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The clinical significance of creativity in bipolar disorder

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Abstract

Clinical implications of the high rates of creativity within bipolar disorder (BD) have not been explored. The aim of this review is to outline these implications by (i) reviewing evidence for the link between creativity and BD, (ii) developing a provisional model of mechanisms underpinning the creativity–BD link, (iii) describing unique challenges faced by creative-BD populations, and (iv) systematically considering evidence-based psychosocial treatments in the light of this review. While more research into the creativity–BD nexus is urgently required, treatment outcomes will benefit from consideration of this commonly occurring phenotype.

Keywords

Bipolar disorder; Creativity; Personality; Positive affect; Psychosocial treatments

1. Introduction and overview

American Psychological Association guidelines assert that best research evidence is only one driver of evidence-based practice (American Psychological Association, 2005). Clinicians should also consider *patient characteristics, values and context* and use *clinical expertise* to integrate this information into their case formulations and treatment plans.

In this review, we take one disorder — bipolar disorder — and consider the clinical implications of one associated characteristic — creativity. There is a natural co-occurrence of creativity and bipolar disorder (BD), and clinicians who treat people with BD are therefore likely to work with highly creative individuals. To our knowledge, no treatment manuals or articles currently provide guidance about how to consider creativity in the context of BD. The aims of this review are to identify mechanisms underpinning the co-occurrence between BD and creativity, to consider the particular challenges faced by highly creative people with bipolar disorder, and to systematically tease out the clinical implications of these mechanisms and barriers.

After defining core terms (Section 2), we present evidence for the association between creativity and BD phenotypes drawing from the literature on personality, motivational, cognitive, and affective predictors of creativity, and considering those that overlap with BD (Section 3). We then introduce a provisional model of the creativity–BD link (Section 4). The model highlights mechanisms that warrant further research, and provides a provisional characterization of the variables that may be relevant for clinicians. In the latter sections,

this model is used to frame an investigation of opportunities and challenges in treating a creative-BD presentation. Lifestyle risks (Section 5), barriers to engagement (Section 6) and optimizing evidence-based treatments in this population (Section 7) are considered. It is concluded that creativity is a potential moderator and mediator of psychological treatment of some individuals with BD, and recognition of these interactions can improve rapport, case formulation and treatment planning.

2. Definitions

Bipolar disorder is defined on the basis of manic symptoms of varying severity. Bipolar I disorder, defined by a full-blown episode of mania (either without a concomitant episode of depression or with a concomitant depression, labeled a ‘mixed’ episode), receives more research and clinical attention than milder forms. Nonetheless, increasing attention has been given to bipolar II disorder, defined by hypomanic episodes and depressive episodes, and cyclothymia, defined by frequent swings between subsyndromal depressive and manic symptoms that do not develop into full-blown episodes. Whereas bipolar I disorder affects approximately 1% of the population, another 2.9% appears to develop bipolar II disorder (Kessler et al., 2005), and perhaps 4.2% of the population are affected by cyclothymia (Regeer et al., 2004). Given that the milder forms of the disorder are more common, it is important to consider the full spectrum of bipolar diagnoses.

Creativity is typically defined as behaviours or thoughts that are both novel/original and adaptive/useful (Feist, 1998). A related distinction is between generativity (inspiration) and consolidation (editing, polishing and communicating) components of creative production (Schuldberg, 2001), reminiscent of the “inspiration versus perspiration” distinction attributed to Thomas Edison.

Research into creativity has a long history (Hennessey & Amabile, 2010; Runco, 2004), and to tackle the breadth of the literature, research has been classified into the study of creative persons, processes and products (Rhodes, 1987). Creativity as a *personal attribute* is often measured simply as occupation, raising the question of domain-general vs domain-specificity of creativity (Batey & Furnham, 2006), and the distinction between eminent and everyday creativity (Ivcevic & Mayer, 2009). The *creative process* can be partitioned into problem finding, ideation and evaluation (Runco & Chand, 1995). Creative performance is typically operationalized in one of three ways: divergent thinking tasks (e.g., uses for a brick, Lamm & Trommsdorff, 1973); insight tasks (e.g., Duncker, 1945) or external judgments of creative products (e.g., Amabile, 1985).

3. Evidence for an association between creativity and bipolar disorder

The “mad genius” notion remains so prominent that the author of a recent review found it necessary to write, “Creativity is not a kind of psychopathology!” (Runco, 2004, p.679). The perennial stereotype aside, there is broad evidence that creativity and psychopathology are correlated. For example, a recent meta-analysis of 36 studies estimated the effect size linking psychopathological traits to divergent thinking to be .50 (Ma, 2009). The strongest evidence is for a link between creativity and BD (Runco, 2004).

3.1. Elevated rates of creativity within bipolar disorder

Reviews of biographical material have suggested that BD is significantly over-represented among samples of authors (Andreasen, 1987; Ludwig, 1994), poets (Jamison, 1989), and visual artists (Jamison, 1993). For example, Ludwig (1992) reviewed biographical material from 1005 eminent individuals. About 8.2% of those in creative professions (including architecture/design, musical composition, musical performance, theater, expository writing,

fiction writing and poetry) appeared to have had experiences of mania. Compared with the general population prevalence of about 1%, multiple studies suggest that some 10% of artists (broadly defined) endorse symptoms of BD (Goodwin & Jamison, 2007; Rothenberg, 2001).

The link between creativity and BD is also found in non-eminent samples. For example, Richards et al found bipolar spectrum patients to have significantly higher lifetime creative accomplishment than healthy controls on the Lifetime Creativity Scales (Richards, Kinney, Lunde, Benet, & Merzel, 1988). Similarly, Santosa et al. (2007) found people with BD to have Baron–Welsh Art Scale scores (Barron, 1963) higher than healthy controls and comparable to graduate students in creative disciplines (see also, Strong et al., 2007). In the ECA study of a representative sample of 13,700 people living in the United States, BD was over-represented in the most creative occupations, such as painting, writing, and lighting design (Tremblay, Grosskopf, & Yang, in press). It has been estimated that approximately 8% of people diagnosed with bipolar spectrum disorder might be considered creative (Akiskal & Akiskal, 2007).

Consistent with a link between BD and creativity, hypomanic traits in healthy samples have been found to predict self-rated creativity, divergent thinking fluency and a biographical measure of spontaneous everyday creative achievement (Furnham, Batey, Anand, & Manfield, 2008; Guastello, Guastello, & Hanson, 2004 see also Shapiro & Weisberg, 1999). Hypomanic traits have also been linked to preferences for novel and complex figures (Rawlings & Georgiou, 2004; Schuldberg, 2000). Various measures of creativity have been linked to other traits important to BD, including mania-proneness (Colvin, 1995) and measures of cyclothymia (Akiskal et al., 2006). A more remote, but potentially important link is with evening chronotype (see, Giampietro & Cavallera, 2007; Wood et al., 2009).

It is useful to note some qualifications on the association between creativity and BD. Firstly, the putative link is yet to be directly tested in epidemiological research, and existing evidence derives primarily from large-*n* case-report studies. A more direct test of the two core deductions (elevated prevalence of BD in creative populations and elevated creativity in BD populations) awaits bespoke epidemiological designs. Such studies are warranted on the basis of evidence reviewed here, and would also permit testing of hypothesised moderators and mediators of the link (see Section 4).

Secondly, the relationship between creativity and BD appears to be non-linear. For example, using ratings of lifetime creative accomplishments, Richards, Kinney, Lunde, et al. (1988) found those with milder forms of BD to have greater accomplishments than those with bipolar I disorder, and unaffected family-members of bipolar persons had higher creative output than those with the disorder (see also, Akiskal & Akiskal, 1988; Simeonova, Chang, Strong, & Ketter, 2005). Similarly, in a survey of accomplished authors, more respondents (30%) met criteria for bipolar II disorder than for bipolar I (13%) (Andreasen, 1987). These findings are consistent with the idea that vulnerability to mania is related to creativity, but that more severe expressions of symptoms may interfere with lifetime accomplishment (the inverted U hypothesis, Richards, Kinney, Benet & Merzel, 1988).

Thirdly, the majority of evidence cited above concerns artistic creativity, and there are grounds for concluding that BD is primarily linked to artistic rather than scientific creative achievement. Psychopathology generally is correlated with creativity across many different domains, but more severe psychopathology correlates with achievement in the arts rather than the sciences (Simonton, 2009). Furthermore, the personality profile of BD aligns with the artistic more than the scientific temperament (see below).

Finally, it has been proposed that BD is primarily associated with a particular kind of creative aesthetic. Sass argues that the literature emphasizing creativity in BD (specifically Jamison's seminal work) is limited to a *romanticist* account, in which emotionality is privileged, social standing is a central reference point (e.g., grandiosity in mania and rejection sensitivity in depression), and sublime connection with the world is the creative goal (Sass, 2001a,c). As an aesthetic stance, Romanticism prioritizes intuition and imagination and can be understood as a reaction against Enlightenment reason (see Glazer, 2009). Sass contrasts this form of creativity with a more radical deviation from norms in *postmodern* creativity, an aesthetic which emphasizes aloof skepticism and is consistent with the alienated self-consciousness of shizotypy/psychotic disorders (Sass, 2003). Sass acknowledges the weight of evidence demonstrating a primary and strong association between creativity and affective disorders, but proposes that this association speaks partly of the “ability to promote oneself by networking, the ability to share the concerns of one's audience” (Sass, 2001b, p. 69).

In sum, there are good grounds for the widely-held belief that creativity and BD are linked in some way. A series of studies suggest that many people with bipolar spectrum disorders appear to be highly creative. Studies that begin by sampling highly creative populations also suggest that bipolar disorder is over-represented. As reviewed below, it can be argued that the association between creativity and bipolar disorder likely arises from a partly shared substrate in personality traits and cognitive-affective processes.

3.2. The mediating role of dispositional traits

One way to investigate the apparent association between BD and creativity is to consider personality traits (Batey & Furnham, 2006; Eysenck, 1993). A review of the personality traits associated with creativity and BD suggests significant overlap. We briefly note traditional personality traits, but also traits such as dedication and ambition that might play a role in creative success.

3.2.1. Personality and creativity—Research has identified personality correlates of creativity that operate across domains of creativity, as well as some that are more related to specific domains. The trait openness to experience (O) is a medium-effect correlate of creativity across domains of creativity. For example, a meta-analysis of occupation found a median effect size d of .47 for O as a correlate of artists versus non-artists; medium size effects were also found for creative versus less creative scientists ($d=.31$) (Feist, 1998). The primacy of O as correlate of creativity across domains has since been replicated in a number of studies (see, Silvia, Nusbaum, Berg, Martin, & O'Connor, 2009). This reliable finding is consistent with the defining feature of O, motivation and sensitivity towards novel ideas and experiences (McCrae & Costa, 1997; McCrae & Inghram, 1987). The trait also correlates with intellect (DeYoung, Quilty, & Peterson, 2007), and may relate to some aspects of creative accomplishment through this disposition (Carson, Higgins, & Peterson, 2003).

Creativity as *originality of thought* is likewise seen in the replicated association between creativity and the trait of psychoticism (P) (Eysenck, 1993): O and P share tendencies towards perceptual openness, but P is additionally associated with antisocial tendencies, whereas O is additionally associated with attitudinal openness (Batey & Furnham, 2006). The replicated association between creativity and *impulsivity* may speak to similar dispositions, highlighting unconstrained expression of impulses and needs (Feist, 1998; Schulberg, 2000).

The trait extraversion (E) also has reliable, but less ubiquitous, associations across domains and levels of creativity (Batey & Furnham, 2006). Within E, the *confidence-dominance* facet seems central, with the *sociability* facet playing a more qualified role depending on the

creativity measure and domain (McCrae & Ingraham, 1987). Within the artistic domain, performance occupations (musicians, singers, actors, etc.) can be distinguished from occupations characterized by creation of standing works of art (e.g., visual artists, writers and composers) (Kogan, 2002). The former group engages in a very social activity, the latter in a primarily private process, and achievement in performing arts is specifically associated with elevated E and agreeableness (A) (Ivcevic & Mayer, 2009).

The trait conscientiousness (C) shows evidence of domain-specificity, with a strong positive association with science occupations (versus non-science), negative association with art (versus non-artists), and a negative association with creativity within science (Feist, 1998). Considering the negative associations, it is important to note that many have conceptualized impulsivity as the low end of conscientiousness (e.g., Goldberg, 1993).

Existing research suggests that there are two personality components to *creativity as achievement*. While O and P (and perhaps impulsivity) may be central to the “inspiration” ingredient, additional motivational traits are critical for the “perspiration” involved in actual accomplishments. Careful review of influential musicians, visual artists, and writers reveals that most produce their creative output (whether commercially recognized or not) only after years of practicing their skill (Sternberg, 2006; with passion supporting this sustained effort, Vallerand et al., 2007). Not surprisingly, then, the meta-analysis of Feist identified highly elevated levels of *ambition* and *drive to achieve* in people who accomplish creative products in both science and arts. Hence, dedication and persistent work towards creative goals appears to be a prerequisite for accomplishment in most cases, and this dedication may derive largely from ambition and dedication.

Although the above findings have focused largely on traits that operate across many different domains of creativity, other traits, such as Neuroticism(N) may be related to more specific forms of creativity. Feist's meta-analysis showed that N is a barrier to creativity in science but may be positively related to achievement in the arts (Feist, 1998), presumably because of N's association with emotional sensitivity (Batey & Furnham, 2006).

3.2.2. Personality traits and bipolar disorder—The personality correlates of BD are reasonably well understood. Like the high prevalence disorders, BD is primarily associated with elevated N compared to the general population (Murray, Goldstone, & Cunningham, 2007; Quilty, Sellbom, Tackett, & Bagby, 2009; Smillie et al., 2009). There is also evidence for elevated O in BD (Lozano & Johnson, 2001; Nowakowska, Strong, Santosa, Wang, & Ketter, 2005; Ren & Dia, 2001; Strong et al., 2007). Some studies have found that elevated E separates BD from unipolar depression and the internalizing disorders (Bagby et al., 1997; Hecht, Van Calker, Berger, & Von Zerssen, 1998; Ren & Dia, 2001; but see for nonreplication Sacher, 2003; Tackett, Quilty, Sellbom, Rector, & Bagby, 2008). The positive relationship between E and BD may be strongest in the mania-proneness component of BD diathesis (Murray et al., 2007), and may be more pronounced in BD-II (Akiskal et al., 2006). Particular components of E, such as positive affectivity (Murray McNiel, Lowman, & Fleeson, 2010) or reward pursuit (Johnson, 2005) may be more specifically related to BD. These traits, then, may help explain some of the overlap between BD and creativity.

One well-replicated finding is the importance of high goal-setting among persons at risk for mania. In a series of 8 samples at-risk for BD (Carver & Johnson, 2009; Fulford, Johnson, & Carver, 2008; Gruber & Johnson, 2009; Gruber, Johnson, Oveis, & Keltner, 2008; Johnson & Carver, 2006; Johnson & Jones, 2009) and in a diagnosed sample of people with BD (Johnson, Eisner, & Carver, 2009) those prone to mania endorsed extremely elevated lifetime ambitions for success. In each study, mania appears related to extrinsically-oriented ambitions to achieve the recognition of others, through popular fame, financial success, and

creative accomplishment. Those who are mania-prone do not seem to differ from others on their lifetime ambitions for connectedness or other intrinsic goals. This tendency towards ambitions for public recognition may help fuel the determination and persistence required of highly creative quests.

A final disposition of note in BD is impulsivity. A growing body of research suggests that impulsivity tends to be elevated among persons with BD, even during well states (Leibenluft et al., 2007; Peluso et al.; Swann, Anderson, Dougherty, & Moeller, 2001; Swann, Dougherty, Pazzaglia, Pham & Moeller, 2004; although see Christodoulou, Lewis, Ploubidis, & Frangou, 2006, for a nonreplication). Impulsivity tends to become even more pronounced during manic periods (Swann et al., 2004). As noted above creativity appears related to impulsivity, or the unconstrained expression of impulses and needs (Feist, 1998; Schulberg, 2000). It is possible that impulsivity may help promote expressiveness without constraint, fostering ability to produce more unique products.

3.2.3. Conclusion—A substantial literature links different domains of creativity with personality traits, motivational styles and affective tendencies. Hence, one way to refine our understanding of creativity among people with BD is to consider personality and motivational qualities associated with BD. There is reason to think that the association between creativity and BD partly operates through dispositional traits that are important in both phenotypes. The modal personality profile in BD appears to be consistent with creativity generally (high O) and artistic pursuits (high N). Literature is more mixed concerning whether BD is characterized by high E, but those persons who do experience high E may be particularly drawn towards performance arts. Beyond personality, the motivational traits of high goal-setting and impulsivity are strongly implicated in both BD and creative output.

3.3. Bipolar disorder and the process of creativity

Research into the creative process has focused on the ability to generate unusual associations and to use visual imagery in support of problem-solving as facets of creativity. There is robust evidence that positive moods can enhance the ability to generate unusual associations. Intriguingly, each of these affective and cognitive processes has been documented in BD as well.

3.3.1. Creativity as a process—Creativity has been conceptualized as *forming of associative elements into new and useful combinations* (Batey & Furnham, 2006). Early research by Mednick (1962) examined the types of associations people would make to a given category, such as “animal”. Some people had extremely strong associations, but generated relatively few exemplars. Others tended to produce a broader range of exemplars, many of which were less typical associations. Similarly, Eysenck’s associational hypothesis (Eysenck, 1993) proposes that creativity is facilitated when mechanisms that limit the formation of associations are weak. A contemporary associationist model is presented by Schmajuk, Aziz, & Bates (2009).

A testable deduction from the associational theory is that creativity might involve the use of information previously coded as irrelevant: Perhaps creative people have access to original associations because they tend not to screen out “irrelevant details” (Dellas & Gaier, 1970). Indeed, early research showed that creative individuals (and people diagnosed with schizophrenia) were better at identifying items presented in the irrelevant channel of a dichotic shadowing task (Dykes & McGhie, 1976). Similarly, decreased latent inhibition (a measure of the tendency to filter “irrelevant details”) has been demonstrated in more creative individuals (Carson et al., 2003), and to be associated with the trait O (Peterson &

Carson, 2000; Peterson, Smith, & Carson, 2002). Decreased latent inhibition may manifest pathologically in the cognitive symptom “overinclusiveness”, seen in both mania and schizophrenia (Andreasen & Powers, 1974; Burch, Hemsley, Pavelis, & Corr, 2006; Glazer, 2009; Jamison, 1993).

Neuroscientific research has elevated cognitive imagery, or perceptual rather than linguistic processing in creativity (Kosslyn, Ganis, & Thompson, 2001). Indeed, a small positive relationship between use of mental imagery and divergent thinking was found in a recent meta-analysis (LeBoutillier & Marks, 2003). Use of cognitive imagery has also been linked to emotional processing, in that images may be more powerful than words in eliciting and processing emotions (Holmes, Arntz, & Smucker, 2007; Holmes, Crane, Fennell, & Williams, 2007; Holmes, Geddes, Colom, & Goodwin, 2008; Holmes, Lang, & Deepro, 2009; Holmes & Mathews, in press). These researchers have shown that individual differences in the use of imagery are reliably related to increased emotional intensity, and distress disorder diagnoses.

Mood is probably the least disputed predictor of creative behaviour. A large number of studies affirm that, compared with neutral mood, positive affect (exemplified in happiness) is associated with increased fluency and originality (e.g., Fredrickson, 2001; Mumford, 2003). Although it has been suggested that both positively and negatively valenced states might enhance creativity if accompanied by high levels of arousal (De Dreu, Baas, & Nijstad, 2008), this was not supported in a meta-analytic study by the same authors (Baas, De Dreu, & Nijstad, 2008). Rather it appears that positive moods (particularly happiness) are particularly important in promoting creativity. Experimental studies indicated a small positive causal association between positive moods and creativity. The primary link between positive affective states and creative performance was also affirmed in a second recent meta-analysis (Davis, 2009). The effect of positive mood is more clearly observed when original thinking or creative ideation is measured, rather than general problem-solving. Numerous studies suggest that moderate positive affect supports, while low and intense levels of emotion impede creativity (Davis, 2009; De Dreu et al., 2008). It is tempting to suggest that this helps explain the diminished level of creative output among those with mania compared to hypomania (see above).

The link between positive affect and creativity appears to be mediated cognitively via increased associative richness, cognitive flexibility, and fast and global processing (Fredrickson & Branigan, 2005; Hirt, Devers, & McCrea, 2008; Lyubomirsky, King, & Diener, 2005; Pronin & Wegner, 2006). Neurobiologically, this may be due to cortical activation and arousal effects (mediated by dopamine and noradrenaline), particularly of the prefrontal cortex and its working memory functions (e.g., Ashby, Isen, & Turken, 1999; Damasio, 2001; Flaherty, 2005).

3.3.2. Bipolar disorder and the mechanisms of creativity process—Three core features of the creative process — fluency of association, use of cognitive imagery and positive affect are commonly reported in BD. First, bipolar traits are associated with divergent thinking and episodes of mania are associated with the cognitive symptom of overinclusiveness (see Section 3.1 above). Second, reliance on cognitive imagery has been proposed to be a clinically-significant feature of BD (Holmes et al., 2008). Finally, people with BD (Bagby et al., 1996; Lovejoy & Steuerwald, 1995) and those at risk for the disorder (Gruber & Johnson, 2009) tend to experience heightened positive affectivity. Indeed, hypomania and mania have been characterized as abnormal elevations of positive affect (Depue & Collins, 1999; Urosevic, Abramson, Harmon-Jones, & Alloy, 2008). Positive affectivity, a core facet of extraversion, also specifically predicts more severe manic symptoms over time (Akiskal et al., 1995; Egeland, Hostetter, Pauls, & Sussex, 2000; Hecht

et al., 1998). Furthermore, a range of studies indicate a causal relationship between mesolimbic dopaminergic dysregulation and BD (Berk et al., 2007; Cousins, Butts, & Young, 2009). The present review therefore suggests that abnormalities of dopamine function may be a neurobiological substrate shared between BD and creativity process, and that associated positive affective traits may be one component of BD that helps explain creative cognitive styles.

4. An organizing scheme

It can be concluded that BD is related to a number of characteristics that might drive creative accomplishment. An emphasis on high goal setting, and particularly ambitions for public recognition and creative accomplishment, may provide the fuel for pursuing creative accomplishments. Positive affectivity might promote more divergent, creative thinking, and impulsivity may foster production of novel products without self-censorship. Finally, personality traits of N, E and O may promote success and comfort in performance-based creative arts, and particularly careers consistent with Romantic values.

Contained in Fig. 1 below is a provisional model of the relationship between the BD phenotype and the two fundamental components of creativity, viz. generativity/novelty and consolidation/usefulness.

A number of features of Fig. 1 are noteworthy. First, the large number of variables that can be independently forwarded as mechanisms linking BD to creativity is consistent with the range of evidence (Section 2 above) that such an association exists. Second, Fig. 1 suggests that BD may be unambiguously consistent with creativity as generativity, and have a more mixed relationship with creativity as consolidation. Third, while most variables have a positive relationship, there is some domain specificity (N and E) and some relationships are ambiguous (e.g., impulsivity). Fourth, the model does not capture possible dynamic relationships (e.g., creative outputs during elevated states that are grounded in earlier experiences of depression). Finally, the associations represented in Fig. 1 are generally of small-moderate effect size, providing ample room for individual variation across clients. Two important moderators not captured by the model are the degree of depression experienced (Angst & Cassano, 2005), and the level of psychotic symptoms (Craddock, O'Donovan, & Owen, 2006). These two clinical characteristics differ widely within BD, and are relevant for understanding creativity, particularly given the literature on creativity within unipolar depression (Akinola & Mendes, 2008; see also, Shapiro & Weisberg, 1999; Verhaeghen, Joormann, & Khan, 2005) and schizotypal and psychotic disorders (Schuldberg, French, Stone, & Heberle, 1988).

Within its limitations, Fig. 1 acts as a useful initial representation of the multi-faceted links between creativity and BD. In the final sections of this review, we use this framework to introduce a set of considerations for clinicians working with creative-BD populations. The issues presented below are a synthesis of our clinical experience and cognate research; it is hoped that this review will stimulate more specific studies in the area. We commence by considering the possibility that the environmental niche of performers, while engaging and supportive of self-expression, may challenge a BD diathesis.

5. Performance lifestyle as a precipitating or perpetuating factor for mood dysregulation

Some features of the creative professions, particularly artistic performance, may be counterproductive for people with BD. Although not universal components of these careers, five features warrant attention — reinforcement of emotionality, occupational stress,

substance misuse, irregular sleep and activity schedules, and challenges to goal regulation (see also Table 1).

5.1. Reinforcement of emotionality

Emotional sensitivity may promote creativity within the arts, and high levels of *N*index this trait in BD patients and creative people (see Section 3.2). The artistic niche may amplify this disposition, through the reinforcing effects of external reward for expressed emotionality. As discussed by Sass (2001b), artists are valued for their ability to capture, express and engender states of intense emotion. Regular experience and sharing of intense emotions may challenge a preexisting mood regulation vulnerability.

5.2. Life stress

Occupational stress is high among performance artists (Wills & Cooper, 1988; Wills, 2003). Unemployment is endemic: In one study of professional actors in New York City, for example, only 13% averaged more than 30 weeks of work per year over a 4 year period (Kogan, 2002). Likewise, a career path of increasing stability and recognition over time is rare in the performing arts (de Chumaceiro, 2004), with negative consequences for occupational identity and potentially for psychosocial development (Munley, 1975; Skorikov, 2007). Responding to a sentence stem “Most actors' lives are...”, 79% of a sample of actors offered negative descriptions including difficult, frustrated, unpredictable and chaotic (Kogan, 2002). Anxiety is a common comorbidity of BD (Lee & Dunner, 2008) and may be exacerbated by the long-term stress of trying to create a professional career in a highly competitive, under-regulated environment. Moreover, substantial research indicates that negative life events and chronic stressors can predict greater severity of depressive symptoms within BD (Johnson et al., 2008; M'Bailara et al., 2009).

5.3. Substance misuse

In community surveys, as many as 71% of persons with BD meet criteria for a diagnosis of alcohol or substance abuse or dependence during their lifetime (Goldstein & Levitt, 2008; Kessler, McGonagle, Zhao, & Nelson, 1994; Maremmanni, Perugi, Pacini, & Akiskal, 2006). Drugs such as cocaine and speed have been shown to trigger manic episodes (Jacobs & Silverstone, 1986).

Alcohol and drug comorbidity may be particularly prevalent among highly creative bipolar populations. For example, in a sample of 40 bebop musicians, 42.5% warranted a substance misuse diagnosis, compared with 20% in a comparable population sample (Wills, 2003). Not only does the artistic environment support substance use (see Table 1), but substances may, through mood effects, perform an important creativity-enhancing function. Alcohol has been noted as a self-medication for performance anxiety (Fehm & Schmidt, 2006), and cannabis and LSD are commonly used for creative intent (Belli, 2009; Fachner, 2006). In terms of psychosocial treatments, comorbid substance use problems may require separate attention using specialized strategies (Albanese & Pies, 2004; Vornik & Brown, 2006), which go beyond simple combination of the content specific to the two conditions (Conrod & Stewart, 2005; Quello, Brady, & Sonne, 2005).

5.4. Irregular sleep and activity schedules

The creative lifestyle may challenge a core neurobiological diathesis in the circadian system. Circadian rhythm instability plays a causal role in BD (Murray & Harvey, in press) and this vulnerability is moderated by social rhythms (Malkoff-Schwartz et al., 1998; Malkoff-Schwartz et al., 2000). Creative occupations are characterized by abnormal 24 hour activity patterns: Working hours are typically at night, with rehearsals and other engagements

scheduled during the day (Belli, 2009). Exacerbating this instability is work-related travel, including travel across time zones, a known risk for BD relapse (Katz, Knobler, Laibel, Strauss, & Durst, 2002). Physical activity, social engagement and emotional stimulation may swing through peaks and troughs related to project-based work, producing challenges for the medium-term moderation of arousal (Murray, 2010). This high amplitude variation in environmental engagement is largely out of the individual's control because of their dependence on others for the generation of work (Wills, 2003). Each of these factors may interfere with effectively maintaining daily rhythms and sleep schedules. Illicit drugs may be used to help maintain energy levels through this unusual schedule. From a chronobiological perspective, the creative lifestyle may have extremely negative consequences for regulation of circadian function.

5.5. Goal regulation challenges

Abnormal regulation of goal pursuit is common in BD. People with BD (Hayden et al., 2008; Salavert et al., 2007), as well as students with bipolar spectrum disorder (Alloy et al., 2006; Meyer, Johnson, & Carver, 1999) and those at risk for the disorder (Carver & Johnson, 2009; Fulford, Johnson, & Carver, 2008; Meyer, Beevers, & Johnson, 2004; Meyer, Beevers, Johnson, & Simmons, 2007; Meyer, Johnson, & Winters, 2001) have been found to have elevated levels of approach system motivation. One way this appears to be expressed is an increased reactivity to how well the pursuit of goals is going (in both interpersonal and achievement domains). Life events involving success have been found to trigger manic symptoms in BD (Johnson et al., 2008; Johnson et al., 2000; Nusslock, Alloy, Abramson, Harmon-Jones, & Hogan, 2008). People with BD have also been found to experience more frustration after goals are thwarted compared to other people (Wright, Lam, & Brown, 2008). Sadly, creative pursuits often involve long periods of lack of recognition and frank unemployment, frustrations that the person with BD may feel more keenly than others. At other times heights of public recognition and excitement may be destabilizing towards mania.

5.6. Conclusion

In sum, many creative occupations involve features that may increase risk of symptoms for those with BD, including increased rates of stress, alcohol and substance use, extremes of achievement and frustration, and chaotic schedules. Effective treatment planning requires assessment of whether or not these features are of concern at the time of intake, but also over the broader life course. Open discussion of these sensitive issues requires a strong therapeutic alliance, as considered next.

6. Creativity and engagement with treatment

Ambivalence towards treatment is common for people with BD (Leahy, 2007). Here, we focus on how creativity and its associated temperaments and values may interfere with acceptance of the diagnosis and an aversion to the goals of stabilizing mood and “restoring normalcy”.

Acceptance of the BD diagnosis is often an iterative process, with clients returning to the question many times throughout therapy (Newman, Leahy, Beck, Reilly-Harrington, & Gyulai, 2002). Those with less severe forms of the disorder may be more reticent to accept a diagnosis, as by definition, hypomanic periods do not interfere with functioning. Hence, those with milder symptoms may treasure some of the benefits of increased energy, sociability, and faster thinking. It has been suggested that those with cyclothymia, with its fairly constant mood swings, may see their mood fluctuations and sensitivity as part of their personal and social identity, and so be less willing to accept a diagnosis (Akiskal & Akiskal,

2007). Given evidence that creativity is particularly heightened among those with less severe forms of disorder (above), clinicians will likely need to carefully consider the pros and cons of diagnoses for their clients.

It is worth noting that many clients believe that their creative accomplishments are fostered by high periods. Although the sheer volume of output does tend to be higher during manic periods than depressive periods, such work may be of poor quality (Weisberg, 1994), so such beliefs are worth carefully evaluating. As discussed above, creative achievement requires not just spontaneous generation of new concepts, but attention to detail and critical thinking that are impaired (by definition) during periods of mania and hypomania (Schuldberg, 2000). It may be helpful to share with clients evidence that creativity is not specifically related to manic periods, that people with a history of hypomania are more likely to have creative accomplishments than those with mania, and that unaffected family members are more likely to have creative accomplishments than are those with hypomania.

A medical-model assumption of treatment as progression to normality may not be motivating for some creative persons (Rothenberg, 2006). Above, we noted that impulsive expression of emotions and needs can be related to creative accomplishments across science and art, and some clients may have strong views about not wanting to feel constrained. Therapists who emphasize quantifying and defining symptoms may also find these approaches conflict with a Romantic worldview elevating emotion over reason. Given wide variability in the level and types of motivation for treatments, it is recommended that clinicians openly discuss treatment goals as part of the intake process. For some clients, a critical analysis of which components of spontaneity they wish to sustain may be helpful.

From the clinician's viewpoint, patient creativity provides challenges and opportunities. Creativity is highly valued in western culture, and the therapist must be careful not to idealize the client's achievements and capacities. The therapist must also avoid the lay assumption that psychopathology is somehow necessary for creativity. On the other hand, many of the correlates of creativity and BD can be considered strengths. Positive affectivity, a motivation to achieve success, openness to experience, and relatively high energy levels can all foster positive outcomes in the right context.

Having considered the fundamental issue of therapeutic engagement, we next address the implications of creativity for existing evidence-based treatments for BD. To our knowledge, there is no published research into creativity as a potential moderator or mediator of treatment outcome in BD. As a strategy for developing hypotheses, it is useful to consider points of possible match and mismatch between existing treatments and the characteristics of creative-BD presentations (see Fig. 1).

7. Creativity and evidence-based treatments

Medication remains the first line treatment for BD I, but there is growing support for augmenting pharmacotherapy with psychosocial treatments (Goodwin, 2009; Yatham et al., 2006). Four adjunctive psychological treatments for BD have been investigated in some depth: psychoeducation, cognitive behaviour therapy (CBT), family focussed therapy (FFT), and interpersonal and social rhythm therapy (IPSRT). These treatments share core characteristics in format and content (Miklowitz, Goodwin, Bauer, & Geddes, 2008; Scott & Gutierrez, 2004). They are highly structured, based on an explicit stress-vulnerability model, provide a clear rationale for the intervention, and encourage patient self-efficacy through independent use of developed skills. Each of these treatments has been found to reduce hospitalizations, to increase time to relapse, and to specifically diminish depressive symptoms (Frank et al., 1994; Johnson & Fulford, 2009; Miklowitz, Otto, Frank, Reilly-Harrington, Kogan, et al., 2007). Studies also suggest that these treatments help improve

social and occupational functioning (Lam, Hayward, Watkins, Wright, & Sham, 2005; Lam et al., 2003; Miklowitz, Otto, Frank, Reilly-Harrington, Wisniewski, et al., 2007; Miklowitz et al., 2003). Psychoeducation has consistently been found to diminish risk of manic symptoms (Colom et al., 2003; Colom et al., 2009), but evidence regarding the anti-manic effects of the other psychotherapies is more mixed (Castle et al., in press; Johnson & Fulford, 2009; Scott & Gutierrez, 2004).

7.1. Medication

The relationship between creativity and pharmacotherapy for BD is under-researched and poorly understood (Andreasen, 2008). There is some evidence that, on balance, creative output is improved over the long-term by pharmacotherapy. For example, a biographical study of the poet Lowell found a clear pattern of improved creative output under lithium (Hamilton, 1982), as did the seminal Iowa workshop study (Andreasen & Canter, 1974). In both these studies, lithium improved output by decreasing disruptions due to manic and depressive relapses and their sequelae (see Michalak & Murray, 2010).

On the other hand, patients commonly assume that mood-stabilizing medication flattens expression, insight and alertness and that outside frank episodes of illness, prophylactic pharmacotherapy may on balance inhibit creative process (Rothenberg, 2006). Consistent with this assumption, a recent meta-analysis found lithium to diminish associative productivity (effect size=.33). In an earlier study, Schou found that productivity and quality of work among 24 artists was improved by lithium treatment in 12 cases (50%), productivity was unaffected in a further six (25%) and six participants (25%) had lower productivity (Schou, 1979). Taking variable side-effects into account, it has been proposed that outside acute episodes, functioning, rather than complete mood stabilization is the preferred goal (Akiskal & Akiskal, 2005). In the light of this complex and incomplete data, clinicians will do well to consider motivational interviewing as an approach that helps guide the client in a discussion of the pros and cons of pharmacological treatments (Miller & Rolnick, 2002).

7.2. Psychoeducation

Many of the components of psychoeducation would seem applicable for this population. First, most psychoeducation programs provide information about medications, and may help clients make informed decisions about different treatments. Psychoeducation enhances medication adherence in BD (Miklowitz & Scott, 2009), and may be particularly helpful in a population that faces more challenges in considering medications. Second, teaching patients to recognize symptoms of mania may be particularly applicable for this population, as travel schedules may preclude regular monitoring by a professional. Third, most psychoeducation programs include didactic training regarding triggers of symptoms, such as stress, substance abuse, and sleep disruption. Given the prevalence of such triggers in many creative occupations, as described above, such material may be particularly relevant.

A key feature of psychoeducation is its ease of application, and a number of good quality sources of information are freely available on the web. Several self-help manuals have also been developed (e.g., Basco, 2006; Jones, Hayward, & Lam, 2002; Otto et al., 2009) and these may be particularly good resources for those unable to see a therapist on a weekly basis.

7.3. IPSRT

Interpersonal and Social Rhythm Therapy aims to supplement Interpersonal Psychotherapy (Klerman, Weissman, Rounsaville, & Chevron, 1984), a well-validated treatment for depression, with behavioral strategies aimed at increasing stability of social rhythms (Frank et al., 1994). The core aims of this approach, viz., improving the stability of daily rhythms

and proactively addressing threats to rhythmicity (Frank, 2007), should be considered for those whose schedules involve intense travel or sleep disruption.

As part of psychoeducation about social rhythm management, we find it useful to draw an analogy between the endogenous circadian rhythm and the role of the drummer in a band. Just as coordinated self-expression by the band depends on the drummer's rhythm, staying well with BD depends on a stable 24 hour rhythm (Murray, 2010). This metaphor is appealing to clients because it underscores that, i) BD is grounded in a biological adaptation to the earth's rotation, ii) a stable 24 hour sleep/wake cycle is vital to psychological health, and iii) the patient has a role in staying well through maintaining circadian rhythmicity.

7.4. Cognitive behavioral treatment

CBT for BD has received more research attention than any other adjunctive psychosocial treatment. A recent meta-analysis found mixed results across divergent study designs, but concluded that CBT was effective, with the most robust evidence being for the prevention of depressive relapse (Miklowitz & Scott, 2009). Above, we described evidence that N is associated with artistic creativity, as well as being elevated in BD. It is worth noting that N has been found to predict slightly less positive outcome in CBT (Zinbarg, Uliaszek, & Adler, 2008).

Recent applied and basic research suggests some ways that CBT might be tailored for those who are inclined to high emotional intensity. Holmes and colleagues have postulated that BD may involve a reliance on mental imagery (Holmes et al., 2008). Although this work has largely been with cognitive imagery in the visual domain, *auditory* imagery may be potent for musicians, dancers and other performance artists (Holmes, personal communication, Sept 2009). If this hypothesis is supported, it has important implications for how cognitions are approached in CBT for creative-BD presentations.

The therapeutic potential of imagery manipulation in this population is also supported in recent work focusing on long-term cognitive change in BD patients (Ball, Mitchell, Malhi, Skillecorn, & Smith, 2003; Ball et al., 2006). Ball and colleagues have shown that affect-inducing experiential techniques (e.g., Gestalt approaches to role playing, Yontef & Jacobs, 2005) and guided imagery (Young, 1990) can be safely and effectively used to help BD patients reappraise unproductive core beliefs. These experiential approaches to psychotherapy are most suited to those high on O and E (Costa & McCrae, 1992; McCrae & Costa, 1997), and so may be particularly relevant to the creative subgroup.

7.5. FFT

The broad aims of FFT are to improve family communication patterns and to minimize unproductive reactions to the diagnosis and symptoms of BD (Miklowitz et al., 2003). Family-focused therapy has proven most clearly effective in families with high levels of conflict and psychosocial impairment (Miklowitz & Scott, 2009).

How might patient creativity impact on family dynamics and FFT for BD? First, creativity probably runs in families (Reuter, Roth, Holve, & Hennig, 2006; Simeonova et al., 2005), so the characteristics and challenges ascribed above to patients may be mirrored in the family of origin, potentially exacerbating vulnerabilities and stressors. Second, there is some evidence that insecure attachment is elevated in musicians (Costello, 2007), creating a challenge for family-based work. Finally, the career-development problems common to artistic pursuits (Section 5) may be a barrier to financial independence and career momentum, potentially generating family tensions.

7.6. Optimizing psychosocial treatments

In summary, existing research shows that psychosocial interventions hold promise as adjunctive treatments for BD. There is no reason to think that outcomes will be dramatically affected by creativity in the patient, but case formulation and treatment planning will benefit from considering the personality profile, values and environmental challenges that typify such presentations.

Assessments should carefully integrate attention to features of the creative lifestyle that may portend increased risk of symptoms, including potential stressors, substance abuse, challenges to goal regulation, and schedule disruptions. Some features of treatment may need to be modified to enhance outcomes for highly creative people with BD. Among these, clinicians may need to consider barriers to treatment engagement, and to openly discuss individual goals towards treatment engagement. Specific concerns about the influence of medication on creativity must be evaluated, and this may include gathering data with a client on how mood swings influence creative output.

Specific forms of adjunctive therapy may also need to be tailored. For example, psychoeducational programs could provide enhanced content to address the needs of highly creative persons with BD. Better attention could be provided to issues such as the following. Is it true that creativity and BD are linked, and if so does successful management of BD threaten creativity? Does medication for BD decrease creativity and emotionality? Is a career involving disturbed sleep feasible for someone with a bipolar diathesis? Is abstinence the best means of decreasing the detrimental impact of substances on BD?

Similarly, the values and sociocultural context of the creative BD individual should determine the style of presentation of information and the strategies suggested. For some, it may be important to consider how beliefs in the value of intense emotion, personality traits of N and O, and cognitive styles emphasizing imagery will shape the best choice of specific interventions. For some, traits of E may lead to greater comfort with group interventions (Miller, 1991). Some patients may benefit from structured career counselling (e.g., Holland, 1996) to support consideration of occupations that are equally creative, but less challenging to a BD diathesis. Objective social disadvantage should also be considered in prevention/treatment. We have recently shown that occupational therapy is a useful component of an effective treatment for chronic depression, presumably because it targets this vulnerability (Murray et al., 2010).

Ideal interventions would also be tailored to the peripatetic, shift-work lifestyle common in creative pursuits. The internet provides this accessibility across space and time (Marks & Cavanagh, 2009), and is a cheap treatment option for people without health insurance. For other psychiatric disorders, online programs have proven effective as a component in “stepped care” (MacGregor, Hayward, Peck, & Wilkes, 2009), and it is likely that these findings will generalise to BD.

Finally, it has been suggested that one-shot ‘treatment’ may not be the best way to conceptualize psychosocial interventions for BD: BD is a chronic disorder and a chronic disease self-management model may be most appropriate (Miklowitz, 2008; Suto et al., 2010). This model may play to the strengths of the creative person with BD, because chronic disease self-management assumes the capacity to proactively invent solutions to life challenges. In a recent qualitative investigation of the self-management strategies of high-functioning people with BD, we found a meta-theme of “finding my own path” (Suto et al., 2010), and creativity may act as a moderator and mediator of outcomes from a chronic disease management perspective. Indeed, BD patients who are creative may be uniquely placed to generate novel self-management solutions that can be disseminated to the broader

BD population. If creativity is a major part of a patient's self-concept, then therapy may be best viewed as a developmental endeavor, in which self creation and identity consolidation interact to moderate the course of BD (Rothenberg, 2006).

8. Conclusions

Treatment outcomes in bipolar disorder remain unsatisfactory (Nierenberg, 2009). Although adjunctive psychosocial approaches have proven broadly effective in randomized controlled trials, refinement of these interventions is urgently required (Miklowitz, 2008). Here, we outline basic and clinical implications of the link between creativity and BD, and demonstrate how creativity may both moderate and mediate treatment outcomes. For clinical research, the primary outputs of this review are testable hypotheses about creativity as a contextual variable in the targeting of psychosocial interventions. For the clinician, the review offers an account of creativity as one example of the patient characteristics, values and context that must be considered in evidence-based treatment of BD.

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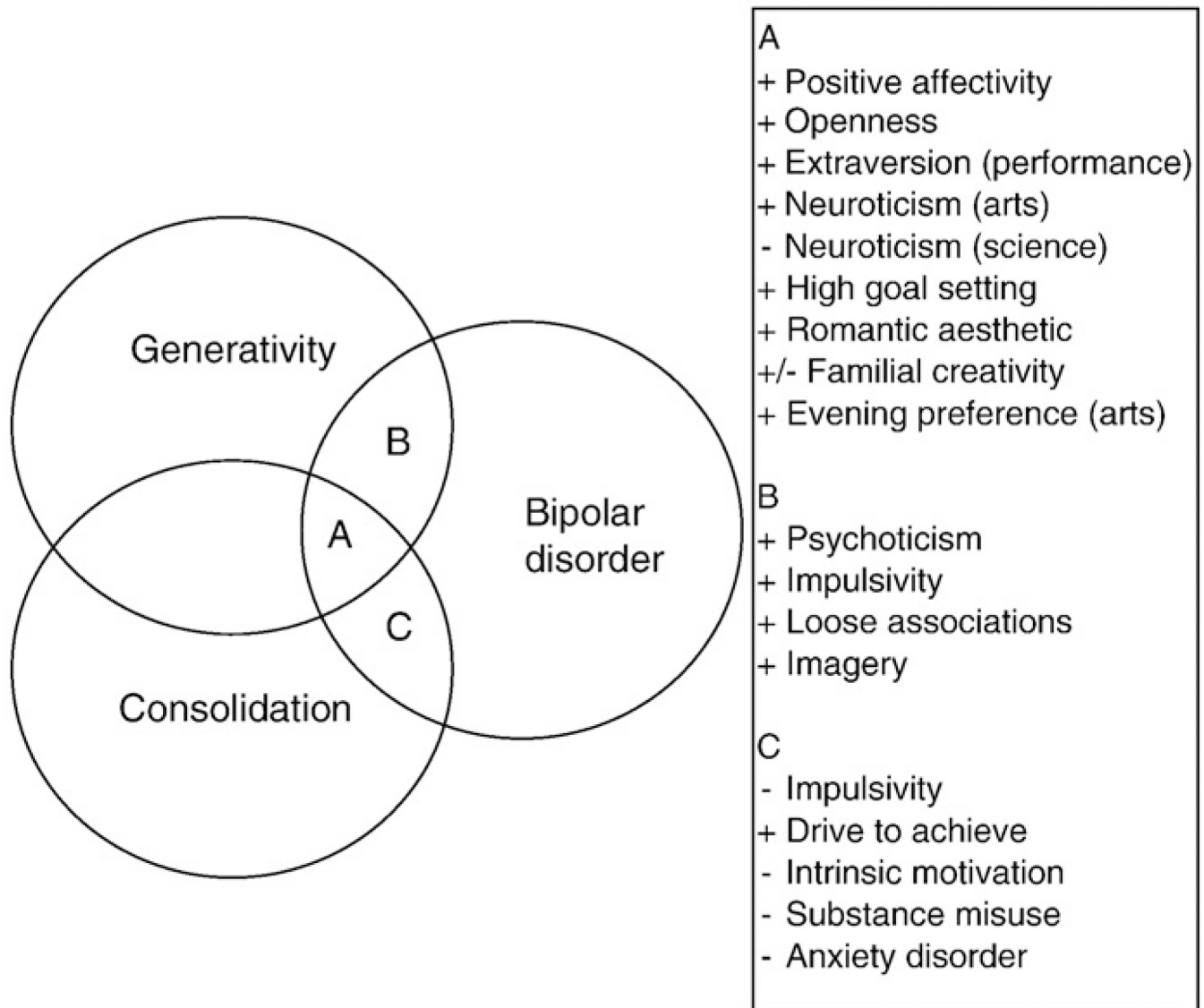
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**Fig. 1.**

Schematic representation between the bipolar disorder phenotype and two core components of creativity. Shown in the embedded box are variables in the three areas of overlap, and the direction of their association.

Table 1

Common characteristics of the performance lifestyle and possible consequences for case formulation and treatment planning.

Generic challenge	Specific environmental feature	Potential psychological consequence	Implications for clinicians
Social reinforcement for emotionality	Performers are rewarded for displaying and generating intense emotion	Ambivalence about moderating emotion	Discuss with client the pros and cons of treatments that encourage moderation and restraint
Marked occupational stressors	Intense competition for career goals	Ambivalent relationship with colleagues (professional jealousies versus support)	Carefully assess strengths and weaknesses of social networks
	Poor remuneration and absence of structured career path	Financial stress, lack of financial independence	Consider objective barriers to quality of life, and involvement of social work
	Absence of insurance benefits (US)	Barrier to accessing professional care	Consider low-cost and self-directed interventions (bibliotherapy, self-help, web-based interventions)
	Dependent relationship with employers, funding bodies, venues	Limited opportunities to practice adult assertiveness skills	Do not assume that common workplace skills have been strongly learned
Substance abuse risks	Alcohol and stimulant availability in work place	Challenge to substance moderation plans	Carefully consider stimulus control strategies
Irregular activity schedules	Extreme variation in activity levels (through project-based work)	Boredom, low behavioural activation	Consider behavioural activation/titration interventions, pleasant activity scheduling
Irregular sleep/wake cycles	Night work, time zone travel	Poor sleep, poor daytime energy, difficulties exercising. Exacerbation of biological rhythm instability	Present quantitative and qualitative data on importance of maintaining regular rhythms and sleep schedules
Challenges to goal regulation	Extreme variation in external feedback	Labile sense of worth	Discuss cognitive strategies to moderate reactivity to external judgments
	Small possibility of very desired life outcomes (famous artist)	“Waiting for life to happen”	Discuss ambivalence about committing to more achievable but less exciting goals
	Unusually strong identification with occupation	Unusually sensitive to frustrations and joys of the occupation	Extreme variability in self-esteem and mood should not be reduced to endogenous causes
	High prevalence of peak experiences and flow states	Low tolerance of euthymia and emotional moderation	Clinician should adjust their therapeutic narrative to accord with client's Romantic values and preferences