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Cognitive Correlates of Mania Risk: Are Responses to Success, Positive Moods, and Manic Symptoms Distinct or Overlapping?

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Abstract

Several measures of cognitive style have been shown to be elevated among persons diagnosed with bipolar disorder and those at risk for bipolar disorder. Several of these scales capture responses to positive affect, success, and hypomanic symptoms. We had two goals: (a) to use factor analyses to assess whether the constructs within these scales were statistically independent and (b) to examine whether the factors identified uniquely related to mania risk. A cross-national sample of 638 participants completed measures of cognitive style, including the Responses to Positive Affect scale, the Positive Overgeneralization Scale, and the Hypomanic Interpretations Questionnaire. To assess whether these measures might simply reflect more impulsive reactions to positive mood states, participants also completed the Barratt Impulsivity Scale. To measure risk of mania, participants completed the Hypomanic Personality Scale (HPS). Factor analyses suggested seven factors of cognitive style and impulsivity. Four factors uniquely correlated with HPS. That is, risk for mania related to higher scores on separable factors of acting before thinking, being overly positive in interpreting manic symptoms, being overly confident in response to success, and tendencies to dampen positive affect. Current findings suggest the need to consider multifaceted aspects of cognition in refining psychological treatments of bipolar disorder.

Keywords

bipolar disorder; mania; cognition; confidence; attributions

Compared with the extensive literature on psychological facets of depression, considerably less research has examined psychological models of mania. Nonetheless, a set of psychological characteristics has been found to correlate with bipolar disorder and to predict elevations of mania over time (Jones, 2001). Among the many psychological characteristics that have been examined, several researchers have argued that mania is related to elevated sensitivity to rewards (Johnson, 2005). For example, several studies have documented elevated sensitivity to reward on the Carver and White (1994) Behavioral Activation scale among persons with bipolar I disorder (Meyer, Johnson, & Winters, 2001; see Jones, Tai, Evershed, Knowles, Bentall, 2006, for a nonreplication) and those at risk for bipolar disorder (Alloy et al., 2006; Johnson & Carver, 2006; Jones, Shams & Liversidge, 2007; Mansell, Rigby, Tai, & Lowe, 2008; Meyer, Johnson, & Carver, 1999; Meyer & Hofmann, 2005). Salavert and colleagues (2007) have found similar effects using the Sensitivity to Reward Questionnaire (Torrubia, Ávila, Moltó, & Caseras, 2001). Laboratory studies also suggest that people at risk for mania

are especially oriented to reward, showing heightened psychophysiological reactivity to positive stimuli (Sutton & Johnson, 2002) and to barriers to goal attainment (Harmon-Jones et al., 2002). Beyond cross-sectional findings, research suggests that elevated reward sensitivity (Alloy et al., 2008; Meyer et al., 2001), life events related to reward (Johnson et al., 2000; Johnson et al., 2008), and increases in goal pursuit (Lozano & Johnson, 2001) predict increases in manic symptoms. Hence, people prone to mania might be characterized by greater reactivity to reward, and this sensitivity might help explain the course of disorder.

Perhaps related to the issue of reward sensitivity, Johnson (2005) has suggested that mania might be related to unique cognitive profiles related to goal pursuit. Given small successes in the laboratory, persons at risk for mania demonstrate greater elevations in confidence (Eisner, Johnson, Carver, 2008; Stern & Berrenberg, 1979) and goal-setting (Johnson, Ruggero & Carver, 2005), and enhanced detection of positive interpersonal cues (subtly positive facial expressions; Trevisani, Johnson, & Carver, 2008). After positive mood inductions, persons diagnosed with bipolar disorder demonstrate reduced willingness to take computerized advice on a task (Mansell & Lam, 2006), consistent with the idea of greater confidence during goal pursuit. Hence, persons prone to mania might demonstrate elevated cognitive reactions to positive moods and successes, with particular evidence for elevations in confidence and goal setting. Clinical accounts note these cognitive features of mania as well (Lam, Jones, Hayward & Bright, 1999; Newman, Leahy, Beck, Reilly-Harrington & Gyulai, 2002). It has been hypothesized that elevations in confidence and goal setting may fuel increases in activity that contribute to hyper-stimulation and decreased sleep, thereby intensifying early symptoms of mania (Johnson, 2005; Mansell & Pedley, 2008). Consistent with these models, findings of one study suggest that overly positive cognitions about self predict worse outcome in cognitive therapy for bipolar disorder (Lam, Wright, & Sham, 2005).

Several researchers have developed self-report scales to capture the cognitive styles observed in these clinical and research reports. For example, the Responses to Positive Affect scale (RPA; Feldman, Joormann, & Johnson, 2008) captures strategies that might amplify positive moods when they occur. The Hypomanic Interpretations Questionnaire (HIQ; Jones, Mansell, & Waller, 2006) captures strategies that might amplify incipient hypomanic symptoms. A third scale, the Positive Overgeneralization Scale (POG; Eisner, Johnson & Carver, 2008) was developed to capture overly confident responses to successes. People diagnosed with bipolar disorder and those at risk for the disorder obtain higher scores on the RPA (Feldman et al., 2008; Johnson, McKenzie, & McMurrich, in press) as well as the HIQ (Jones, Mansell, & Waller, 2006). Persons at risk for mania have been shown to have elevations on the POG (Eisner, Johnson & Carver, 2008). A growing literature, then, suggests that tendencies toward mania are related to more intense reactivity to rewards, overly positive cognitions about the self and success during positive mood states, and unique strategies for regulating positive mood.

Unfortunately, researchers have tended to examine each of these cognitive variables in isolation. As a consequence, it is impossible to know whether the variables are redundant or make separate contributions to prediction. Mansell and colleagues (2008) developed the Hypomanic Attitudes and Positive Predictions Inventory (HAPPI) scale. Factor analysis supported several negative cognitive dimensions, as well as two cognitive dimensions reflecting a tendency to become activated after success and to lose control after becoming activated. Intriguingly, the latter two scales were independently related to current hypomanic symptoms among undergraduates. A key question is whether multiple cognitive dimensions relate to the risk of mania rather than to current symptoms.

The current study was intended to assess whether these multiple measures of cognitive styles capture separable constructs, and whether these constructs relate to risk of mania in a large

cross-national study. We included measures of responses to positive affect (RPA), responses to success (POG), and responses to hypomanic experiences (HIQ). Because items on the Barratt Impulsivity Scale that capture a tendency to act without thinking have been related to bipolar disorder (Swann et al., 2004) and might fuel being overly reactive to positive emotions, we also included the Barratt Impulsivity scale (BIS). Our first goal was to use factor analyses to assess whether the constructs within these scales were statistically independent. Another concern is whether these differential responses to positive moods and hypomanic symptoms might merely reflect the presence of more intense moods. To control for this, we examined whether the factors identified uniquely related to mania risk after controlling for current hypomanic symptoms. Because we were interested in gathering a large enough sample to conduct factor analyses, this study focused on risk for mania rather than diagnosable disorder. To assess risk for mania, we used the Hypomanic Personality Scale, a measure with extremely strong validity for predicting diagnoses of bipolar disorder (Kwapil et al., 2000). We felt that the validity of this focus on an analog sample, although not without its drawbacks (Coyne, 1994), was bolstered by positive findings for the RPA, the HIQ, and the BIS that have been obtained with both at-risk and diagnosed samples. To enhance the generalizability of findings, data were gathered in the United States and in England. We note that this study was focused on responses to success, positive affect, and hypomanic symptoms, and we did not include measures of cognitive responses to negative moods that have also been found to relate to bipolar disorder (Alloy, Reilly-Harrington, Fresco, Whitehouse, & Zechmeister, 1999).

Method

Participants and Procedures

Data were gathered at two sites: the University of Manchester and the University of Miami. At both sites, research was conducted into accordance with ethical approval received from the University Ethical Committee/Institutional Review Board.

At the University of Manchester, measures were completed online by a convenience sample of students and staff of the university. That is, an e-mail describing the study was forwarded to approximately 20,000 students and 3,000 staff with a link to the study Web site. The data from the Web site was stored in a password-protected database on a secure server that was IP address restricted (it could only be accessed from certain computers). Only the server administrator had access to the database on the server. After accessing study information and providing informed consent, participants completed the measures below in a random order. The 205 Manchester participants (71.9% female) reported a mean age of 30.34, $SD = 1.36$, median = 27. In previous research, similar correlations between the HIQ and the HPS were observed in samples that completed measures online versus on paper (Jones & Day, 2008; Jones, Mansell, & Waller, 2006).

At the University of Miami, participants were undergraduates who were earning credit toward a course requirement. They completed measures in group sessions, along with several other measures not relevant to this paper. Of the 433 Miami participants, 60% were female. Almost all participants were 18 to 22 years of age, but actual age was not gathered in Miami.

In both samples, to provide a check on whether persons were answering questions carefully, “catch” items were inserted periodically. That is, two items simply stated “code two for this item” and “please leave this item blank on the answer sheet.” The data from the 22 persons who failed to answer at least one of these items correctly were excluded from analyses. At both sites, all participants were provided with referral information to local counseling services. The final sample was 638 participants (414 female; ethnicity information was not collected on this sample.)

Measures

Descriptive information for each scale is provided in Table 1. As can be seen, means were within an expected range, with adequate variability and internal consistency for all measures, except the Barratt Impulsiveness scales for which the latter was low.

Hypomanic Personality Scale (HPS)—The HPS (Eckblad & Chapman, 1986) is a widely used self-report questionnaire designed to capture risk for manic and hypomanic episodes. Although the name implies chronically high states, the scale contains 48 true-false items that assess periodic shifts in emotions (e.g., “When I feel an emotion, I usually feel it with extreme intensity”), behavior (e.g., “I have often persuaded groups of friends to do something really adventurous or crazy”), and energy (e.g., “There have often been times when I had such an excess of energy that I felt little need to sleep at night”). In the initial validation study, 78% of persons scoring more than two standard deviations above the mean were found to meet criteria for mood disorders, as compared with 0% of those with low scores on the HPS (Eckblad & Chapman, 1986). HPS scores have also been found to predict risk for *DSM-IV* bipolar disorders in a 13-year follow-up study (Kwapil et al., 2000). The scale correlates well with reward responsivity scales (Meyer et al., 1999) and cognitive facets of mania (Eisner, Johnson, & Carver, 2008; Trevisani, Johnson, & Carver, 2008). The HPS has high internal consistency ($\alpha = .87$) and good 15-week test-retest reliability ($r = .81$; Eckblad & Chapman, 1986).

Positive generalization (POG)—The POG (Eisner, Johnson, & Carver, 2008) was designed to assess a range of ways in which people might over-generalize from successes. Each item refers to a positive event, and then portrays a generalization from that event to the respondent's broader self-confidence. Response options ranged from 1 (*I disagree a lot*) to 4 (*I agree a lot*). The scale includes three factor-analytically derived subscales. Lateral generalization items are designed to capture the tendency to generalize from a success in one domain to success in other areas of life (six items, e.g., “When something good happens to me, it makes me expect good things in other parts of my life too”). Upward generalization items are designed to capture the tendency to generalize to more lofty goals in the same domain (five items, e.g., “If someone praises the way I express something, it makes me think I can write a popular book”). Social generalization items are designed to capture the tendency to generalize from a small social success to a larger one (five items, e.g., “All it takes is one look from someone and I know that person is falling for me”). In previous research, POG subscales were unrelated to history of depression, but risk for mania correlated with each subscale, and particularly with upward generalization (Eisner et al., 2008).

Responses to Positive Affect (RPA)—The RPA (Feldman et al., 2008) is a self-report measure designed to assess cognitive responses to positive affective states. Participants are asked to rate each response listed on a scale of 1 (*almost never respond in this way*) to 4 (*almost always respond in this way*). There are three factor-analytically derived subscales: Dampening (8 items, e.g., “Think about things that could go wrong”); Self-focused Positive Rumination (four items, e.g., “Think about how proud you are of yourself”); and Emotion-focused Positive Rumination (five items, e.g., “Think about how happy you feel”). Items on both the Emotion-Focused Positive Rumination scale and the Self-Focused Positive Rumination scale capture responses that are expected to intensify positive feelings, and both subscales have been found to demonstrate expected positive correlations with vulnerability to hypomania (Feldman et al., 2008) and with diagnoses of bipolar disorder (Johnson, McKenzie, & McMurrich, in press). Items on the Dampening scale capture responses expected to diminish positive feelings, and this subscale has shown expected correlations with measures of depression history and risk for mania, perhaps due to the need to regulate positive affect in this population (Feldman et al., 2008; Johnson, McKenzie, & McMurrich, in press).

Hypomania Interpretations Questionnaire (HIQ)—The HIQ was designed to capture cognitive biases that might fuel increases in mania (Jones, Mansell, & Waller, 2006). This questionnaire covers 10 hypomanic symptoms (e.g., “my thoughts were coming so thick and fast that other people couldn’t keep up”). For each symptom, participants are asked to rate the intensity of two types of appraisals: (a) Positive self-dispositional appraisals (HIQ Hypomanic Scale; HIQ-H; 10 items, e.g., “I am full of good ideas and others are too slow”) and (b) Normalizing appraisal (HIQ Normalizing Scale; HIQ-N; 10 items, e.g., “There are too many demands on my time.”). For each of the 10 symptoms, participants are asked to rate both types of appraisal on a scale ranging from 1 (*not at all*) to 4 (*a great deal*). Of the participants, 584 completed 10 yes/no items to assess whether they experienced each symptom in the past 3 months, which were summed to provide a measure of current hypomanic symptoms (HIQ Experience). The HIQ appraisal scales have good strong internal consistency, $\alpha_{\text{HIQ-H}} = 0.83$, $\alpha_{\text{HIQ-N}} = 0.73$, and adequate 8-week test-retest reliability, $r_{\text{HIQ-H}} = 0.56$, $r_{\text{HIQ-N}} = 0.59$; Jones, Mansell & Waller, 2006).

Barratt Impulsivity Scale, version 11 (BIS-11)—The BIS-11 (Patton, Stanford, & Barratt, 1995) is the most widely used measure of impulsivity. Scores have been found to be elevated among persons with a history of mania and those with current mania (Swann et al., 2004). The scale comprises 30 items with responses made on a scale from 1 (“rarely/never”) to 4 (*almost always/always*). Patton et al. (1995) reported six first-order factors, which aggregated into three second-order factors. Attentional impulsiveness reflects difficulty in concentrating (eight items, e.g., “I don’t pay attention”). Motor impulsiveness reflects restlessness, poor concentration, and lifestyle changes (11 items, e.g., “I ‘squirm’ at plays or lectures, I change residences”). Nonplanfulness reflects failing to take the future into consideration (11 items, e.g., “I am a careful thinker” [reversed] and “I plan tasks carefully”).

Results

All analyses were conducted using SPSS, version 15. Before conducting analyses, univariate distributions were examined for normalcy and for outliers. As variables approximated normalcy, no transformations were conducted. All analyses were conducted in the combined British/US sample.

Missing Value Imputation

After removing the 22 persons who failed to answer “catch” items correctly, missing value imputation was conducted using SPSS (Hill, 1997). Expectation Maximization (EM) involves two steps that are iteratively repeated to obtain maximum likelihood estimates of missing data; the first step (expectation step) starts with initial parameter values to generate regression coefficients based upon correlations of all available data. These regression coefficients are then used to impute missing values. After all missing data have been imputed, the second step (the maximization step) involves recalculating the parameter estimates. These new estimates are then used as the starting values for iterative repetitions of the expectation step. New regression coefficients are estimated, and these are used to create new imputations. Compared with pairwise deletion or mean substitution, EM has the advantage of preserving the *n*, SDs, and correlation coefficients among variables. Prior to imputation, 6.8% of the cases were missing data on at least one variable. Missing value imputation was not conducted with the HIQ Experience subscale due to the categorical format of these items.

Factor Analysis

Factor analysis using principal component analysis with varimax rotation was conducted. Varimax, the most commonly used form of rotation, maximizes the tendency for each item to be associated with one or a small number of factors, which allows for greater ease in

interpretation. All of the items from the cognitive and impulsivity measures (the POG, RPA, HIQ, and BIS-11) were included. The items from the two symptom measures, HIQ Experience and HPS, were not included. The initial model included 21 factors, but examination of the scree plot suggested seven primary factors, each with eigenvalues above 2. Each of the seven eigenvalues was above thresholds computed using Horn's parallel analyses (O'Conner, 2000). Analyses were conducted constraining to seven factors. Items were eliminated in iterative models if the item loaded with a similar magnitude on multiple factors or the item failed to load sufficiently on any one factor (i.e., loading less than .30). Based on these criteria, 75 of the original 84 items were retained.

The final model accounted for 38.01% of the total variance, and each factor obtained an eigenvalue > 1. As shown in Table 2, the first factor included POG items about responding to a success with extremes of confidence (Factor I: Overconfidence). The second factor included BIS items related to not thinking before acting or speaking, and items related to being easily bored (Factor II: Acting Before Thinking). The third factor contained BIS items related to being careful and controlled (Factor III: Carelessness), along with enjoyment of puzzles and complex problems. The fourth factor included RPA items related to dampening positive affect (Factor V: RPA Dampening). The fifth factor included items from the RPA related to a tendency to focus and magnify positive emotions (Factor IV: Emotion-focused Positive Rumination). The sixth factor included HIQ items about healthy attributions for symptoms (Factor VI: Normalizing Attributions for Symptoms). The seventh factor included HIQ items about overly positive attributions for symptoms (Factor VII: Overly Positive Attributions for Symptoms). As shown, internal consistency for the factors ranged from .67–.91.

Correlations

Correlations were examined of the factor scores with the HPS and the HIQ Experience scales (see Table 3). To examine potential confounds, we also considered whether factor scores were related to gender or country of origin. Men obtained higher scores on the Overconfidence Factor and lower scores on the Emotion-Focused Positive Rumination and Normalizing Attributions for symptoms than did women. Compared with the U.S. sample, the UK sample was more likely to endorse high scores on Carelessness and Overly Positive Attributions for Symptoms and less likely to endorse high scores on the Overconfidence factor.

As shown, people with higher HPS scores were significantly more likely to endorse dampening positive affect as well as making overly positive attributions about symptoms on the HIQ. The HPS also demonstrated significant, albeit smaller correlations with the POG Overconfidence factor, the BIS Carelessness factor, and the BIS Acting Before Thinking factor. The HIQ Experience scale demonstrated modest but significant correlations with each of the seven factor scores. Because country of origin (location) and gender were correlated with factor scores, we controlled for these potential confounds in regression analyses, summarized next.

Regression

Our final goal was to consider whether the factors identified correlated with a measure of risk for mania after controlling for current symptoms. That is, we were concerned about whether any pattern of findings was merely a state-dependent effect. To examine whether these scales uniquely related to the HPS after controlling for recent symptoms, country of origin (location), and gender, we conducted a multiple regression. In the first block, HIQ Experience scores, gender, and location were entered simultaneously, $r^2 = .22$, $F(3,580) = 54.32$, $p < .0005$. Then stepwise regression was used to examine which of the factor scores was related to the HPS after controlling for these confounds. Condition indices were well below 15 (range 1 to 8.81), suggesting no difficulties with collinearity. The total model accounted for 45% of the variance in the HPS, $r = .67$, $F(7, 576) = 66.68$, $p < .0005$. As shown in Table 4, after accounting for

HIQ Experience scores, gender, and location, the HPS was related to greater endorsement of Acting Before Thinking, Overconfidence, Overly Positive Attributions about Hypomanic Symptoms, and Dampening Positive Affect factors.

Discussion

We assessed a large cross-national sample to examine cognitive measures that have been previously related to mania: a measure of overconfidence after success (POG), a measure of responses to positive emotions (RPA), a measure of attributions for hypomanic symptoms (HIQ), and a measure of impulsivity (BIS-11). The goals of the study were to examine whether these measures captured independent dimensions, and whether these independent dimensions could be uniquely related to a scale measuring mania risk. Factor analyses suggested that these measures capture seven separable dimensions that mirrored the original subscales. These findings extend previous research demonstrating that there may be multiple facets of overly positive cognition. More specifically, in a previous factor analysis of a single measure of cognitive style, two cognitive styles, a tendency to become activated after success and to lose control after becoming activated, were separable from each other and from more negative cognitive styles (Mansell et al., 2008). Current findings, based on more scales covering broader content, suggest that there may be even more facets of cognitive styles related to mania risk. Four of the cognitive factors identified uniquely correlated with the HPS, a measure of risk for mania, even after controlling for gender, study location, and current symptoms. That is, risk for hypomania appeared to be related to separable factors of acting before thinking, being overly positive in interpreting hypomanic symptoms, being overly confident in response to success, and tendencies to dampen positive affect. Rather than a model of a single cognitive or coping variable that relates to hypomania, it appears important to consider a set of ways in which people may overreact to internal impulses, successes, and early manic symptoms.

Overall then, it would appear that there are multiple dimensions related to risk for hypomania. The complexity of this pattern suggests that mania is not related to a single discrete cognitive dimension. Clinically, this fits with observations of the broad array of cognitive distortions reported by patients and described in current treatment manuals (Lam, Jones, Hayward, & Bright, 1999; Newman et al., 2002).

At first glance, findings that those at higher risk described more tendencies to dampen positive affect appear counter-intuitive. However, this same direction of effect has been observed in previous research (Johnson, McKenzie, & McMurrich, in press) and might just reflect a need to down-regulate affect given the heightened levels of positive affect observed in this population (Bagby et al., 1996; Lovejoy & Steuerwald, 1995). On the other hand, it is worth noting that previous research has suggested that dampening is related to higher levels of depression (Feldman et al., 2008). Hence, it is not clear whether dampening is an adaptive or maladaptive strategy for people with a history of hypomanic symptoms.

Some aspects of the current findings were not consistent with previous research. For example, factors we identified for the BIS scale were not consistent with those identified in previous research, which has suggested higher order factors of motor impulsivity, nonplanful impulsivity, and attentional impulsivity. One BIS factor in this study, Acting Before Thinking, included items that have loaded on motor and attention impulsivity scales in the past (Patton, Stanford, & Barratt 1995). A second BIS factor, Carelessness, included items that have loaded on nonplanfulness and cognitive complexity scales in the past. The differential pattern in our sample is not surprising given that we tested a relatively homogeneous group of university students and staff, and that we included more measures. Previous studies using the original BIS higher order factors have found that mania is related to each of the original BIS higher order factors, rather than identifying a more specific profile of impulsivity (Swann et al.,

2004). The current analyses, though, suggested that Acting Before Thinking was robustly related to mania risk, whereas Carelessness was modestly related to a decrease in mania risk scores. That is, current results suggest that people at risk for mania report more difficulty controlling behavioral than cognitive impulsivity. Further replication is needed to examine this potential profile of the types of impulsivity that are most relevant for understanding mania risk.

Beyond the factor analyses, we should note that the RPA items about focusing on and magnifying positive emotions did not correlate with the HPS, despite correlations of these items with the HPS in previous research (Feldman et al., 2008). The original factor differed from the one obtained in the current study in that it contained an item that might be particularly relevant for hyperactivation (“Think about how you feel up for everything”). It remains possible that the original factor may relate to HPS scores more robustly than did the current factor solution. Again, further replication is warranted.

HIQ normalizing attributions were not related to hypomania risk in the current study. This is consistent with modest links between this score and mania risk in previous research (Jones, Mansell and Waller, 2006). The lack of relationship between hypomania risk and use of normalizing appraisals suggests that those at increased risk were just as able to recruit these appraisals as other participants.

Finally, it is worth noting that scale scores were related to several confounds, including gender, sample location, and current symptoms. Current findings controlled for such confounds before examining links with hypomania. It may be important to consider these as well as other potential confounds in future research.

Before considering the implications of the current study, it is important to acknowledge several methodological issues. These include the reliance on a self-report measure of mania risk, rather than clinical diagnoses. It is worth noting that our findings are consistent with previous findings that documented elevations on the HIQ, the BIS, and the RPA among those diagnosed with mania (Johnson, McKenzie, & McMurrich, in press; Jones, Mansell, & Waller, 2006; Swann et al., 2003). The absence of data on ethnicity, socioeconomic status, and comorbid conditions prevent us from assessing whether current findings generalize across different demographic and clinical groups. This is particularly important for understanding the role of comorbid impulse control disorders. It is also of concern that cognitive and impulsivity items were only assessed using self-report, and that this may magnify the correlations with the HPS, another self-report measure. Impulsivity findings must be interpreted cautiously, as our factor analysis did not confirm previously obtained factors for the BIS. In addition, the current study does not shed light on other important outcomes in bipolar disorder, such as depression and quality of life. Finally, of particular concern, no prospective data are available to examine whether these variables predict manic symptom exacerbations. Previous research suggests that overly positive views of self predict a more severe course of manic symptoms (Lam, Wright, & Sham, 2005), but no research has examined how a multifaceted cognitive model can predict the course of manic symptoms.

In sum, there is a need for prospective research using a broader cognitive battery to predict the onset and course of mania over time in a diagnosed sample. We believe that it will be important to conduct such prospective research, as better cognitive models are needed to guide treatment development. At the current time, mixed results have been obtained regarding the efficacy of cognitive therapy in the treatment of mania (Lam et al., 2005; Scott et al., 2006). More refined data on the cognitive features associated with mania and mania risk might help the field to build better intervention strategies. One lesson emerges from the current findings, which is that it may be necessary to target a host of cognitive variables. It is hoped that research can begin

to examine whether a multifaceted cognitive assessment can help to identify those at risk for disorder onset and for symptoms.

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Table 1

Descriptive Statistics for Key Measures

Scale	Alpha	Possible Range	Mean (Standard Deviation)
HPS	.85	0–48	18.15 (8.27)
POG social	.93	1–4	3.12 (.65)
POG lateral	.80	1–4	2.04 (.57)
POG upward	.78	1–4	2.88 (.69)
RPA emotion focus	.77	1–4	2.74 (.63)
RPA self-focus	.75	1–4	2.40 (.67)
RPA dampen	.83	1–4	1.87 (.59)
HIQ hypomanic	.83	10–40	22.29 (5.78)
HIQ normalizing	.73	10–40	24.61 (4.87)
HIQ experience	.74	0–20	10.64 (3.09)
BIS attention	.65	1–4	2.14 (0.46)
BIS motor	.55	1–4	2.04 (0.36)
BIS nonplanfulness	.50	1–4	2.37 (0.37)

Note: SD = Standard Deviation; BIS = Barratt Impulsivity Scale, version 11; HIQ = Hypomanic Interpretations Questionnaire; HPS = Hypomanic Personality Scale; POG = Positive Overgeneralization Scale; RPA = Responses to Positive Affect Scale.

Table 2

Factor Loadings for Cognitive and Impulsivity Scale Items (N = 630)

	Component						
	1	2	3	4	5	6	7
<i>Overconfidence</i> (alpha = .91)							
POG When I do well at something I'm trying to do, it makes me feel that I'll be a success at everything in life.	.76						
POG When someone admires me, I believe I could become famous.	.74						
POG When I have a small financial success, it makes me believe I could become a millionaire.	.74						
POG When I made my first friend in this town, I knew I was destined to be a big success socially.	.71						
POG When someone compliments me about something I've said, it makes me think about impressing lots of other people.	.71						
POG When one thing goes right, it makes me feel my possibilities are limitless.	.69						
POG All it takes is one look from someone and I know that person is falling for me.	.69						
POG When someone praises me for my efforts in a club or organization, it makes me think of being the head of the organization.	.66						
POG After one date goes well, it makes me think that person will be in love with me forever.	.66						
POG When people laugh at my jokes, it makes me think I could be a good talk-show host.	.64						
POG When an attractive person smiles at me, I can tell it means he or she is hot for me	.63						
POG When people agree with me after I speak up in a group, it makes me think I could be elected to public office.	.60						
POG If someone praises the way I express something, it makes me think I can write a popular book.	.57						
POG Having a single success makes me think of other successes.	.49						
POG If I succeed at something, it makes me feel I will succeed in other areas as well.	.43						
<i>Acting before Thinking</i> (alpha = .77)							
BIS I act on impulse.		.71					
BIS I act on the spur of the moment.		.64					
BIS I say things without thinking.		.64					
BIS I do things without thinking.		.64					
BIS I am restless at the theater or lectures.		.58					
BIS I don't pay attention.		.56					
BIS I squirm at plays or lectures.		.51					
BIS I buy things on impulse.		.45					
BIS I often think about extraneous thoughts when thinking.		.41					
BIS I change hobbies.		.41					
BIS I get easily bored when solving thought problems.		.37					

	Component						
	1	2	3	4	5	6	7
BIS I spend or charge more than I earn.							
<i>Carelessness</i> (alpha = .75)							.36
BIS I am a careful thinker.			.69				
BIS I am a steady thinker.			.68				
BIS I am self-controlled.			.63				
BIS I concentrate easily.			.60				
BIS I am future oriented.			.54				
BISI plan trips well ahead of time.			.50				
BIS I plan for job security.			.50				
BIS I like puzzles.			.47				
BIS I save regularly.			.46				
BIS I like to think about complex problems.			.45				
<i>Dampening Positive Affect</i> (alpha = .81)							
RPA Remind yourself that these feelings won't last.				.81			
RPA My streak of luck is going to end soon.				.78			
RPA Think about things that could go wrong.				.74			
RPA Think about the things that have not gone well for you				.69			
RPA Think I don't deserve this.				.63			
RPA Think people will think I am bragging.				.57			
<i>Emotion-focused Positive Rumination</i> (alpha = .77)							
RPA Think about how happy you feel.					.74		
RPA Savor this moment.					.70		
RPA Think about how strong you feel.					.66		
RPA Notice how you feel full of energy.					.66		
RPA Think about how proud you are of yourself.					.54		
RPA Think I am getting everything done.					.54		
<i>Normalizing Attributions for Symptoms</i> (alpha = .71)							
HIQ If thoughts coming thick and fast, think I have too many demands							.70
HIQ If sped up inside, think I am under pressure							.66
HIQ If physically restless and kept moving, think I need a break							.63
HIQ If thoughts too fast, think there are too many competing tasks							.61

Component							
	1	2	3	4	5	6	7
HIQ If impulsive, think there are lots of external demands						.59	
HIQ If on the go, think I am overdoing it						.56	
HIQ If thinking was very quick and clear, think there are few distractions at present						.38	
HIQ If things seemed more vivid, think this will pass						.33	
Overly <i>Positive Attributions for Symptoms</i> (alpha = .67)							
HIQ If physically restless and kept moving, think I am full of energy and raring to go							.64
HIQ If sped up inside and good spirits, think can take on challenges							.60
HIQ If on the go, think I have more stamina							.59
HIQ If woke up earlier full of energy, think I am a happy person							.57
HIQ If impulsive, think I can make rapid decisions							.53

Table 3

Correlations of Factors with Gender, Country, HPS, and HIQ Mania Experience Subscale (N = 630)

	Gender	US or UK	HIQ	HPS
Overconfidence	.20**	-.27**	.20**	.32**
Act before thinking	.10*	-.14**	.19**	.44**
Emotion-focused positive rumination	-.19**	-.03	.09*	.04
Carelessness	-.02	.42**	-.14**	-.12**
Dampen positive affect	.08*	.09*	.09*	.13**
Overly positive attributions for symptoms	.08*	.27**	.17**	.22**
Normalizing attributions for symptoms	-.21**	-.03	.12**	-.01

Note: HIQ = Hypomanic Interpretations Questionnaire Experiences subscale; HPS = Hypomanic Personality Scale. For gender, female was coded 1 and male was coded 2; U.S. was coded as 0 and UK was coded as 1. Two persons were missing data for gender. HIQ data were available only for 584 persons.

* $p < 0.05$,

** $p < 0.01$.

Table 4

Regression Model of Cognitive Scales as Predictors of the HPS After Controlling for Current Mania (HIQ Experience Scores), Location, and Gender (N = 584)

	R ² change	Standardized Beta	t	p
<i>Block 1</i>	.22			
Constant			14.70**	0.000
HIQ experience		.26	7.62**	0.000
U.S. or U.K.		-.14	-4.12**	0.000
Gender		-.04	-1.21	0.228
<i>Block 2</i>				
Act before thinking	.12	.39	12.09**	0.000
Overconfidence	.05	.23	6.94**	0.000
Overly positive attributions	.04	.21	6.42**	0.000
Dampen positive affect	.02	.13	4.19**	0.000

**
p < .005.