Is risk for mania associated with increased daydreaming as a form of mental imagery?

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Abstract

**Background:** Bipolar disorder and risk for mania are associated with setting high goals and dysregulated goal pursuit. One mechanism mediating between setting high goals and manic symptoms could be daydreaming or more generally, mental imagery. ‘Daydreams’ (as one form of mental imagery) are characterized by the fact that the content is produced deliberately. Akiskal et al. (1995) reported that daydreaming prospectively predicted a switch from unipolar depression to bipolar disorder. We here hypothesized that risk for mania should also be associated with increased daydreaming after controlling for depression. **Method:** N = 249 participants from a non-clinical, community sample completed several self-report measures including the Hypomanic Personality scale and Daydreaming scale. **Results:** Hierarchical regression revealed that risk for mania predicted daydreaming after controlling for current and former depression. **Limitations:** Only self-report measures were used. The sample was a non-clinical, primarily White British sample, which has implications for generalisability. **Conclusions:** Despite limitations our results support the hypothesis that vulnerability for mania is associated with daydreaming. Daydreaming was related to mania and depression which highlights that it might be relevant for the etiology or maintenance of mood disorders.

**Keywords:** daydreaming, vulnerability, depression, bipolar disorder, hypomanic personality, mental imagery
Understanding the psychological processes underlying bipolar disorders (BD) and especially mania would help improve psychosocial interventions for BD. So far, psychosocial interventions for BD generally work better for the depressive pole (e.g. Miklowitz & Scott, 2009). One area of interest is the role of setting and achieving goals. Patients with BD, but also those at risk for mania have been shown to have high aspirations, set unrealistically high goals, and to react more strongly to reward and success in the form of higher expectations or self-serving attributions (e.g. Johnson, Eisner, & Carver, 2009; Meyer, Barton, Baur & Jordan, 2010; Meyer & Krumm-Merabet, 2003). Even more compelling, Johnson et al (2000, 2008) found that achieving personally relevant goals prospectively increased risk for developing mania in patients with BD (for review: Johnson, 2005). All these studies show that risk for mania is associated with endorsing and setting higher goals and expectations of one’s own high achievements and this might lead into an upward spiral and finally into mania.

What are the processes that might lead from ‘setting high goals’ into mania? There might be different ways; for instance from a biological point of view, setting high goals might trigger increases in arousal and then lead to mania-related symptoms such as higher activity levels and decreased sleep. Alternatively, setting high goals might increase mental processes specifically related with goal setting and striving. Recently Holmes and Mathew (2010) reviewed the role one form of mental processes, i.e. mental imagery, with respect to emotional disorders such as posttraumatic stress disorder, and depression. They conclude that there is strong evidence that imagery has emotional consequences and that this not only applies to negative affect but also positive affect.

When it comes to personal goals, Conway and colleagues (Conway, 2001; Conway et al., 2004) showed that mental imagery is important for directing behaviours towards achieving these goals. With regard to (hypo-)mania this could mean that setting and/or achieving a
personally relevant goal could trigger images and associated mania-related beliefs of success or even fame (e.g. Holmes, Geddes, Colom, & Goodwin, 2008).

Holmes and Mathew (2010) subsume ‘daydreams’ under mental images ‘in which possible future events are deliberately produced by our own efforts’ (p. 350). Instead of actively pursuing goals, daydreaming is characterized by turning the attention inwards and blocking out the current situation (e.g. Singer, 1981). Daydreaming about achieving personally relevant goals induces positive affect and tends to motivate individuals to strive for their goals (e.g. Klinger, 1990; Singer, 1981). However, there are also documented negative effects of daydreaming such as feeling depressed (e.g. Chung, Langenbacher, Labovt, Pandina, & Moos, 2001; Langens & Schmalt, 2002; Selby, Anestis, Joiner, 2007).

In relation to risk for BD, Akiskal et al. (1995) found in a large sample of patients with a history of unipolar depression (n=559) that three temperament and personality factors predicted the switching from unipolar depression to BD over an 11-year period. One of these factors was increased daydreaming. This suggests that daydreaming is associated with vulnerability to hypomania in unipolar depressed patients. Using a different approach we wanted to test whether daydreaming is a more general part of vulnerability for BD. Therefore we hypothesized that risk for mania will be associated with increased self-reported levels of daydreaming after controlling for current level and lifetime history of depression.

**Method**

**Participants and procedure**

Participants were 321 members of Newcastle University (243 female), recruited via email and postings to participate in an online study. Ethical approval was obtained. After providing informed consent participants logged into a safe and encrypted research website.

**Materials**
**Hypomanic Personality Scale (HPS, Eckblad & Chapman, 1986).** The HPS is a 48 true-false item, self-report measure that has shown good psychometric properties and convergent validity for bipolar disorders (e.g. Hofmann & Meyer, 2005; Jones, Mansell & Waller, 2006; Meyer & Hautzinger, 2001, 2003) and has reliably identified individuals at high risk for developing manic symptoms over time (e.g. Blechert and Meyer, 2005; Kwapil et al., 2000). Cronbach’s alpha in this study was $\alpha= .89$.

**Daydreaming Scale (DS, Akiskal et al., 1995).** We used the factor-analytically derived scale which was found predictive of switching from unipolar to bipolar-II disorder by Akiskal et al (1995). It consists of six items such as ‘I daydream a great deal’ or ‘My daydreams are often about things that will never come true’ using a false/true response format, which were randomly interleaved with HPS items. In a prior unpublished German study (n=113) the reliability was $\alpha= .74$. The pattern of correlations provided first evidence for its validity, i.e. unrelated to sex ($r=.04$), extraversion ($r=.00$), but related to neuroticism ($r=.38$, $p<.001$). Internal consistency was $\alpha= .76$ in the present study.

**Centre for Epidemiological Studies-Depression Scale (CES-D, Radloff, 1977).** The CES-D is a 20-item self-report scale that is commonly used in community samples to assess current depressive symptoms (e.g. Klein et al., 1996; Vieta et al., 2010). The CES-D has adequate psychometric properties and good reliability (e.g. Meyer and Krumm-Merabet, 2003; current study $\alpha= .93$.

**Revised-Depression Screening Questionnaire (R-DSQ, Bätzner, Brömer, Hammelstein, & Meyer, 2006).** The adapted 9-item DSQ assesses a past history of DSM-IV major depressive episode. Each question was rated on a 4-point scale. To determine if someone has a lifetime history of major depression, we only counted definite ‘yes’-answers. A lifetime history of major depression was coded following the rules of the DSM-IV, i.e. if the DSQ sum score $\geq 5$ and included either “depressed mood” or “anhedonia”. Prior studies document its validity and
psychometric properties (e.g. Bätzner et al., 2006; Meyer, Gudgeon, Thomas, & Collerton, 2010).

**Statistical procedure**

A hierarchical regression analysis, using blockwise entry, was used with *daydreaming* being the dependent variable. Predictor variables were entered into the regression based on existing research findings, with known predictor variables or potential confounds entered first being age, sex, current depression (CES-D), and past history of depression (DSQ). This way we controlled for their effects before entering the HPS in Block 2.

**Results**

**Sample description**

Out of the 321 participants, 249 (77.6%) provided data with respect to the variables of interest for this study. These participants did not differ from the remaining 72 subjects who had missing data and were excluded from the analyses with respect to current levels of depressive symptoms, HPS or daydreaming scores, all $t < 1.40$; age group or sex were unrelated as well, all $\chi^2(1) < 0.88$. There was a trend, however, for those with a likely former history of depression to have provided less complete data, 88.3% (83/94) vs. 94.9% (166/175), $\chi^2(1) = 3.82$, $p < .10$.

The final sample was predominantly female (77.9%, $n = 194$). One-hundred-and-fifty-seven (63.1%) were between 19-29 years old, and 147 participants (59%) were currently students. The remaining participants were all University employees (52% having some kind of postgraduate degree; 32% undergraduate degree; 6% other). The vast majority described themselves as ‘White British’ (85.5%). Using the DSQ scoring, 83 cases (33.3%) were likely to have had a history of depression (see also Table 1).
Predicting daydreaming

With five predictor variables the regression model overall accounted for a significant proportion of variance in daydreaming (Table 2). The first block accounted for 13.8% of the variance, with $R^2$ being significant ($R^2 = 0.138; F[4,244] = 9.80, p < .001$). Adding risk for mania to block 2 led to a significant increase in $R^2 (\Delta R^2 = 0.037; F[1,243] = 10.85; p = .001$). The regression model offered a significant fit of the overall data with, $F_{\text{overall}}[5,248] = 10.33; p < 0.001$.

Within block 1 age, current level of depressive symptoms, and a likely former history of depression made unique and significant contributions in predicting daydreaming indicating that younger individuals, presence of current and former depression were associated with more daydreaming. In line with our hypothesis, risk for mania predicted increased levels of daydreaming after controlling for the above listed factors.

Discussion

Based on prior research that bipolar disorder (BD) is associated with elevated and sometimes unrealistic aspirations and goals (e.g. Johnson, 2005) and Akiskal et al.’s finding (1995) that increased daydreaming was one of the factors predicting future hypomanic episodes in unipolar depression, we investigated whether daydreaming is associated with risk for mania as assessed by the well validated Hypomanic Personality Scale (Eckblad & Chapman, 1986). As hypothesized, vulnerability to mania uniquely explained variance in daydreaming, even after controlling for demographic factors, current and former depression.

While Akiskal et al. (1995) followed up a sample of unipolar depressed patients, we used a convenience sample with varying levels of risk for mood disorders. Despite these different approaches, both studies provide support for the hypothesis that risk for mania is
related to increased levels of daydreaming. This phenomenon could be explained by the model proposed by Johnson (2005) that one group of triggers for mania is related to dysregulated goal striving, including setting very high and sometimes unachievable goals. Daydreaming could be one of the processes which mediates between external triggers for high goal setting in vulnerable individuals (e.g. watching the Academy Awards ceremony), increased mania-related beliefs (e.g. ‘I can do that [e.g. acting, hosting such a show] even better’), and related activities (e.g. contacting agents, setting up a Twitter account). A similar idea has been expressed by Holmes et al. (2008) for BD with respect to the more general concept of ‘mental imagery’ which has been shown to play a role in the aetiology and as a maintaining factor in other psychopathologies (Holmes & Mathew, 2010). Based on the idea that daydreaming is a form of ‘mental imagery’, we conceptualized the ‘daydreaming scale’ as a potential proxy measure for it. However, this means we only captured one aspect of mental imagery: the images that are produced deliberately and not unintentional ones (e.g. intrusive images).

Before drawing final conclusions, several limitations have to be discussed: First of all, we relied on an online sample which was predominantly female. This limits generalizability of the results. Using a non-patient study, however, enabled us to look at the association between daydreaming and risk for mania to add to the evidence provided by Akiskal et al. (1995) in their patient study. Second, although measures such as the CES-D and HPS are widely used and well validated, we totally relied on self-rating tools in this study. Former history of depression, in particular, would have been more reliably assessed via structured clinical interviews but this was not feasible at this stage. Last but not least, the brief daydreaming scale used in the present study has been factor-analytically derived from multiple scales (Akiskal et al., 1995) and is not specifically linked to any theoretical model which might distinguish between different facets of daydreaming or even mental imagery. This is of importance since there is recent evidence that different daydreaming styles can
relate differently to functioning and psychopathology (e.g. Dauphin & Heller, 2010; Klinger, Henning, & Janssen, 2009).

Despite these limitations, we believe that the converging results and ideas (e.g. Akiskal et al., 1995; Holmes et al., 2008; Johnson, 2005) strongly suggest to further examine the role of daydreaming and more generally mental imagery for hypomania and mania. Given that there was also a link between depression and daydreaming, it would seem worthwhile to explore more fully the potentially different functions that daydreaming and mental imagery serve for both the manic and the depressive pole. Given the link between goal striving and mania (Johnson, 2005), one next step could be to have a closer look at the content of daydreaming to test whether achievement-related topics and/or personally-relevant goals are predominant. During therapy, bipolar patients often use images in their speech, and Conway et al. (2004) suggest that such images could reflect dysfunctional goals regardless of the specific psychopathology. It might therefore be important to pay more attention to this form of expression and not to dismiss it just as a personal style, as it might convey critical information about the patient’s current underlying mental processes and perhaps, in individual cases, might be a specific early warning sign of relapse.
References


Table 1

Descriptives for current depression, risk for mania and daydreaming

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<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
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<td>Current depression (CES-D)</td>
<td>13.44</td>
<td>10.37</td>
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<td>HPS</td>
<td>15.89</td>
<td>8.63</td>
<td>0-39</td>
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<td>Daydreaming</td>
<td>3.25</td>
<td>1.91</td>
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Notes: CES-D: Centre for Epidemiological Studies – Depression Scale; HPS: Hypomanic Personality Scale
Table 2

Predicting levels of daydreaming by risk for mania

<table>
<thead>
<tr>
<th>R^2</th>
<th>ΔR^2</th>
<th>B</th>
<th>Standard Error</th>
<th>Beta</th>
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**BLOCK 1**

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<td>0.27</td>
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<td>Age Group</td>
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<td>0.24</td>
<td>-.21***</td>
<td></td>
</tr>
<tr>
<td>Current Depression</td>
<td>0.21</td>
<td>0.09</td>
<td>.15*</td>
<td></td>
</tr>
<tr>
<td>Past Hx Depression</td>
<td>0.138*** a</td>
<td>-------</td>
<td>0.52</td>
<td>0.26</td>
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**BLOCK 2**

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<tbody>
<tr>
<td>HPS</td>
<td>0.175*** b</td>
<td>0.037***</td>
<td>0.05</td>
<td>0.01</td>
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</table>

Notes: Current Depression: Score in the Centre for Epidemiological Studies – Depression Scale; Past Hx Depression: former likely history of depression as assessed by the modified Depression Screening Questionnaire; HPS: Hypomanic Personality Scale;

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

a Overall fit: F(4,248)=9.80, p<.001
b Overall fit: F(5,248)=10.33, p=.001