

Published in final edited form as:

J Affect Disord. 2012 December 15; 142(1-3): 275–282. doi:10.1016/j.jad.2012.05.015.

The dominance behavioral system and manic temperament: Motivation for dominance, self-perceptions of power, and socially dominant behaviors

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Abstract

The dominance behavioral system has been conceptualized as a biologically based system comprising motivation to achieve social power and self-perceptions of power. Biological, behavioral, and social correlates of dominance motivation and self-perceived power have been related to a range of psychopathological tendencies. Preliminary evidence suggests that mania and risk for mania (manic temperament) relate to the dominance system.

Method—Four studies examine whether manic temperament, measured with the Hypomanic Personality Scale (HPS), is related to elevations in dominance motivation, self-perceptions of power, and engagement in socially dominant behavior across multiple measures. In Study 1, the HPS correlated with measures of dominance motivation and the pursuit of extrinsically-oriented ambitions for fame and wealth among 454 undergraduates. In Study 2, the HPS correlated with perceptions of power and extrinsically-oriented lifetime ambitions among 780 undergraduates. In Study 3, the HPS was related to trait-like tendencies to experience hubristic (dominance-related) pride, as well as dominance motivation and pursuit of extrinsically-oriented ambitions. In Study 4, we developed the Socially Dominant Behavior Scale to capture behaviors reflecting high power. The scale correlated highly with the HPS among 514 undergraduates.

Limitations—The studies rely on self-ratings of manic temperament and dominance constructs, and findings have not yet been generalized to a clinical sample.

Conclusions—Taken together, results support the hypothesis that manic temperament is related to a focus on achieving social dominance, ambitions related to achieving social recognition, perceptions of having achieved power, tendencies to experience dominance-related pride, and engagement in social behaviors consistent with this elevated sense of power.

Keywords

Mania; Manic temperament; Dominance motivation; Power; Bipolar disorder

1. Introduction

Bipolar disorders are among the most severe of psychiatric disorders, with rates of hospitalization, divorce, unemployment, and suicide that far exceed those in the general

Conflict of interest

The authors have no conflicts of interest to report.

population (Angst et al., 2002; Mitchell et al., 2004). Although bipolar disorder is rooted in biology, an important goal has been to integrate the biological, psychological, and social aspects of the disorder. In this paper, we examine the idea that mania relates to dysfunctions in the social dominance system, and that these dysfunctions can be observed among those with propensities toward mania. This idea is somewhat related to the view that mania reflects a dysfunctional approach system (for review see Johnson et al., 2012a), but it focuses more specifically on the aspect of approach that is concerned with approach of social dominance.

The dominance behavioral system is related to motivation to pursue power and also self-perceptions of having attained power. Research has identified separable biological, social, and emotional correlates of dominance motivation and power (Archer, 2006; Keltner et al., 2003). Both dominance motivation and self-perceptions of power have also been found to be important in a range of psychopathologies (Johnson et al., 2012b). Despite burgeoning literature in these diverse contexts, dominance motivation and self-perceptions of power have received relatively little exploration in the literature on mania.

2. The dominance behavioral system and mania

Findings from animal research suggest that it may be useful to examine the dominance behavioral system in relation to mania (see Malatynska and Knapp, 2005). In a typical animal study, dominance is measured by competition at a feeder among food-deprived rats. Dominant rats display a set of behaviors in this context that overlap with the symptoms of mania, including high energy and motor activity, intense pursuit of incentives (food), and aggression. Also of interest is that dominance behavior in this paradigm is decreased by several anti-mania agents, including lithium carbonate, valproic acid, and carbamazepine (Malatynska and Knapp, 2005). Furthermore, the effect of these drugs on dominance behavior occurs over a two to four week period of daily administration, a time frame similar to that required for their anti-mania effects. These findings thus suggest that the dominance behavioral system may be a helpful construct for understanding mania.

In the human literature, several theorists have noted the strong phenomenological parallels between mania and dominant behavior (Gardner, 1982; Wilson and Price, 2006). Theorists have noted that during mania people with bipolar disorder tend to display dominance- and status-focused social behaviors (Gardner, 1982; Janowsky et al., 1970). In contrast, when depressed, people with bipolar disorder focus on feelings of inadequacy, and are perceived by themselves and others as subordinate and submissive (Gilbert et al., 2007). Gilbert and colleagues have theorized explicitly that bipolar disorder, with its cycles of mania and depression, may reflect a dysregulation in the dominance behavioral system (Gilbert et al., 2009, 2007).

Despite theory and animal research, only a little empirical research is available on the links between dominance and mania among humans. In one study, Gilbert et al. (2007) examined self-ratings of power by asking people diagnosed with bipolar disorder and healthy controls to complete 11 items rating their superiority and attractiveness. Even mild positive moods were related to above-average ratings of social rank within the bipolar sample. There is also evidence from one study that perceptions of power are elevated even among those only at risk for the disorder. In this study (Taylor and Mansell, 2008) participants worked in pairs to build a house from Legos. Higher scores on the Hypomanic Personality Scale (HPS), a measure of risk for mania, were correlated with high self and peer ratings of being dominating during the task.

Other results are consistent with the idea that mania may be related to elevated dominance motivation. For example, some people adopt life ambitions towards extrinsic goals that

instill social rank and admiration from other people, such as fame and wealth, rather than intrinsically satisfying goals, such as love and close connection to others. Such extrinsic goals have been perceived as one sign of a motivation to achieve dominance (Duriez et al., 2007). Heightened ambitions for fame, wealth, and political influence have been related both to risk for mania (Carver and Johnson, 2009; Fulford et al., 2008; Gruber and Johnson, 2009; Johnson and Carver, 2006; Johnson and Jones, 2009) and to lifetime diagnoses of mania (Johnson et al., 2009). Heightened ambitions for extrinsic recognition have also been found to predict both the onset of bipolar disorder (Alloy et al., 2011) and a more severe course of mania (Johnson et al., in press). Across these studies, bipolar disorder did not relate strongly to ambitions in other domains of life, such as connectedness and well-being. The pattern found in these studies is consistent with the idea that mania proneness is related to seeking of dominance.

The goal of the studies reported here was to examine more explicitly how manic propensities relate to a profile of qualities related to the dominance behavior system. Across four studies, we examined dominance motivation and perceptions of power. We also examined two other variables related to power: pride, an emotion that has been conceptualized as an outcome of having attained power, and behavioral expressions of power. We hypothesized that manic tendencies would be positively related to motivation for social dominance, self-ratings of power, tendencies toward power-oriented pride, and social behaviors reflective of self-perceived power.

Our focus here is on manic temperament rather than clinical diagnoses of mania. A large body of research has suggested that one of the best predictors of onset of bipolar disorder is trait-like tendencies toward manic symptoms and high mood states (Lara et al., 2006; Oedegaard et al., 2009). Such a temperament has been found to be a more common expression of manic propensities than are clinically diagnosable disorders, and yet to share biological and genetic overlap with the clinical forms of disorder (Akiskal and Akiskal, 2005). It has been argued that the continuing presence of this temperament across evolution suggests that these traits may have important evolutionary advantages in certain contexts. Indeed, it has been suggested that the manic temperament may have particular advantages for achieving dominance and leadership (Akiskal and Akiskal, 1992). In the research reported here, then, we used the Hypomanic Personality Scale, which has been well-validated as a screener for bipolar spectrum disorders, as an index of manic temperament.

Although research on clinically diagnosed populations is important, it is also worth noting that episodes of mania can lead to profound disappointments and setbacks in life accomplishments. As such, it can be difficult to determine whether a desire for more power reflects the aftermath or the vulnerability to disorder. In this way, the study of manic temperament actually provides some advantage.

3. Study 1

3.1. Method

All procedures for this study were approved by the Institutional Review Board at the University of Miami. Participants were 454 students (68.7% female, ages 18 and above) at the University of Miami. Each completed written informed consent and the measures described here (along with other measures not relevant to this study) in large group sessions during the first week of the semester (due to occasional missing responses, Ns for particular correlations vary slightly). Although ethnicity was not gathered as part of these studies, the typical composition of the student body at the University of Miami is approximately half non-Hispanic Whites, one quarter Hispanics, with the remainder being relatively evenly

divided among African Americans, Caribbean islanders, Asians, and self-identified “others”. We have no reason to believe our samples differed from this distribution.

3.2. Measures

3.2.1. Mania vulnerability—The Hypomanic Personality Scale (HPS; Eckblad and Chapman, 1986) identifies people at risk for mania (bipolar spectrum disorders). The HPS contains 48 true–false self-report items that capture manic temperament, as defined by frequency of episodic shifts in emotions, behavior, and energy. Examples include: “There have often been times when I had such an excess of energy that I felt little need to sleep at night,” and “I often feel excited and happy for no apparent reason”. In previous research, people who obtained scores at least 2 SDs above the mean had a prevalence of hypomanic episodes that was 9 times greater than lower scorers, and more than 78% of these high scorers met criteria for bipolar spectrum disorders (Kwapil et al., 2000; Eckblad and Chapman, 1986). Eckblad and Chapman (1986) reported that the HPS correlates well with other screening instruments for mania (General Behavior Inventory: $r=.47$, $n=768$) and is uncorrelated with the Crowne–Marlow Social Desirability Scale, $r=.05$, $n=768$. The measure has high reliability (15-week test-retest reliability=.81; $\alpha=.87$). In this study, internal consistency was high, $\alpha=.87$, and the mean score was 19.41 ($SD=8.45$).

3.2.2. High aspirations—The Willingly Approached Set of Statistically Unlikely Pursuits (WASSUP) is a self-report measure designed to assess highly ambitious life goals (Johnson and Carver, 2006). Instructions asked respondents to indicate how likely they were to set each of the 30 outcomes named as a goal for themselves. Response options ranged from “no chance I will set this goal for myself” (1) to “definitely WILL set this goal for myself” (5). The WASSUP has seven factor-analytically derived subscales. In this study, we focus on Popular Fame and Wealth subscales, as these extrinsic goals (cf. Kasser and Ryan, 1996) have the clearest links with a desire for social dominance. In previous studies, ambitions of fame and wealth were found to be more robustly correlated than were other WASSUP scales with HPS scores (Johnson and Carver, 2006; Johnson and Jones, 2009; Gruber and Johnson, 2009) and with diagnoses of mania (Johnson et al., 2009). Across studies, this profile was independent of current symptoms of mania and depression and lifetime depression. Items on both scales are designed to capture extremely ambitious goals. Sample items for Popular Fame include “you will appear regularly on TV,” “you will have a major role in a movie,” and “celebrities will want to be your friends”. Sample items for Financial Success include “you will have 20 million dollars or more” and “you will run a Fortune 500 company”. In this study, the internal consistency of the WASSUP subscales was good, α Popular Fame=.88, α Financial Success=.78. The two WASSUP subscales correlated moderately with each other, $r=.44$, $p < .05$.

3.2.3. Dominance motivation—A commonly used measure of dominance motivation is a subscale from the Personality Research Form (PRF, Jackson, 1984). Dominance is measured by 16 true–false items such as “The ability to be a leader is very important to me,” “I would like to be an executive, with power over others,” and “I feel uneasy when I have to tell people what to do” (reverse-coded). For comparison, we also included two other PRF subscales. Achievement motivation is measured by items such as “I will not be satisfied until I am the best in my field of work,” “I often set goals that are very difficult to reach,” and “I try to work just hard enough to get by” (reverse-coded). Affiliation motivation is measured by items such as “I spend a lot of time visiting friends,” “I try to be in the company of friends as much as possible,” and “I go out of my way to meet people”. Alphas for this sample were .69, .81, and .78, respectively. The PRF Dominance subscale was modestly correlated with Affiliation, $r=.20$, Achievement, $r=.24$, and aspirations for Popular Fame, $r=.22$, and Financial Success, $r=.30$, all $ps < .05$.

3.2.4. Symptom measures—Two additional measures were completed by a subset of 373 participants (69.8% female). These measures assessed current symptoms of mania and depression.

3.2.5. Manic symptoms—Current manic symptoms were assessed using the Self-Rating Mania Index (SRMI, Altman et al., 1997). Items on this scale have been shown to load on a single component in factor analysis, and the scale has strong correlations with self-report and interview measures of mania (Altman et al., 2001). It has also shown good ability to discriminate patients with mania from those with schizophrenia or depression (Altman et al., 1997). Possible scores range from 5 to 25. In this sample, alpha was .76, and the mean score was 9.18 ($SD=3.70$).

3.2.6. Depression symptoms—Current symptoms of depression were assessed using the Short Form of the Beck Depression Inventory (BDI, Beck and Beck, 1972). The short-form BDI consists of 13 self-report items concerning affective, cognitive, and somatic symptoms of depression. The scale has adequate internal consistency, high correlations with other measures of depression, and high correlations with risk variables for depression (Gould, 1982; Knight, 1984; Scogin et al., 1984). In this sample, alpha was .80, and the mean score was 2.90 ($SD=3.27$).

4. Results

Because of the large sample size, alpha was set to .01. Correlations of hypomanic tendencies with motive dispositions and ambition scales are displayed in Table 1. Consistent with hypothesis, HPS related moderately strongly to dominance motivation (PRF). This finding did not appear to be explained by a general tendency to endorse all motivations, in that the correlation of the HPS with the affiliation motive and the achievement motive were significantly smaller than the correlation with dominance motivation, $t=2.87$, $p < .005$, and $t=4.04$, $p < .005$, respectively. As in previous studies, HPS related substantially to ambitions for Popular Fame and Financial Success. Tests for gender interactions revealed that this profile was consistent across genders. The only exception was that although the HPS related to ambition for Popular Fame among both genders, the association was significantly stronger among females, $r(310)=.57$, $p < .001$, than among males, $r(140)=.35$, $p < .001$; $z=2.76$, $p < .01$.

We also examined whether current mood states were a potential confounder of these effects. Because only a subset of participants completed the measures of current symptoms, N s are lower for these analyses. HPS scores related significantly both to current BDI scores, $r(371)=.17$, $p < .002$, and to current SRMI scores, $r(371)=.26$, $p < .001$. Partial correlations of HPS with dominance variables, controlling for current symptom severity levels, displayed in Table 1, formed much the same pattern as did the simple correlations. As can be seen from a comparison of columns, the links of manic risk with motive dispositions and elevated ambitions did not depend on current symptoms.

5. Discussion

Study 1 provides the first direct test of whether manic tendencies are related to heightened motives for social dominance. Congruent with suggestive findings from animal research, the findings support this hypothesis. The pattern was not explained by current symptoms or by a tendency to endorse motive qualities more generally. The findings also replicated previous findings that manic tendencies are related to heightened extrinsic ambitions.

Study 1 focused on dominance motivation. Another key dimension of the dominance behavioral system is the perception of whether one has already attained power. In considering power, it is important to note that several lines of work suggest that there are several paths to the attainment of power. Although ethological studies of the dominance behavioral system often emphasize aggression as a means of obtaining power (Dunbar, 1988), Gilbert has argued that, among humans, power often accrues to those who offer highly valued resources to a group, such as intelligence and beauty. Related to this, Henrich and Gil-White (2001) have argued that it is important to differentiate the strategies used to gain power, as some persons may gain social influence through prosocial, admirable activities (prestige). Accordingly, in Study 2, we examined links of the HPS with self-perceptions of prestige as well as self-perceptions of dominance-based status.

6. Study 2

6.1. Method

All procedures for this study were approved by the Institutional Review Board at the University of Miami. Participants were 780 students (60% female) at the University of Miami. As in Study 1, each completed written informed consent and the measures described here (with other measures not relevant to this study) in large group sessions during the first week of the semester (again, due to occasional missing responses, *N*s for particular correlations vary slightly).

6.1.1. Measures—Manic tendencies again were assessed by the HPS (in this sample, $\alpha=.85$, $M=19.19$, $SD=7.96$). Elevated ambitions again were assessed by the WASSUP (α for Popular Fame=.87, Financial Success=.74). Current depression symptoms again were assessed by the BDI ($\alpha=.86$, $M=3.24$, $SD=4.04$). Current manic symptoms again were assessed by the SRMI ($\alpha=.79$, $M=9.62$, $SD=3.86$).

6.1.2. Self-perceptions of power—Participants completed a slightly modified version of the Self-perceived Social Status Scale (SSSS), developed by Buttermore et al. (2005) to assess perceptions related to social status. The SSSS has three sets of items, two of which are discussed here. One set assesses the self-perception of social dominance (e.g., “I often try to get my own way regardless of what others want,” “I enjoy having control over others”); the second set assesses the self-perception of prestige (e.g., “I am held in high esteem by those I know,” “People value my opinions”); a third set (not discussed here) assesses self-perceptions of the tendency to be submissive (e.g., “I defer to others when decisions have to be made”). Previous research has supported the discriminant validity of these subscales, in that dominance but not prestige is correlated with hostility and aggression (Johnson et al., 2007), whereas prestige but not dominance is correlated with social acceptance (Cheng et al., 2010). Response options in this sample ranged from “I strongly disagree” (1) to “I strongly agree” (5) rather than the 7-point scale used by Buttermore et al. (2005). Alphas were .81 for prestige and .82 for dominance.

6.2. Results

Because of the large sample size, alpha was set to .01. Correlations among the dominance-relevant scales are in Table 2. It is of some interest that the Prestige scale correlated more strongly with the ambition for Popular Fame than with the ambition for Financial Success, whereas the opposite was true for the Dominance scale. This pattern would appear to constitute further evidence of the validity of those scales.

Our primary interest here, however, was on the correlations of HPS scores with these various measures. As can be seen in Table 2, HPS scores were related to self-perceptions of

both prestige and dominance, and at nearly identical levels. This was true despite the fact that dominance self-perceptions were not very strongly related to prestige self-perceptions. As in previous studies, the HPS related substantially to the aspirations for popular fame. The HPS related moderately to aspirations for financial success.

To be certain that the associations of HPS with other variables did not depend on symptoms, correlations were repeated controlling for symptoms (HPS scores related weakly to current BDI scores, $r=.08$, $p < .03$, and more substantially to current SRMI scores, $r=.29$, $p < .0001$). These partial correlations formed much the same pattern as did the simple correlations, as was the case in Study 1.

6.3. Discussion

Study 2 replicated and extended the findings of Study 1. As in Study 1, mania tendencies were related to elevation in extrinsically-oriented life ambitions. Extending the results of Study 1, Study 2 found that manic tendencies related to self-perceptions of having attained both dominance and prestige. The relationships with these two classes of self-perceptions of power (which were not strongly related to one another) were nearly identical, suggesting that the classes of self-perceived power are not particularly differentiated here. Rather, manic temperament appears related to a broader sense of having attained power in whatever way it occurs.

7. Study 3

Study 3 explored another manifestation of dominance: pride. Pride is an emotion triggered by the perception that one is doing well in meeting social standards that would garner the respect and attention of others (Tracy and Robins, 2007a). As such, pride is an outcome of perceiving that one has achieved power (Weisfeld and Wendorf, 2000).

An important distinction has been made, however, between authentic and hubristic pride (Tracy and Robins, 2007a). Whereas the former is based on specific actions or accomplishments, the latter stems from self-attributions of one's value that may not be founded in such actions or accomplishments. It has been suggested that hubristic pride reflects a strategy of procuring resources while de-emphasizing interpersonal connectedness (Tracy et al., 2009). Consistent with that view, hubristic pride has been found to be related to ambitions for extrinsic goals as measured by the WASSUP (Carver et al., 2010). Thus, it seems plausible that hubristic pride should be related to dominance motivation (Tracy and Robins, 2004, 2007a). Previous research found that tendencies toward mania are related to elevations in pride (Gruber and Johnson, 2009) but that study did not differentiate the two forms of pride. Study 3 investigated whether manic temperament related specifically to Hubristic Pride as opposed to Authentic Pride.

7.1. Method

All procedures for this study were approved by the Institutional Review Board at the University of Miami. Participants were students (57% female) at the University of Miami. As in Studies 1 and 2, each completed written informed consent and the measures described here (with other measures not relevant to this study) in large group sessions. Due to missing questionnaires in the bundles in certain group sessions, *N*s for particular correlations vary from 104 to 148.

Manic tendencies again were assessed by the HPS (in this sample, $\alpha=.85$, $M=18.43$, $SD=7.59$). Dominance motivation was measured with the PRF ($\alpha=.81$, $M=9.83$, $SD=5.90$). To provide a comparison with another motivational tendency, the PRF Affiliation Motivation scale was also included ($\alpha=.87$, $M=10.56$, $SD=5.24$). The two PRF motive

scales were highly correlated, $r=.43$, $p < .001$. Elevated ambitions related to extrinsic recognition were assessed by the relevant WASSUP subscales (Popular Fame $\alpha=.87$, $M=1.88$, $SD=.86$, Financial Success $\alpha=.81$, $M=2.71$, $SD=1.16$).

7.2. Pride

The Authentic and Hubristic Pride scales (Tracy and Robins, 2007b) were developed based on evidence for the separability of authentic and hubristic pride. For each item, participants are asked to describe the extent to which a particular adjective or phrase represents them, using a five-point scale. Authentic pride is the tendency to experience pride as a function of specific qualities or accomplishments (e.g., “like I am achieving,” “fulfilled,” “productive”). Hubristic pride is the tendency to experience pride as a function of more global self-evaluations (“arrogant,” “conceited,” “pompous,” “smug”). The scales have achieved factor analytic support and have been shown to differentially relate to a broad range of measures of functioning and personality (Tracy and Robins, 2007b). Both scales had high internal consistency, alphas=.89 for authentic and .85 for hubristic. As with previous samples, scores for Authentic Pride, $M=3.42$, $SD=.79$, were higher than those for Hubristic Pride, $M=1.51$, $SD=.50$, $t(149)=25.91$, $p < .001$. The two scales were unrelated, $r(150)=.08$.

7.3. Results and discussion

Because of the large sample size, alpha was set to .01. As shown in Table 3, manic tendencies (HPS) were significantly related to the PRF Dominance Motivation scale. This was not part of a general tendency to endorse heightened motivations, in that HPS scores were not correlated with the PRF Affiliation Motivation scale. The correlation of the HPS with PRF Dominance Motivation was significantly larger than the correlation of the HPS with PRF Affiliation Motivation, $t=5.07$, $p < .01$. The HPS was also significantly related to WASSUP subscales reflecting ambitions for Financial Success and Popular Fame. Manic vulnerability was related to self-rated Hubristic Pride, but not Authentic Pride.¹

Findings of Study 3 thus replicate those of Study 2 in finding that mania-prone individuals endorse heightened desires for dominance and lifetime ambitions for extrinsic recognition. In this study, though, we were able to verify that these endorsements were not an effect of negative experiences associated with the disorder, because effects emerged among those with high HPS scores who did not meet diagnostic criteria for bipolar disorder. The findings also extend previous research on pride as a correlate of manic tendencies (Gruber and Johnson, 2009), by relating mania proneness more specifically to hubristic pride—based on global evaluations of one’s self—rather than authentic pride. It is worth noting that hubristic pride has been related to a range of negative outcomes in previous research, including tendencies toward aggression, anger, and impulsivity (Carver et al., 2010; Tracy et al., 2009). Hence this finding points towards the potential dark side of a focus on attaining dominance, at the potential cost of interpersonal relationships.

8. Study 4

In an extensive review, Keltner et al. (2003) described the many ways in which self-perceptions of power can shape social behaviors. Obvious behaviors are directiveness and leadership. Self-perceptions of power have also been related, however, to greater levels of engagement and sociability, as well as frankly negative behaviors such as aggression and impulsivity.

¹To verify that these associations did not depend on the presence of persons who were diagnosable, 15 persons with high HPS scores (>32) completed the Structured Diagnostic Interview for DSM-IV (First et al., 1995). One who met diagnostic criteria for bipolar I disorder and two who met criteria for bipolar II disorder were excluded from the analyses reported here. Results did not differ materially from results including those persons.

To the extent that manic temperament relates to heightened self-perceptions of power, one would expect this to be expressed in a range of such socially dominant behaviors. In Study 4, we examined self-rated socially dominant behavior as a correlate of the HPS. In developing a measure of socially dominant behavior for this study, items were written to incorporate various manifestations of power, including assuming leadership roles, taking initiative, attempting to persuade others, and giving advice. Items were written to reflect behaviors that might be perceived positively as well as those that might be perceived negatively.

8.1. Method

All procedures for this study were approved by the Committee for the Protection of Human Subjects at the University of California, Berkeley. Participants were students at the University of California, Berkeley. Each completed written informed consent and the self-report measures below online (along with other measures not relevant to this study) to receive partial credit toward a course requirement. The mean age of the sample was 20.5 (range 18–39). Of those who completed questions regarding ethnicity, 1.5% identified as African American, 2.8% as multiracial, 47% as Asian or Asian-American, 1.3% as Pacific Islanders, and 24.9% as Caucasian. Regarding ethnicity, 8.2% described themselves as Latino. To verify that participants were responding carefully, five “catch” items were inserted into the battery, in which participants were asked to answer a question with a specific response (e.g., “Choose ‘4’ as your response for this item”). Forty-two participants were excluded from analyses for failing to answer these catch items correctly. All remaining participants took more than 20 min to complete the questionnaires and had low levels of missing responses. The final sample consisted of 514 participants (56.2% female).

8.1.1. Measures—Manic tendencies again were assessed by the HPS (in this sample, $\alpha=.91$, $M=20.31$, $SD=5.94$).

8.1.2. Socially dominant behavior scale (SDBS)—We wrote 12 items to assess socially dominant behaviors based on the existing social dominance theory. Each item describes a social situation in which a person behaves in a dominating or intrusive manner, and respondents rated the extent to which they engaged in that behavior over the past two weeks on a scale of 1 (never) to 5 (always).

8.2. Results and discussion

Preliminary analyses considered the psychometric characteristics of the SDBS. Although the initial item set included two items about “telling off” others, few people endorsed them. As a result, these two items did not achieve normalcy (kurtosis estimates for both were above 3.5, $SE=.21$). Given the low rates of endorsement, these items were excluded. The remaining items were factor analyzed (using oblimin rotation to permit correlations among factors). A one-factor solution emerged, with the 10 items loading on a single factor with an Eigenvalue of 4.05, which exceeded threshold for Horn’s Parallel Analysis (see Table 4 for items).

Because of the large sample size, alpha was set to .01. To test the hypothesis, we correlated the Socially Dominant Behavior Scale with HPS scores, obtaining a substantial positive correlation, $r(512)=.48$, $p < .001$.

This study, of course, has limitations. It did not include current mood state ratings, so we cannot comment on whether dominant behaviors are tied to symptoms. The SDBS relies entirely on self-ratings of behavior, which may be biased. Nonetheless, in previous research, peers also rated those prone to mania as appearing to be highly dominant (Taylor and Mansell, 2008). Current findings extend that work by considering specific behaviors.

9. General discussion

The work reported here builds on previous theory (Gilbert et al., 2007; Wilson and Price, 2006) and animal research (Malatynska and Knapp, 2005) to examine how risk for mania relates to multiple manifestations of the dominance behavioral system. At the broadest level, findings indicate that manic temperament, assessed using a self-report measure of frequent occurrence of mild manic symptoms, related to many different manifestations of dominance motivation and self-rated power, as well as conceptually related emotional and behavioral tendencies.

More specifically, persons at risk for mania endorsed heightened motivation for power; they also reported self-perceptions of power which generalized across two aspects of power (dominance and prestige). Consistent with the heightened motivation to attain power, findings from three samples indicate that persons who endorsed manic tendencies reported setting highly ambitious life goals relevant to earning extrinsic recognition. Manic tendencies also related to elevations in self-ratings of hubristic pride, a type of pride that is based on power-related global attributions about the self. Manic tendencies also related to self-ratings of dominating social behavior. Findings of Studies 1 and 2 confirmed that dominance motivation and self-rated power were not secondary to current symptoms. Findings of Study 3 confirmed that dominance related behavior does not depend on the inclusion of persons who meet diagnostic criteria for mania.

Some limitations must also be acknowledged. First, information about current symptoms and diagnostic status was available for only a subset of samples. A second limitation was the use of students who endorsed subsyndromal manic symptoms; it is unclear whether results will generalize to individuals diagnosed with bipolar disorder. It will be important to replicate findings using a clinical sample, as the repeated losses that often accompany this disorder could further shape dominance motivation and perceptions of power.

A third limitation is the reliance on self-report measures of the dominance behavioral system. An increasing body of research has demonstrated that basal testosterone levels can predict many manifestations of dominance motivation, such as sensitivity to rank challenges (Archer, 2006). DHEA, a precursor to testosterone, has been described as triggering mania in a series of case reports (Kline and Jagers, 1999; Markowitz et al., 1999). It would seem fruitful to include hormone assays in future studies of bipolar disorder. Similarly, paradigms that involve observing social behavior in interpersonal interactions are a useful way to study these issues (Taylor and Mansell, 2008).

Notwithstanding the limitations, findings from this study converge with a range of other evidence that implicates the dominance behavioral system as an important facet of risk for mania, in that others have found that manic tendencies were related to tendencies toward overly positive social comparison (Gilbert et al., 2007), highly dominating behavior (Taylor and Mansell, 2008), unrealistically high ambitions for extrinsic recognition (Carver and Johnson, 2009; Johnson et al., 2009) and trait-like elevations in pride (Gruber and Johnson, 2009). At a broader level, the disruptions of the dominance behavioral system observed here are consistent with animal models of bipolar disorder that emphasize heightened dominance behavior (Malatynska and Knapp, 2005).

Keltner et al. (2003) have argued that perceptions of power lead to increases in approach motivation. Others have conceptualized power as one of a host of potential rewards, and have suggested that those with high approach motivation in general will also tend to have high dominance motivation (Depue and Morrone-Strupinsky, 2005). Our findings that persons at risk for bipolar disorder desire dominance and view themselves as powerful, then, fit with previous research suggesting that bipolar disorder and risk for bipolar disorder are

related to heightened approach motivation (Johnson et al., 2012a; Meyer et al., 2001). The findings go beyond those of previous research in focusing explicitly on aspects of approach related to social dominance.

Perceptions of power may represent an initial step in promoting action tendencies, but the resultant actions can contribute to attaining either adaptive or maladaptive goals. The divergence among the behavioral correlates of dominance is intriguing, because bipolar disorder is related both to remarkable prosocial accomplishments (Jamison, 1993) and also to tragic problems with social and occupational roles. A key goal, then, is to understand the social contexts and psychological variables that guide dominance motives towards adaptive or maladaptive outcomes. At a broad level, these findings fit with the theory that manic temperament is evolutionarily adaptive in certain contexts (Akiskal and Akiskal, 1992).

In sum, the current findings indicate a profile of heightened dominance motives, self-perceptions of elevated rank, ambitious goal-setting, and dominant behavior related to manic temperament. More research is needed, though, to understand how well these findings generalize to clinically diagnosed bipolar samples, and to study the implications of heightened dominance motivation and rank perceptions for the course of bipolar disorder and for social functioning.

Acknowledgments

The authors thank Lori Eisner, Daniel Fulford, Jutta Joormann, Nicole Marquinez, Christopher Miller, and Eliot Tang for their help in gathering data.

Role of funding source

Support for the preparation of this manuscript was provided by NIMH Grant MH 076021 to the first author.

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Table 1

Correlations and partial correlation of hypomanic temperament (HPS) with motive dispositions and elevated ambitions, Study 1.

	HPS ($n=454$)	HPS Controlling for manic and depressive symptoms ($n=373$)
PRF dominance	.36*	.38*
PRF achievement	.14*	.15
PRF affiliation	.20*	.20*
Popular fame	.42*	.40*
Financial success	.29*	.27*

*
 $p < .01$.

Table 2Correlations among dominance and prestige scales and extrinsic ambitions, Study 2 ($N=780$).

	Dominance	Popular fame	Financial success	HPS
Prestige	.19	.23	.15	.33
Dominance		.19	.31	.35
Popular fame			.48	.38
Financial success				.22

All correlations are significant at $p < .001$.

Table 3

Correlations of hypomanic temperament (HPS) with ambitions, power, and pride, Study 3.

	HPS
PRF dominance	.33*
PRF affiliation	.02
WASSUP popular fame	.37*
WASSUP financial success	.29*
Authentic pride	.02
Hubristic pride	.31*

Note: $N=148$ for PRF and WASSUP analyses, and 104 for Authentic and Hubristic Pride.

* $p < .01$.

Table 4

Items on the Socially Dominant Behavior Scale.

10 items, alpha=.85

I've been the natural leader in groups because I know my leadership skills are superior.

I've been insisting that my friends join me in the activities I want to do.

I've been striking up conversations with strangers.

I've been asking people I have just met to join me in a social activity.

I've been giving advice to strangers.

I've been giving people advice even when they don't ask for it.

I've stood up for people that I think have been treated poorly in public places.

When I've had a problem at a business or other organization, I prefer to "go to the top."

When others have not shared my opinion, I've tried to change their minds.

Sometimes I've just had to "set people straight."
