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Assessment and Treatment of Bipolar Spectrum Disorders in Emerging Adulthood: Applying the Behavioral Approach System Hypersensitivity Model

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Bipolar disorder is associated with a host of negative physical and interpersonal outcomes including suicide. Emerging adulthood is an age of risk for the onset of bipolar spectrum disorders (BSDs) and there has been increased effort to focus on early identification and subsequent intervention for BSDs during this developmental period. Recent research on the Behavioral Approach System (BAS) hypersensitivity model of bipolar disorder may have implications for the assessment and treatment of BSDs in emerging adulthood. We summarize relevant findings on the BAS hypersensitivity model that support the use of reward sensitivity in the early identification of BSDs and suggest evidence-based strategies for clinical work with emerging adults with BSDs.

> My classwork during these galvanized periods seemed straightforward, and I found examinations, laboratory work, and papers almost absurdly easy during the weeks that the high-flying times would last. I would also become immersed in a variety of political and social causes. . . . But then as night inevitably goes after the day, my mood would crash, and my mind again would grind to a halt. I lost all interest in my schoolwork, friends, reading, wandering, and daydreaming.
>
> —Kay Redfield Jamison (1995, p. 43)

Entering her freshman year at a large public university, Kim has always done well in school and plans to become a pediatrician. Her first semester schedule consists largely of premed courses, but hoping to appear well-rounded to medical schools, she has decided to major in political science as she enjoys volunteering for local causes. She has always wanted to try crew and signs up for classes; soon, she gets positive feedback from her crew instructor and she decides to try out for the university team. To become more competitive, Kim starts working out, and as she gets positive feedback from others for her more toned physique, her workouts become daily. She finds herself running out of available hours—however, she plans to cut back on sleep during the week and catch up by sleeping in on the weekends.

Around October, Kim receives an A on a paper and plans to receive an A on her next paper to impress her instructor so she can ask for a letter of recommendation from him. On the same day the next paper is due, she has a chemistry exam, but Kim decides that she can "pull an all-nighter" the day before. The next day, she is shocked to see an almost failing grade on the chemistry exam and she is sad for the rest of the week. Kim tries to call friends from high school but they are difficult to reach and preoccupied with their own schedules. She has attended parties with friends from crew, but she doesn't feel close to anyone at school as most of her time has been spent on classes, crew, and working out. Kim finally decides to drop her chemistry class and worries about what this means for her medical career. She starts sleeping in more, missing class in the morning, finds it difficult to concentrate during finals, and ends up barely passing all her classes. Feeling worse about herself, she has trouble getting out of bed and doesn't feel like anything is fun. Kim questions if she can finish college; when she thinks of the next 4 years of classes, she wonders what it would be like to go to sleep and never wake up. She has had symptoms of depression before, but for the first time she might be experiencing a depressive episode. Why is this intelligent, high-achieving young woman striving for her goals one month and clinically depressed the following month and, most importantly, how can such a result be prevented?

Bipolar disorder is characterized by extreme swings of mood (euphoria or irritability vs. sadness), behavior (excessive goal striving, high energy, increased talkativeness vs. anhedonia, fatigue, and lethargy), and cognition (grandiosity, racing thoughts vs. worthlessness) occurring within the same individual. Individuals with bipolar disorder have high rates of suicidal ideation and attempts (Jamison, 2000) and often experience negative physical

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and interpersonal outcomes including high rates of divorce and substance abuse (Alloy, Bender, et al., 2009; Angst, Stassen, Clayton, & Angst, 2002), inconsistent work history, and poor academic achievement (Nusslock, Alloy, Abramson, Harmon-Jones, & Hogan, 2008).

Including cyclothymic disorder, bipolar II disorder, and bipolar I disorder, bipolar spectrum disorders (BSDs) affect approximately 4.5–6% of the general U.S. population (Judd & Akiskal, 2003; Merikangas et al., 2007). From the time an individual first seeks treatment, it requires 6–10 years on average to receive an accurate diagnosis of bipolar disorder (Lish, Dime-Meenan, Whybrow, Price, & Hirschfeld, 1994; Morselli & Elgie, 2003; Scott, 2011). Timely diagnosis is important as one third of the suicide attempts by those with bipolar disorder take place in the first year after illness onset and the likelihood of substance abuse, episode recurrence and relapse, and switching directly from an episode of mania to depression (or vice versa) is high during the early course of bipolar disorder (Salvatore et al., 2007).

This article summarizes some of the recent evidence for the role of the Behavioral Approach System (BAS) or reward hypersensitivity model in BSDs and discusses the implications of this work for the early identification and treatment of bipolar disorder. Although not all individuals with high levels of BAS sensitivity will develop BSDs and not all those diagnosed with BSDs demonstrate BAS hyperactivity, knowledge gained from the BAS/reward hypersensitivity model may prove useful in the assessment of individuals at risk for BSDs during emerging adulthood. Similarly, intervention strategies informed by the BAS model employed during this developmental period may improve the lifetime course of bipolar disorder.

The Assessment of Bipolar Disorder in Emerging Adulthood

Although many individuals experience earlier onset of bipolar disorder (e.g., Perlis et al., 2004), emerging adulthood (usually conceived of as the developmental period between ages 18 and 25; see Arnett, 2000) is another major age of risk for onset of bipolar disorder (Bellivier, Golmard, Henry, Leboyer, & Schurhoff, 2001) and few individuals experience episode onset after the age of 24 (Lewinsohn, Seeley, & Klein, 2003). Emerging adulthood is a period of considerable transition and significant life decisions (Shulman & Nurmi, 2010) and frequent hypo(manic) and/or depressive episodes may make it difficult for an emerging adult to successfully complete developmental tasks. Intervening early in the course of bipolar disorder may allow the emerging adult to finish school or occupational training or to establish a stable partnership; these may be assets in later recurrences of the disorder (Leopold et al., 2012).

Given that the onset of unipolar depression is also frequent during emerging adulthood (Morris, McGrath, Goldman, & Rottenberg, 2014), it may be difficult to determine whether a depressive episode in emerging adulthood represents a unipolar or bipolar presentation. In adolescents and emerging adults, depressive symptoms and episodes are much more common than their (hypo)manic counterparts (Duffy & Carlson, 2013); individuals with bipolar disorder may experience depressive episodes only (i.e., without diagnosed [hypo]mania for 5 years or more; Goldberg, Harrow, & Whiteside, 2001), and so may be misdiagnosed with unipolar depression (Leopold et al., 2012). As individuals may be poor historians of past experiences of symptoms and episodes (Perlis, 2005), ultimately the onus is on the clinician to conduct a thorough history taking including a comprehensive assessment of past mood symptoms and episodes. One tactic may be to include the report of another informant, such as a family member (Perlis, 2005), but this may prove more difficult to manage if an emerging adult is living outside of the home. An assessment profile that reliably predicts which emerging adults with depression are likely to develop bipolar disorder would aid the timely identification of emerging adults at greatest risk of developing a BSD.

The BAS Hypersensitivity Model of BSDs

According to the BAS or reward hypersensitivity model of BSDs, an overly sensitive BAS or reward system may be involved in the generation of both hypomanic or manic (hereafter referred to as "[hypo]manic" to designate both hypomania and mania) and depressive symptoms (Alloy & Abramson, 2010; Depue & Iacono, 1989; Urošević, Abramson, Harmon-Jones, & Alloy, 2008). The BAS has been associated with a frontostriatal neural circuit sensitive to the rewarding properties of stimuli (Depue & Collins, 1999; Haber & Knutson, 2010). Activation of the BAS and this frontostriatal circuit results in goal-directed behavior when in the presence of goal-related or rewarding stimuli (Carver & White 1994; Depue & Iacono, 1989). Stimuli activating the BAS motivational state can be either internal (e.g., reward expectancy) or external (e.g., tangible reward cue).

According to the BAS hypersensitivity model, an overly sensitive BAS leads to hyperresponsiveness to reward-relevant cues and disproportionate goal-directed behavior that leads to (hypo)manic symptomatology (e.g., euphoria; increased energy, decreased need for sleep) characteristic of bipolar disorder (Alloy & Abramson, 2010; Alloy, Nusslock, & Boland, 2015; Depue & Iacono, 1989; Urošević et al., 2008). Excessive BAS activation also can lead to (hypo)manic anger or irritability when goal striving is frustrated (Carver, 2004; Harmon-Jones & Sigelman, 2001). As well as the onset of (hypo)mania, the BAS hypersensitivity model can account for the occurrence of depressive

episodes in BSD. When an individual with a hypersensitive BAS experiences losses or failures to attain goals that cannot be remediated, this leads to an excessive deactivation of the approach system, which results in increased depressive symptoms such as sadness, loss of interest, and decreased energy (Alloy & Abramson, 2010; Alloy et al., 2015; Depue & Iacono, 1989; Urošević et al., 2008). The model distinguishes between trait hypersensitivity of the reward system to reward-relevant cues (the vulnerability) and state levels of activation or deactivation of the system, which are the more proximal precursors of (hypo)manic versus depressive symptoms or episodes (Alloy et al., 2015). Although there are some state effects on BAS sensitivity, considerable evidence from self-report, behavioral, and neural indices suggests that reward hypersensitivity is also a mood-state independent trait of BSDs (see Alloy, Olino, Freed, & Nusslock, in press, for a review).

Although multiple mechanisms are likely involved in the association between changes in BAS activation and development of mood symptoms, one way in which BAS activation and deactivation may lead to (hypo)manic and depressive symptoms, respectively, is via disruption of social routines and, in turn, circadian rhythms (Alloy et al., 2015). The brain's reward and circadian systems show bidirectional influences on each other (Alloy et al., 2015). For example, when a reward-hypersensitive emerging adult experiences BAS activating events, he or she should exhibit excessively high goal striving, appetitive motivation, and response initiation, tendencies incongruent with maintaining regular daily social rhythms. He or she may work excessively long hours and neglect normal social routines, which in turn may disrupt circadian rhythms and trigger mood episodes. Consistent with this hypothesis, Boland et al. (2015) found that BAS-hypersensitive emerging adults experienced more social rhythm disruption following the occurrence of BAS activating and deactivating life events, which in turn predicted subsequent increases in (hypo)manic and depressive symptoms, respectively.

Findings From the BAS Hypersensitivity Model of BSD

Although not all individuals with an overly sensitive BAS will develop BSD, longitudinal studies support the predictive validity of the BAS hypersensitivity model of BSD. For example, higher levels of BAS sensitivity predicted shorter time to onset of (hypo)manic episodes for those with bipolar II and cyclothymic disorders (Alloy et al., 2008) as well as increases in manic symptoms for individuals with bipolar I (Meyer, Johnson, & Winters, 2001). Additionally, BAS-relevant events (i.e., those involving goal striving and attainment) have been found to predict episode onset in individuals with BSD. Among individuals with BSDs, goal striving and attainment events are "BAS activating" as they tend to result in the onset of (hypo)manic symptoms/episodes, whereas events involving goal failure and loss are "BAS deactivating" as they tend to result in the onset of depressive symptoms/episodes (Alloy, Abramson, Urošević, Bender, & Wagner, 2009; Nusslock, Abramson, Harmon-Jones, Alloy, & Hogan, 2007). In one instance, college students with BSDs were much more likely to experience the onset of a hypomanic episode when they had recently studied for and taken final exams (goal striving; Nusslock et al., 2007). The onset of a new hypomanic episode was experienced in 42% of the students with BSD who reported such BAS-relevant events compared with only 4% of those with BSD who did not experience such events during the same period (Nusslock et al., 2007). Similarly, events characterized as "goal attainment" prospectively predicted increases in manic symptoms and this effect was not found for positive events in general (Johnson et al., 2000, 2008). Furthermore, as well as being "activated" or "deactivated" by BAS-relevant events, individuals with BSD may generate more BAS-relevant events (both BAS activating and BAS deactivating) in their lives (Urošević et al., 2010). Such stress-generation by those with BSD may result in increased exposure to more reward-relevant events, which may increase the likelihood of a bipolar episode.

Moreover, reward hypersensitivity in adolescents and emerging adults has been found to predict first lifetime onset of BSD (Alloy, Bender, et al., 2012), recurrence of bipolar mood episodes (Alloy et al., 2008), and progression to more severe BSDs (e.g., cyclothymia and bipolar II to bipolar I, cyclothymia to bipolar II; Alloy, Urošević, et al., 2012). No studies as yet have examined neurobiological measures of BAS sensitivity as predictors of first onset of BSD; however, there is preliminary evidence of elevated neurophysiological (electroencephalogram [EEG]) and neural (functional magnetic resonance imaging [fMRI]) indices of reward processing in individuals at behavioral or genetic high risk for BSD (see Alloy et al., 2015, in press, for reviews). In summary, although a large body of evidence supports the predictions of the BAS hypersensitivity theory of bipolar disorder and the role of reward hypersensitivity as a vulnerability for BSD, some research does not support the BAS/reward hypersensitivity model (see Alloy et al., 2015, in press, for reviews). For example, one study did not find increased self-reported BAS sensitivity among the adolescent offspring of bipolar parents compared with the offspring of healthy control parents (Jones, Tai, Evershed, Knowles, & Bentall, 2006). And, another study found that low, rather than high, BAS sensitivity predicted depressive episode relapse among BSD individuals (Salavert et al., 2007).

As the prefrontal circuitry of the brain that helps regulate reward sensitivity is under development into the 20s (Gogtay et al., 2004), individuals age 14–21 experience amplified sensitivity to reward (Steinberg & Chein, 2015).

Although sensitivity to reward reaches its peak in the late teens, cognitive control capacities require a more protracted development and decision making during emerging adulthood may be unduly influenced by rewards (Shulman et al., 2016). As emerging adulthood is a time of increased goal striving in academic, occupational, and social realms, opportunities for BAS activation and deactivation (due to goal striving/attainment and goal loss/failure, respectively) are abundant. In the midst of a developmental period of hypersensitivity to rewards, emerging adults with an overly sensitive BAS system may be at amplified risk to experience (hypo)manic or depressive symptoms and the onset of a mood episode. Being aware of BAS hypersensitivity to reward during emerging adulthood may help temper the onset of depression or (hypo)mania. Without intervention, bipolar disorder appears to progress and accelerate over time (e.g., "kindling"; Post & Weiss, 1996) into a more chronic and refractory condition (Berk, Brnabic, et al., 2011; Berk, Kapczinski, et al., 2011). There is also evidence that repeated bipolar episodes are associated with deficits in neurocognition and neurostructural abnormalities (Brietzke et al., 2012). Thus, early intervention may greatly benefit emerging adults with bipolar disorder and improve their course of the disorder (Kessing et al., 2014). Accordingly, the present paper summarizes relevant findings on the BAS hypersensitivity model that support the use of reward sensitivity as a tool for the early identification of BSDs and suggests evidence-based strategies and tactics for clinical work with emerging adults with BSDs.

Implications of the BAS Model for Assessment of BSD in Emerging Adults

One low-cost approach with minimal time investment would be to incorporate self-report instruments into clinical practice as initial screening devices. The development of algorithms to select those at high risk of BSDs is in the initial stages but one multimodal approach includes family history and early adversity (Brietzke et al., 2012). Currently there are no comprehensive assessment tools that use reward sensitivity as a primary risk factor; however, to build an assessment based on the BAS hypersensitivity model, one would want to assess reward sensitivity in multiple modalities.

In accordance with the BAS hypersensitivity model, three self-report instruments have been found to successfully predict the first onset of BSD in adolescents and emerging adults. Two motivational systems are thought to underlie human behavior and affect: the Behavioral Inhibition System (BIS) and the Behavioral Activation System (BAS; Gray, 1994). Self-report measures to test individual differences in on the BIS and BAS were developed and the BAS subscales assess sensitivity to cues of impending reward (Carver & White, 1994). The behavioral high-risk design for Project TEAM (Teen Emotion and Motivation; Alloy, Bender, et al., 2012) selected adolescents and emerging adults screened to have no prior history of BSD, but who were at hypothesized high or low risk for the disorder based on self-reported BAS (BIS/BAS scales; Carver & White, 1994) and reward sensitivity (Sensitivity to Punishment Sensitivity to Reward Questionnaire [SPSRQ]; Torrubia, Avila, Molto, & Caseras, 2001). After a follow-up period of just over 1 year (i.e., an average of 12.8 months) and controlling for family history of bipolar disorder and current mood symptoms, high-BAS individuals were significantly more likely to develop BSD (12.3% vs. 4.2%; Alloy, Bender, et al., 2012) and those who did develop BSD had a significantly shorter time to the first onset of the disorder (Alloy, Bender, et al., 2012) than did moderate-BAS individuals. In the same sample, self-reported highly ambitious goal striving (Willingly Approached Set of Statistically Unlikely Pursuits Questionnaire [WASSUP]; Johnson & Carver, 2006) also significantly predicted a shorter time to the first onset of BSD (Alloy, Bender, et al., 2012).

Additionally, behavioral measures of BAS reward sensitivity have been found to predict the time to the first onset of BSD. One example, the Card Arranging Reward Responsivity Objective Task (CARROT; Al-Adawi, Powell, & Greenwood, 1998), only takes a few minutes and can be administered easily in a clinical setting. The number of cards an emerging adult sorted when offered monetary rewards compared with the number of cards sorted in the same time period without a monetary reward predicted the time until the individual experienced the first onset of BSD (Alloy, Bender, et al., 2012). Although it has not yet been tested as a predictor of BSD, a behavioral task assessing reward sensitivity is the Effort Expenditure for Rewards Task (EEfRT; Treadway, Buckholtz, Schwartzman, Lambert, & Zald, 2009). The EEfRT examines the extent to which individuals are willing to expend effort for monetary reward; on each trial of the task, the person chooses between performing a hard task for a higher reward or an easy task for a smaller reward (reward magnitude and probability are varied across the trials). Anhedonia and depression predict reduced selection of the hard task for a higher reward (Treadway et al., 2009), whereas increased selection of the hard task for a larger reward is hypothesized to predict risk for BSD.

Finally, BAS reward sensitivity as assessed with neurophysiology has been found to predict first onset of bipolar I disorder. Greater relative left frontal cortical activity measured by EEG has been correlated with approach/reward affect (Sutton & Davidson, 1997) and individuals with BSD show greater relative left frontal activation to a challenging goal-striving task (hard anagrams) than healthy controls when anticipating rewards, but not punishments

(Harmon-Jones et al., 2008). Extending this work, high-BAS emerging adults at risk for BSD exhibited greater relative left frontal activity at rest (Black et al., 2014) and greater relative left frontal cortical activity in response to rewards than punishments in the challenging anagram task (Black et al., 2016). Moreover, increased relative left frontal EEG activation at rest predicted progression to bipolar I among participants with milder BSDs (Nusslock et al., 2012), whereas increased relative right frontal cortical EEG activation predicted first onset of major depression (Nusslock et al., 2011). As measured by fMRI, elevated activation in the frontostriatal circuit in regions such as the ventral striatum (VS) and orbitofrontal cortex (OFC) during reward anticipation is found in individuals with bipolar I disorder, even while euthymic (Nusslock et al., 2012), and hyperactivation in the VS during reward anticipation has been found in individuals with bipolar II disorder (Caseras, Lawrence, Murphy, Wise, & Phillips, 2013). Hyperstriatal/OFC activity may be specific to BSD risk, as unipolar depression is typically associated with an opposite profile of blunted reward processing (e.g., Epstein et al., 2006; Forbes et al., 2009; Henriques & Davidson, 2000; McCabe, Cowen, & Hammer, 2009; Smoski et al., 2009; Steele, Kumar, & Ebmeier, 2007); however, to use frontostriatal activation as an assessment tool in the identification of emerging adults at risk for BSD, future research will need to assess whether VS and OFC activity predicts the first onset of BSD.

Inasmuch as BAS/reward hypersensitivity predicts first onset of BSDs, recurrence of mood episodes, and progression to more severe BSDs in emerging adulthood, it may be possible to identify those at risk for the onset and/or a more severe course of BSD with a multimodal assessment using self-report, behavioral tasks, and neurophysiology. Early intervention with at-risk emerging adults may ameliorate the course of BSD (Kessing et al., 2014). After a diagnosis of BSD has been made, the BAS hypersensitivity model may be useful in predicting when the probability of onset of a manic or depressive episode is high (Nusslock, Abramson, Harmon-Jones, Alloy, & Coan, 2009). We want to clarify that not everyone who displays high reward sensitivity will go on to develop a BSD; the use of multiple methods of assessment will lower the possibility of "false positives." Even with careful assessment, someone with a highly sensitive BAS could still be "misdiagnosed" as being likely to develop bipolar disorder; however, the probability of this false "diagnosis" leading to negative consequences is low, especially if the clinician emphasizes that this is an educated estimate and does not mean that the emerging adult will definitely go on to develop the disorder. Moreover, many of the suggestions a clinician may recommend to those at risk of developing BSDs (e.g., stabilizing social and circadian rhythms) may be of benefit to the emerging adult regardless of risk status.

Implications of the BAS Hypersensitivity Model for Treatment of BSD

Although mood-stabilizing drugs have been shown to result in more time out of the hospital for individuals with bipolar disorder (Goodwin & Jamison, 2007; Nusslock et al., 2009; Patel et al., 2006), relapse rates for those relying primarily on psychopharmacological treatment remain relatively high. Given that pharmacotherapy may not be sufficient treatment for all individuals and substantial research supports environmental factors as reliable predictors of the onset and frequency of episodes in individuals with BSD (Miklowitz & Johnson, 2006), psychosocial treatments for bipolar disorder have been developed to work in conjunction with medication. Psychoeducation, cognitive-behavioral therapy (CBT), and interpersonal and social rhythm therapy (IPSRT) have each been shown to be efficacious interventions for bipolar disorder that can significantly reduce depressive and (hypo)manic symptoms, increase the time between bipolar episodes, decrease the frequency of episode recurrences, and improve psychosocial functioning in a number of domains (Frank, Swartz, & Kupfer, 2000; Lam et al., 2000, 2003; Lam, Hayward, Watkins, Wright, & Sham 2005; Scott, Colom, & Vieta, 2007). Evidence gained through research on BAS/reward hypersensitivity may be useful to clinicians currently engaged in psychoeducation, CBT, and/or IPSRT with emerging adults with BSD.

Psychoeducation

Although emerging adulthood is a time of increased autonomy and the continued importance of same-age peers, evidence suggests that parental support is more important than peer support during this time and that parental support especially may influence emotional well-being (Pettit, Roberts, Lewinsohn, Seeley, & Yaroslavsky, 2011). Individuals with bipolar disorder whose parents attended caregiver psychoeducation groups had a longer interval to the next (hypo)manic episode as parents were able to effectively detect bipolar prodromes and intervene successfully (Reinares et al., 2008). Additionally, family-focused therapy that includes a component of psychoeducation can lead to a reduced risk of recurrence of bipolar symptoms and episodes for both adolescents and adults (Miklowitz, 2008).

Clients and their family members may need to be instructed in the importance of identifying triggers of bipolar episodes (Morris, Miklowitz, & Waxmonsky, 2007); education on recognizing indicators of depressive or (hypo)manic onset (e.g., excessive goal setting) may help modify goal-striving attitudes and adjust goal-directed activity during prodromal periods. Psychoeducation may include how BAS-relevant life events may be self-generated

(e.g., studying for and taking final exams, breaking up with a significant other) as well as occur independently of the individual's behavior (e.g., university team wins, death of a friend) and that moderating goal striving may be one way to limit self-generated BAS events (Nusslock et al., 2009). As a high degree of occupational and educational attainment has been observed in the family members of individuals with BSD (Johnson, 2005; Tsuchiya, Agerbo, Byrne, & Mortensen, 2004), extreme goal-striving attitudes and behaviors may be considered normative by family members unless they are educated on the risks these attitudes and behaviors may pose for the individual with BSD (Nusslock et al., 2009). Family members also can be advised to be supportive and noncritical if the individual experiences loss or failure to attain a goal; if bipolar individuals are distressed by the negative expressed emotion of family members, this may lead to more severe depressive and manic symptoms (Kim & Miklowitz, 2004; Miklowitz, Wisniewski, Miyahara, Otto, & Sachs, 2005).

Cognitive-Behavioral Therapy

CBT may most effectively prevent recurrences of bipolar episodes in those who have been diagnosed recently and are relatively early in their course of BSD (most likely during early adulthood). In one study, CBT led to fewer recurrences (depressive, manic, [hypo]manic, or mixed) of BSD but only for those who had experienced fewer than 12 previous episodes (Scott et al., 2006). Distinct from the cognitive styles of dependency and attachment typically observed among unipolar depressed individuals, individuals with BSDs exhibit BAS-relevant cognitive styles of performance concerns/perfectionism ("If I fail partly, it is as bad as being a complete failure"), autonomy ("I value work accomplishments more than I value making friends"), and self-criticism ("There is a considerable difference between how I am now and how I would like to be"); such cognitive styles prospectively predict the onset of both (hypo)manic and depressive episodes among individuals with BSD (Alloy, Abramson, Walshaw, et al., 2009).

Moreover, if an individual with BAS-relevant cognitive styles experiences BAS-activating events, he or she is more likely to subsequently experience an increase in (hypo)manic symptoms or experiences BAS-deactivating events, and is then more likely to experience an increase in depressive symptoms (Francis-Raniere, Alloy, & Abramson, 2006). For example, if an emerging adult with BSD demonstrates a cognitive style characterized by performance concerns ("If I do not do as well as other people, it means I am an inferior human being") and self-criticism ("I have a difficult time accepting weaknesses in myself") and receives a low grade in a course, the individual may experience increased risk for depression.

Research suggests that (hypo)manic and depressive prodromes may be the most effective periods in which to target cognitions associated with bipolar disorder (Lam et al., 2003). The BAS hypersensitivity model may aid in the detection of prodromal periods, as increases and decreases in goal-directed activity are one of the most common behaviors reliably associated with bipolar prodromes (Lam & Wong, 1997; Lam, Wong, & Sham, 2001). The BAS hypersensitivity model suggests that it may be beneficial to apply cognitive restructuring to the client's thoughts concerning goal striving and goal attainment, such as identifying and challenging the beliefs that lead to extreme goal setting and heightened expectations of success in the achievement domain. CBT focused on excessive goal striving has been found to significantly reduce goal-striving attitudes as well as lower rates of both bipolar depression and mania episode onset (Lam et al., 2003). Clients displaying (hypo)manic symptoms may be assisted in decreasing goal-directed activity (e.g., extra time to rest, calming activities); this deactivation strategy has been shown to be helpful to those experiencing a manic prodrome and to lead to a lower likelihood of a manic episode (Lam et al., 2001). However, clients experiencing depressive symptoms may be advised to increase behavioral activation strategies at this time (e.g., keeping busy and getting organized, becoming more social), which may lead to a lower likelihood of a depressive episode (Lam et al., 2001).

Noting that cognitive therapy as currently practiced with bipolar individuals tended to reduce depressive symptoms but not manic symptoms (Scott et al., 2006), one preliminary treatment program focused on improving goal regulation for individuals with bipolar disorder (the GOALS program; Johnson & Fulford, 2009). Drawing on goal dysregulation research as well as cognitive-behavioral strategies, the program was found to significantly reduce manic symptoms (Johnson & Fulford, 2009). Although further replication incorporating a control group, larger sample size, and follow-up data is needed, it is encouraging that treatment targets specified by the BAS hypersensitivity model were useful and results suggest that goal regulation could be incorporated into clinical intervention strategies for (hypo)manic symptoms.

Interpersonal and Social Rhythm Therapy

IPSRT, based on the psychochronobiological theory of BSD, attempts to limit the recurrence of bipolar symptoms and episodes by regulating social and circadian rhythms (Ehlers, Frank, & Kupfer, 1988; Ehlers, Kupfer, Frank, & Monk, 1993; Frank et al., 2000; Monk, Flaherty, Frank, Hoskinson, & Kupfer, 1990; Monk, Kupfer, Frank, & Ritenour, 1991). Treatment with IPSRT includes (a) understanding the link between mood and life events,

(b) stressing the importance of maintaining regular daily rhythms, (c) identifying and managing precipitating stimuli that contribute to rhythm dysregulation (with special attention paid to the interpersonal triggers of grief, role disputes, role transitions, and interpersonal deficits), (d) facilitating the mourning of the lost healthy self, and (e) continued identification and management of affective symptoms (Frank, 1999; Frank et al., 2000).

IPSRT may be especially relevant to emerging adults, as many are experiencing disruptions in social and circadian rhythms. Potentially for the first time, the emerging adult may be living on his or her own away from family schedules and now has increased control over his or her bedtimes, mealtimes, and social interactions. The emerging adult may choose to prioritize finances, studying, and/or social activities over consistent times for sleeping and eating. In addition to class schedules changing throughout the year, an emerging adult in college may be working at one (or more) jobs as well as a full-time class load and an irregular schedule may be adopted out of necessity or convenience. A recent survey (Davis, 2012) found that almost three quarters of college undergraduates worked (almost 50% worked more than 20 hours per week). Furthermore, sleep in college students is often poor in quality as well as quantity (Carney, Edinger, Meyer, Lindman, & Istre, 2006; Gomes, Tavares, & de Azevedo, 2011) and delays in sleep phase are common (Singleton & Wolfson, 2009).

As circadian preferences appear to consolidate around age 22 (Roenneberg et al., 2004), the stabilization of social and circadian rhythms in an emerging adult with BAS hypersensitivity may help establish better rhythmicity throughout the life course. Both positive and negative life events can trigger bipolar episodes by causing a dysregulation of biological rhythms (Ehlers et al., 1988). If life events result in a reduction in sleep for an individual with bipolar disorder, this may prompt a manic episode (Leibenluft, Moul, Schwartz, Madden, & Wehr, 1993; Leibenluft & Wehr, 1992). Goal-striving events have the potential to disrupt social routines as well as reduce sleep; notably, goal-directed activity and decreased sleep are the two most reliable indicators of the manic prodromal period (Lam & Wong, 1997). Both BAS-activating and BAS-deactivating events disrupt social rhythms, which can lead to increases in (hypo)manic and depressive symptoms, respectively (Boland et al., 2015). A clinician may want to work with the emerging adult to identify the value of present goals and the extent to which stated goals might disrupt the social and circadian rhythms of the client (Monk et al., 1991); subsequent discussion could emphasize strategies for coping with any rhythm dysregulation engendered by goal striving and for achieving more regularity in biological and circadian rhythms (Nusslock et al., 2009). Questioning goal-related behavior might be difficult and initially counterintuitive for the individual, as it may involve challenging attitudes and behaviors that appear positive and proactive.

Conclusion and Further Directions

Although not all emerging adults diagnosed with BSD will display high BAS sensitivity (and not all those with high BAS sensitivity will develop BSD), recent research on the BAS/reward hypersensitivity model indicating that reward hypersensitivity is a risk for BSD onset and recurrence may inform the assessment of BSD in emerging adults and help structure the use of psychoeducation, CBT, and IPSRT as psychosocial treatments for some individuals. Emerging adults with BSD need to be educated on how goal-directed activity increases their vulnerability to bipolar episodes and family members should be warned of the potential influence of negative expressed emotion in the achievement domain on the emerging adult with BSD. As individuals with BSD have been shown to have cognitive profiles characterized by high goal striving, autonomy, self-criticism, and perfectionism in the achievement domain, restructuring goal-directed thoughts and behaviors may need to be prioritized in CBT. Furthermore, clinicians and clients should be aware of the possible disruption of social and circadian rhythms by both independent and self-generated BAS-relevant events in the achievement as well as interpersonal domains.

Although emerging adults with BSD do not need to avoid every goal-relevant event that arises, they might want to be aware that such events may provoke greater risk for the recurrence of a bipolar episode. For example, an emerging adult with BSD begins his first professional job; he is pleased to be able to finish a task before the deadline and asks for additional work. He is rewarded by praise, his confidence increases, and he becomes motivated to continue to take on extra work in order to impress his boss with the goal of being promoted in record time. If this goal-directed behavior leads to increased prodromal ([hypo]manic) symptoms and overinflated confidence or grandiosity, the emerging adult may end up taking on more work than he can ably handle. If professional goals exceed capabilities, he may fail to meet his goal of rapid promotion and perhaps even initial professional obligations. The end result may be failure in the achievement domain, BAS deactivation, and ultimately an increase in symptoms of depression. If he then receives negative feedback from family, this may further increase the chances of a spiral into depression. If the emerging adult was aware of the role of stress generation in the BAS-hypersensitivity model, he may have questioned his decision to take on more work or abandoned the goal of quick promotion, and perhaps averted the onset of a bipolar episode.

However, we do not mean to suggest that emerging adults with reward hypersensitivity resign themselves to a life without goal attainment, but awareness that goal pursuit has been found to be a trigger for bipolar episodes may prove useful. The overall objective of assessment and treatment should be to maximize an individual's ability to pursue goals and the chance of goal satisfaction, while simultaneously managing and minimizing risk for bipolar episode onset. The emerging adult may fear the relinquishment of all pleasurable activities or achievement strategies that may have been associated with some success (Lejeune, 2011). A treatment provider may need to validate the possible feeling of loss of former habits for the emerging adult and clarify that meeting goals while euthymic is an achievable option (Lejeune, 2011). Emerging adults can be guided to the realization that modifying goal-striving behavior is a choice they are making in order to achieve a healthier and more satisfying life.

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