed to extend the existing literature on impairment and accomplishment in bipolar disorder using a large non-clinical sample of students with bipolar spectrum disorders (bipolar II, cyclothymia, bipolar NOS) and demographically matched normal controls. Academic transcripts were obtained for all participants. The aim of this study was threefold:

1) to examine the extent to which a bipolar spectrum diagnosis is associated with heightened impairment or accomplishment in the domain of academic achievement (*i.e.* GPA, dropped classes, etc.). The analysis was focused on academic achievement given research indicating that life events in this do-

main are particularly salient triggers for bipolar episodes.⁴⁰ Mood lability associated with bipolar disorder was predicted to be contraindicated to maintaining a stable GPA; thus, bipolar spectrum individuals would display greater impairment in the achievement domain relevant to controls.

2) To examine the extent to which trait BAS sensitivity and impulsivity moderated academic impairment/accomplishment in the achievement domain.

3) To explore conceptually ways in which understanding the relationship between BAS sensitivity, impulsivity, and academic performance can inform interventions for child and adolescent bipolar disorder.

Materials and methods

Subjects

Table I provides descriptive information regarding participants. At the time of recruitment, all participants were undergraduate students at the University of Wisconsin-Madison (UW), age ranging 18-24 years. Participants were recruited from February 1999 to August 2001. They were selected by a two-stage screening procedure: in stage I, 9 995 UW students filled out the general be-

havior inventory (GBI) ⁴¹ which is designed to identify individuals with bipolar spectrum conditions. A subset of participants who met the cut off criteria for the bipolar spectrum (hypomania-biphasic [HB] score >13 and depression [D] score >11) or for the absence of affective psychopathology (HB<13 and D<11), as specified by Depue *et al.*⁴¹ proceeded to stage II. In stage II, 712 participants were administered an expanded-schedule for affective disorders and schizophrenia-lifetime diagnostic interview (exp-SADS-L⁴²). Based on the exp-SADS-L interview and the GBI, two groups of individuals were identified: 1) individuals who met GBI cut off criteria for the bipolar spectrum and the DSM-IV ⁴³ criteria for either cyclothymic disorder, bipolar II disorder, or both cyclothymic and bipolar II disorder; and 2) individuals who met both GBI cut off criteria for absence of affective psychopathology and DSM-IV criteria for no major affective psychopathology (control group). Individuals from these two groups composed the final sample of 120 participants (59 men, 61 women). Given their focus on the "soft" bipolar conditions, the Authors excluded anyone with current or past DSM-IV diagnosis of bipolar I disorder. The bipolar spectrum group consisted of 54 individuals (11 [20%] met criteria for cyclothymic disorder, 43 [80%] met criteria for bipolar II disorder). The control group consisted of 66 individuals with no past or current psychopathology at the time of the stage II exp-SADS-L. Among the bipolar spectrum group, the average age of first depressive episode was 14.92 (standard deviation [SD]=3.87), the average age of first hypomanic/cyclothymic episode was 12.49 (SD=4.41), and the average age of first depressive or hypomanic/cyclothymic episode was 11.41 (SD=4.02). Bipolar participants did not differ from control participants on ethnicity, gender, or age at the date of the SADS-L interview. However, as expected, bipolar participants did score significantly higher than control individuals on the GBI-D (23.7 *vs* 1.7, $P<0.01$) and the GBI-HB (17.4 *vs* 2.9, $P<0.01$) at the time of initial screening. Individuals were excluded from the current study also if they were not a student at UW for at least 2 years.

Procedure

All participants completed the BIS/BAS scales and the Impulsive Non-Conformity Scale (INS), as well as other measures not relevant to the current study, approximately 1.7 years following the exp-SADS-L interview. An average of 2.3 years following the exp-SADS-L interview, participants were asked whether they would provide consent for the UW's laboratory to obtain a copy of their academic transcripts from the UW registrar. If participants were living in Madison (Wisconsin) at the time of this request, they were asked to provide consent in person. If they were living outside of the Madison area, they were mailed a consent form to review and sign. Seventy-five percent of participants provided consent to release their transcripts. There were no significant differences on relevant descriptive variables (*e.g.* diagnostic status, age, ethnicity) between participants who agreed to release a copy of their transcripts and those who did not agree.

Measures

ACADEMIC TRANSCRIPTS

For participants who provided consent, academic transcripts were obtained from the UW registrar's office. Analyses of impairment/achievement focused on two academic variables: cumulative GPA, number of dropped classes, and whether a student withdrew from school at any point during their time at UW.

BIS/BAS SCALES

The BIS/BAS scale ³¹ assesses self-reported sensitivity of the BAS and the BIS. It consists of the BIS scale and the BAS scale, composed of three subscales, drive, fun seeking, and reward responsiveness. The drive subscale consists of 4 items that assess persistence in reward pursuit and has an α coefficient of 0.76 and test-retest reliability of 0.66.³¹ The fun seeking subscale consists of 4 items that assess willingness to approach rewards and novel stimuli and has an α coefficient of 0.66 and test-retest reliability of 0.69.³¹ The reward responsiveness subscale consists of 5

items that assess positive responses to reward and has an α coefficient of 0.73 and test-retest reliability of 0.59.³¹ The BIS scale contains 7 items that assess sensitivity to the possibility of punishment; it has a coefficient alpha of 0.74 and test-retest reliability of 0.66.³¹

GBI

GBI⁴¹ was developed to serve as an efficient first-stage case identification procedure to identify individuals with bipolar spectrum conditions who are at high risk for developing a more severe bipolar condition. It was used in the current proposal to identify potential bipolar and control individuals to invite for the stage II diagnostic screening interview. The GBI contains 73 items that assess core bipolar experiences and their intensity, duration, and frequency on two subscales: D and HB items combined. The authors used the case-scoring method recommended by Depue *et al.*⁴¹ to identify potential bipolar and control participants. The GBI has an α of 0.90-0.96, test-retest reliability of 0.71-0.74, adequate sensitivity (0.78) and high specificity (0.99).⁴¹

EXP-SADS-L

EXP-SADS-L⁴² is a semistructured diagnostic interview that assesses current and lifetime history of Axis I disorders. Aided by consultations with experts on bipolar disorders, the Authors expanded the SADS-L interview to enable greater accuracy in diagnosis of bipolar conditions, including: 1) expansion of the number of items and improvements in the probes in the depression, mania/hypomania, and cyclothymia sections; 2) additional probes to assess the precise number of days participants felt depressed or euphoric/irritable and for what percentage of waking hours of each day they felt depressed or euphoric/irritable in the depression or mania/hypomania sections, respectively; 3) improvements of the probes in the depression, mania/hypomania, and cyclothymic sections based on incorporating aspects of Depue's behavioral variability interview;⁴⁴ 4) addition of items in the cy-

clothymia section that assess the frequency, duration, and switch rapidity of depression and hypomanic periods; 5) addition of probes to examine the extent to which changes in participants' behavior were noticeable to people in their lives. An inter-rater reliability study based on 105 jointly rated exp-SADS-L interviews yielded Kappas >0.96 for bipolar spectrum diagnoses. The exp-SADS-L interviews were conducted by extensively trained project interviewers, blind to participants' GBI scores. Exp-SADS-L consensus DSM-IV diagnoses were determined by a three-tiered consensual standardized review procedure involving project interviewers, senior diagnosticians (*i.e.* Dr. Abramson), and the expert diagnostic consultant, Dr. Gruenberg. Project interviewers completed an intensive interviewer training program for the administration of the exp-SADS-L interviews consisting of about 200 hours of reading and didactic instruction.

INS

Impulsivity was indexed using Chapman *et al.*'s INS.⁴⁵ The INS consists of 51 true or false items that tap impulsive behavior. It has demonstrated adequate internal consistency ($\alpha=0.79-0.84$)^{33, 45} and 6 week test-retest reliability ($r=0.84$).⁴⁵ In addition, individuals who scored high on the INS were more likely to endorse antisocial, psychotic, depressive, and manic/hypomanic symptoms than a control group.⁴⁵ Moreover, individuals high in BAS sensitivity exhibited higher INS scores than individuals with moderate BAS sensitivity.³³

Results

A multivariate analysis of variance (MANOVA) revealed that bipolar individuals, as compared to control individuals, had higher impulsivity, BAS fun seeking, and higher BAS drive, Wilks $\lambda=0.61$, $F(6, 114)=14.35$, $P<0.001$. (Table I). Further, bipolar individuals had a lower cumulative GPA ($M=3.18$; $SD=0.48$) than control individuals ($M=3.42$, $SD=0.40$), $F(1, 117)=6.65$, $P=0.01$ and more dropped

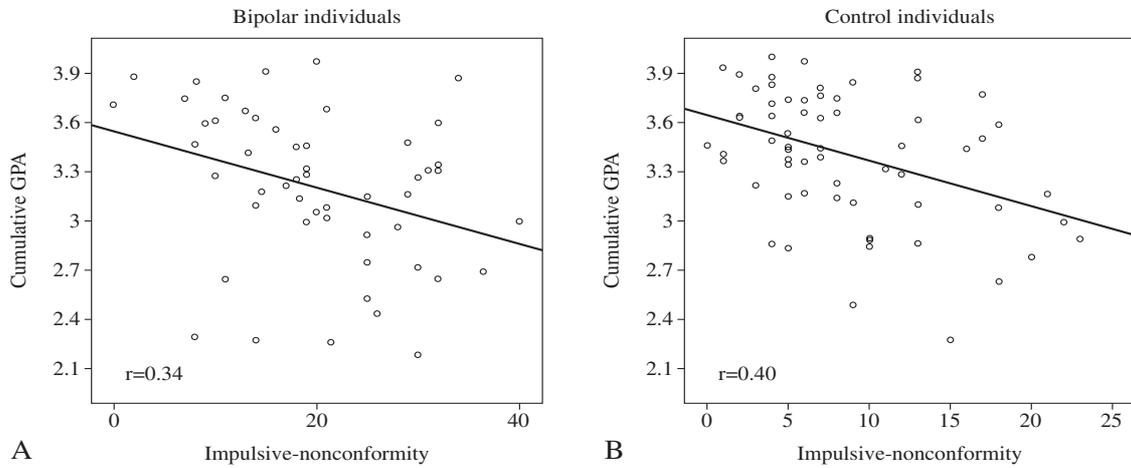


Figure 1.—The Relationship between Cumulative GPA and Impulsive-Nonconformity.

classes ($M=1.83$, $SD=2.97$) than control individuals ($M=0.88$, 1.70), $F(1, 117)=4.93$, $P=0.03$. Given that analyses involving number of dropped classes may be influenced by how long a participant has been a student, we reconsidered this latter analysis controlling for the number of semesters a person was enrolled. The effect remained significant, $F(1, 117)=4.85$, $P=0.03$. Next, participants were classified based on whether they had ever withdrawn from school, either for a semester or permanently (1 = at least one withdrawal, 0 = no withdrawal). Logistic regression analyses revealed that bipolar individuals were more likely to withdraw from school relative to control individuals, $\beta=1.48$, $Wald \chi^2(1)=5.93$, $P=0.015$. Finally, bipolar individuals classified as having at least one severe hypomanic episode had a lower cumulative GPA ($M=3.0$, $SD=0.53$) relative to bipolar spectrum individuals with no history of severe hypomanic episodes ($M=3.32$, $SD=0.38$).

Moderation analyses

The next set of analyses examined the extent to which individual differences in BAS sensitivity and impulsivity moderated the academic performance of participants. No relationship was observed between BAS sensitivity (BAS total, as well as the subscale scores) or BIS sensitivity, and any of the indices of academic achievement. There was a

strong relationship, however, between impulsivity and academic performance. Among both bipolar individuals ($B=0.34$), $t(51)=2.57$, $P=0.01$ ($r=0.34$) and control individuals ($B=-0.40$), $t(63)=3.5$, $P=0.001$ ($r=0.402$), high impulsivity was associated with worse academic performance (Figure 1).

Among bipolar spectrum individuals, there was an interaction between BAS-drive subscale scores and impulsivity in predicting cumulative GPA ($B=-1.61$), $t(49)=2.43$, $P=0.02$. To decompose this interaction, a median split was performed on BAS drive and impulsive non-conformity scores, and bipolar participants were classified into one of four groups: high BAS drive/high impulsivity; high BAS drive/low impulsivity; low BAS drive/high impulsivity; low BAS drive/low impulsivity. As it can be observed in Figure 2, bipolar individuals exhibiting a combination of high BAS drive and low impulsivity earned higher cumulative GPAs than the remaining bipolar individuals. Simple main effects analyses were conducted revealing that this difference in GPA was significant for the comparison of the high BAS drive/low impulsivity group ($M=3.45$, $SD=0.46$) to the high BAS drive/high impulsivity group ($M=3.07$, $SD=0.45$), $t(27)=-2.19$, $P=0.038$. The difference in GPA was marginally significant for the comparison of the high BAS drive/low impulsivity group to both the low BAS Drive/high impulsivity

group ($M=3.1, SD=0.50$) $t(23)=-1.96, P=0.06$, and the low BAS drive/low impulsivity group ($M=3.1, SD=0.47$) $t(26)=-1.95, P=0.06$. The interaction between BAS drive and impulsivity was non-significant for control participants, suggesting that this relationship is specific to bipolar individuals. Finally, none of the other BAS subscales interacted with impulsiveness/nonconformity, suggesting that this relationship is specific to BAS Drive.

Discussion

The objectives of the current study were three-fold:

1) to examine the extent to which a bipolar spectrum diagnosis (bipolar II disorder and/or cyclothymia) was associated with impairment or accomplishment in the domain of academic achievement. In line with prediction, bipolar individuals had a lower cumulative GPA, more dropped classes, and were more likely to withdraw from school relative to control individuals. Further bipolar individuals classified as having at least one severe hypomanic episode had a lower cumulative GPA relative to bipolar spectrum individuals with no history of severe hypomanic episodes.

2) To examine whether self-reported BAS sensitivity and/or impulsivity are meaningful psychological mechanisms for helping us understand impairment or accomplishment in the achievement domain among bipolar spectrum individuals. For both bipolar and control individuals, high levels of self-reported impulsivity were associated with greater academic impairment. However, for bipolar spectrum individuals, this relationship was contingent on their level of self-reported BAS sensitivity (drive subscale). Specifically, bipolar individuals exhibiting a combination of high BAS drive and low impulsivity were protected from impairment in the achievement domain, and performed comparable to control individuals.

3) To explore conceptually ways in which understanding the relationship between BAS sensitivity, impulsivity, and academic per-

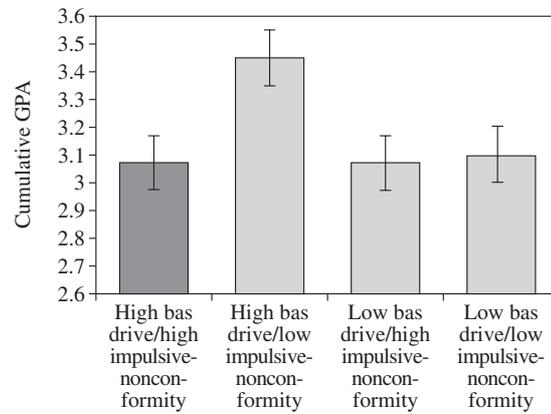


Figure 2.—BAS-Drive, Impulsive-Nonconformity, and Cumulative GPA among Bipolar Spectrum Individuals.

formance can inform interventions for child and adolescent bipolar disorder.

Research indicates that bipolar disorder is characterized by high levels of both impairment and accomplishment.^{11, 12} Results from the current study identify a psychological profile (high BAS drive and low impulsivity) that may help us understand which bipolar spectrum individuals are particularly prone to the high accomplishment end of the spectrum. Identifying this profile has a number of important therapeutic implications for bipolar disorder, particularly for adolescents. As outlined earlier in this study, the transition from adolescence to young adulthood has been referred to as an age of risk or hazard period during which bipolar conditions consolidate and sometimes progress into a more severe condition.²³ Adolescence is also a period in which individuals have their first exposure to a number of highly impulsive stimuli such as alcohol, drugs, and sexual activity. To the extent that clinicians are able to target trait impulsive tendencies in adolescents with a bipolar spectrum condition, they may help these individuals navigate this hazard period in a way that minimizes impairment and maximizes accomplishment. Therapists can employ distancing or delaying tactics to help their bipolar patients manage impulsive tendencies or behaviors, which may be particularly strong during manic prodromes. These strategies enable the patients to step back or distance themselves from the situa-

tion and delay the acting out of their excessively optimistic plans.⁴⁶ During this delay period, the objective is for the patient to assess the value and feasibility of these plans. Newman *et al.* proposed a 48 hours before acting rule in which the patients are encouraged to wait two full days and get two full nights of sleep before acting on any new plan or idea.⁴⁷ Patients are encouraged to think to themselves, "If it is a good idea now, it will be a good idea then." Therapists can also utilize a two-person feedback rule, where patients are taught to test out any new plan or idea with at least two trusted advisors.⁴⁷ Thus, family members should be incorporated into distancing and delay tactics as a sounding board. Family members may also need to remind bipolar individuals of the importance of delay tactics, as these individuals may be resistant to disengage from impulsive and excessive reward seeking behaviors.

Data from the current study, however, suggest that managing impulsivity is only one variable in the equation, and that it is the combination of high BAS drive and low impulsivity that protected bipolar individuals from academic impairment. This finding is intriguing given research suggesting that bipolar individuals score higher on BAS sensitivity^{29, 30} and achievement motivation¹² than control individuals, and that these heightened scores predict a more severe bipolar course.^{33, 48} The present study suggests the possibility that, in the context of low impulsivity, high BAS drive sensitivity may actually serve as a protective mechanism in the achievement domain. Further research is needed to more fully examine this hypothesis.

Managing bipolar impairment during adolescence in the academic/achievement domain is critical for a number of reasons. First, it can help preserve academic and professional opportunities that could be threatened by poor grades, dropped classes, and withdrawing from school. Second, it may have implications for the course of bipolar disorder; that is, whether or not an individual progresses to a more severe bipolar condition (*i.e.* from bipolar II to bipolar I disorder). As

speculated by Akiskal, "what is transmitted in bipolar disorder are these affectively dysregulated temperaments and the progression to full-blown bipolar illness is due to the environment".⁴⁹ There is growing appreciation among clinicians and researchers that the environmental variables that affect the course of bipolar disorder are often self-generated life events. This stress-generation effect indicates that depressed or bipolar individuals often experience an increased rate of life events that are dependent on their behavior.^{50, 51} Given research suggesting that bipolar disorder is characterized by high drive/incentive motivation, ambitious goal-setting, and perfectionism in the achievement domain,¹² academic failure/impairment during adolescence may serve as a particularly potent trigger for bipolar episodes. By identifying psychological mechanisms/traits that can minimize such impairment, researchers and clinicians can ideally help manage bipolar disorder during both the hazard period of adolescence and life more generally.

Riassunto

Disturbo della comunicazione nei bipolarismi: ruolo del sistema di approccio comportamentale per l'ipersensibilità e l'impulsività

Obiettivo. La ricerca suggerisce che il disturbo bipolare è caratterizzato sia da elevati livelli di deterioramento che da alti livelli di comunicazione. Una domanda critica, ancora largamente senza risposte, è: quali meccanismi psicologici promuovono un'elevata realizzazione (e un basso deterioramento) nei soggetti con disturbo bipolare? Lo scopo dello studio è stato quello di trovare una risposta a questa domanda. Si è inoltre esplorato concettualmente come la risposta a questa domanda possa favorire lo sviluppo di strategie di intervento e di prevenzione per gli adolescenti con disturbi bipolari.

Metodi. I dati sono stati ottenuti valutando 120 studenti del college che presentavano o un disturbo bipolare (N.=54) o esenti da psicopatologie maggiori (N.=66).

Risultati. I soggetti con disturbo bipolare hanno ottenuto un minor punteggio *grade point average* (GPA) cumulativo ($t=-2,9$; $P=0,005$) e si è registrato un più alto numero di bocciature ($t=2,1$; $P<0,04$) rispetto ai controlli normali. I nostri dati hanno anche rilevanza per quanto riguarda la teoria disregolatoria (*behavioral approach system dysregulation theory*, BAS)

del disturbo bipolare, così come per la ricerca sull'impulsività nei soggetti con disturbo bipolare. Specificamente, le analisi del follow-up hanno evidenziato che i soggetti con disturbo bipolare che esibiscono una combinazione tra elevato BAS drive e bassa impulsività hanno raggiunto GPA maggiori rispetto ai restanti soggetti con disturbo bipolare. Di conseguenza, un'alta sensibilità BAS, quando accoppiata a bassa impulsività, può non essere peggiorativa e può contribuire ad un'elevata comunicazione talvolta osservata nei soggetti con disturbo bipolare.

Conclusioni. Tale informazione è importante per lo sviluppo di programmi di prevenzione e di intervento destinati agli adolescenti a minor rischio di deterioramento bipolare senza diminuire la comunicazione.

Parole chiave: Disturbo bipolare - Adolescenti - Impulsività.

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