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## Research report

## Nonverbal dominance behavior among individuals at risk for mania



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## ABSTRACT

**Background:** Research suggests that people with bipolar disorder may be highly motivated to attain dominance and may over-estimate their social power (Johnson and Carver, 2012). This manic temperament may provide an adaptive advantage in the pursuit of dominance and leadership (Akiskal and Akiskal, 1992). It was hypothesized that people at high risk for bipolar disorder, as defined by the Hypomanic Personality Scale (HPS), would fail to assume a submissive role when it was appropriate to do so.

**Method:** Participants (81 undergraduates) completed an image description task with a confederate. Participants were randomly assigned to interact with a confederate who assumed one of three nonverbal postures: dominant (expanded), neutral, or submissive (constricted). Nonverbal dominance behavior was defined as the rate at which participants expanded their body span during the task.

**Results:** Consistent with hypotheses, an ANOVA indicated an interaction of Mania risk x Dominance condition on body expansion. Whereas participants with low mania risk (HPS scores) adapted complementary behavior in response to the confederate, participants with high mania risk demonstrated a consistently dominant (expanded) nonverbal posture.

**Limitations:** A major limitation of this study is the use of an analog measure of mania risk in place of clinical diagnoses.

**Conclusions:** In this experiment, participants at high risk for mania maintained a dominant posture even when submissiveness would have been more appropriate. It is argued that persistent dominance behavior may play an important role in the interpersonal interactions of individuals at risk for bipolar disorder.

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## 1. Introduction

Bipolar disorder is considered one of the most disabling neuro psychiatric disorders (World Health Organization (2000)). Individuals with bipolar disorder have higher rates of mortality than the general population, due in part to the considerably high rates of suicidality (Jamison, 2000; Angst et al., 2002; Goodwin et al., 2003). All too often, symptoms and stigma associated with the disorder interfere with maintaining employment and housing (Folsom et al., 2005).

Relationship conflicts and interpersonal losses are all too common in bipolar disorder, and relatively few studies have focused on the sources of interpersonal difficulties. One promising model seems to be that individuals with bipolar disorder have exaggerated dominance tendencies (Gardner, 1982; Wilson and Price, 2006). Indeed, it has been argued that one of the adaptive facets of the

manic temperament may be the advantages for the pursuit of dominance and leadership (Akiskal and Akiskal, 1992).

Humans and other higher primates naturally form and maintain social hierarchies (Chase and Seitz, 2011; Chiao, 2010). There are natural asymmetries among individuals in their ability to prevail in competition and to bring resources to the group, and these asymmetries guide the development of hierarchies. Dominance motivation is defined by the desire to achieve positions at the top of this hierarchy, and thus control over social resources. Individuals who are high in dominance motivation seek power-enhancing roles. Individuals vary considerably in their level of dominance motivation. People and animals gain power through both prosocial and aggressive dominance behavior, as well as by socially valued behaviors and traits. Power refers to successful achievement of a high rank within a hierarchy and has been defined as control of social or material resources (Keltner et al., 2003). Individuals high in power are often focal and influential group members, as well as attractive social partners. High levels of power are associated with increased expression of positive emotion as

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well as disinhibited and sometimes inappropriate social behaviors (Keltner et al., 2003).

In animals, the pursuit of dominance is often measured as physical displays of size and aggression. Congruently, high levels of dominance also predict self-reported aggression in humans (Johnson et al., 2007). Beyond overt aggression, animals and humans also tend to display their dominance in subtle ways. Many humans seek power through prosocial formation of alliances and by offering highly valued resources to group members (McClelland, 1970; Winter and Stewart, 1978).

In both animals and humans, evolution supports highly attuned responses to dominance displays. Battles for dominance often lead to conflict, and the effective resolution of this conflict occurs when one organism expresses submissive behavior (Drews, 1993). In humans, the expression of appropriately submissive behavior often occurs innately and automatically before conflict can even occur. Much of this occurs through unconscious nonverbal behaviors such as posture changes and gestures (Tiedens and Fragale, 2003). These innate behaviors are a valuable part of task-oriented social interactions.

Individuals normatively engage in complementary responses to dominance-relevant cues; that is, dominant nonverbal behaviors of one individual are met with the submissive behaviors of the other and vice versa. Complementarity in dominance behaviors has been related to higher relationship satisfaction among romantic partners (Dryer and Horowitz, 1997). Complementarity appears most likely to occur in task-related interpersonal activities, and when it occurs, it ensures social harmony during goal-directed joint tasks (Tiedens and Fragale, 2003). In a recent study, Tiedens and Fragale (2003) posited that goal-directed tasks flow more smoothly and comfortably when one person assumes a leadership role and a more submissive partner follows them towards a solution. In their study, participants were paired with a confederate who adopted either dominant (physically expanded) or submissive (physically constricted) nonverbal postures during a task-oriented interaction. Most of the participants automatically assumed a body posture complementary to that of the confederate. In the second part of the study, participants were instructed to hold certain postures and thus forced to mirror the dominant or submissive posture of the confederate. When assumption of complementary roles was prevented in this manner, participants reported less liking of the confederate and less comfort in the interaction. Negative outcomes were more predicted by failures of complementarity than by whether the participant had assumed a submissive or dominant posture.

Findings indicate that failure to respond to nonverbal dominance and submissiveness displays in a complementary manner during joint problem solving tasks can result in social discomfort, and even dislike of the person who fails to show this fluidity. The goal of the current study was to examine whether people at high risk for mania show a lack of fluidity in adopting a submissive posture in response to another's dominance displays.

### 1.1. Dominance and mania

A relationship between dominance and behaviors resembling mania has been observed in several animal research paradigms. For example, among Sabra mice bred to increase dominant behavior, mood-stabilizing medications commonly prescribed to treat mania were found to reduce dominance behaviors. In parallel, among mice bred for submissive behavior, antidepressant medication normalized overly submissive behavior (Feder et al., 2010). Rats with high levels of dominance behavior also display a range of "manic type" symptoms, such as increased pursuit of rewards (food), aggression, and hyperactivity (Malatynska and Knapp, 2005).

In humans, it has been argued that manic temperament may involve heightened dominance behavior (Akiskal and Akiskal, 1992). Mania is characterized by a marked increase in goal oriented behavior, grandiose self-perceptions, and heightened sexual and social activity (American Psychiatric Association, 2000). These behaviors overlap substantively with behaviors associated with power (Gardner, 1982; Wilson and Price, 2006).

Testosterone has been consistently shown to be correlated with dominance motivation, power, and dominance-relevant behavior using a broad array of paradigms (Archer, 2006; Archer and Webb, 2006; Sellers et al., 2007; Schultheiss et al., 1999; Mazur and Booth, 1998). Several randomized control trials (Pope et al., 2000; Yates et al., 1999; Su et al., 1993) and small observational studies (Pope and Katz, 1988; Malone et al., 1995) support links between testosterone administration and mania among men. As an example, among 39 male and 2 female body builders who were taking anabolic steroids to increase muscle mass (Pope and Katz, 1988), 12.2% became manic and 19.5% developed subthreshold manic symptoms. Findings of one randomized controlled trial support the idea that supraphysiological doses of testosterone are linked with increases in manic symptoms among men (Pope et al., 2000). In sum, this evidence also strongly indicates a relationship between testosterone, which appears to be a core biological correlate of the dominance behavioral system, and mania.

In more direct empirical tests, people with elevated risk for mania tend to have grander self-perceptions of dominance and prestige as well as higher levels of hubristic pride than normal controls (Johnson and Carver, 2012). They have also been hypothesized to place more value than most individuals do on achieving higher positions within the social hierarchy (Gilbert et al., 2007). Dominance motivation has been found to correlate with ambitions for popular fame and financial success (Johnson and Carver, 2012), and in turn, heightened ambitions for popular fame and financial success are elevated among those at risk for (Carver and Johnson, 2009; Fulford et al., 2008; Gruber and Johnson, 2009; Johnson and Carver, 2006; Johnson and Jones, 2009) and diagnosed with bipolar disorder (Johnson et al., 2009). These elevated ambitions are predictive of increases in manic symptoms among bipolar individuals (Johnson et al., 2012) as well as the onset of bipolar disorder (Alloy et al., 2012). There is also evidence that this profile may become more intense during high mood states, in that elevated mood in bipolar individuals has been associated with increased feelings of superiority (Gilbert et al., 2007).

In sum, theory suggests that bipolar individuals value power and engage in a number of behaviors associated with attainment of power. There are strong biological connections between testosterone levels and mania among men. However, little is known about how dominance behavior is manifested among persons at high risk for mania. In one study, a measure of mania risk was found to correlate with self-ratings of engaging in dominant behaviors (Johnson and Carver, 2012). In a laboratory study of a goal-oriented interaction, participants at high risk for mania described their behavior as more "dominating" than did those at low risk (Taylor and Mansell, 2008). We are unable to identify other published studies of how mania risk relates to dominance behavior.

The aim of this study was to examine how manic tendencies relate to the expression of nonverbal dominance behaviors. Using a previously validated paradigm (Tiedens and Fragale, 2003), participants at high and low risk for mania, as defined by the Hypomanic Personality Scale (HPS), interacted in a goal-oriented image description task with a trained confederate who assumed either a submissive (constricted), neutral, or dominant (expanded) body posture during the interaction. It was hypothesized that people at high risk for mania would be less willing to relinquish the dominant position when a confederate assumed a dominant posture as compared to those at low risk.

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