Valuing happiness is associated with bipolar disorder

Brett Q. Ford

University of California, Berkeley

Iris B. Mauss

University of California, Berkeley

June Gruber

University of Colorado Boulder

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**Corresponding Author:*

June Gruber
Department of Psychology and Neuroscience
University of Colorado Boulder
Muenzinger D244
345 UCB
Boulder, CO 80309-0345
june.gruber@colorado.edu
WORD COUNT: 8,886

Abstract

While people who experience happiness tend to have better psychological health, people who value happiness to an extreme tend to have worse psychological health, including more depression. We propose that the extreme valuing of happiness may be a general risk factor for mood disturbances, both depressive and manic. To test this hypothesis, we examined the relationship between the extreme valuing of happiness and risk for, diagnosis of, and illness course for Bipolar Disorder (BD). Supporting our hypothesis, the extreme valuing of happiness was associated with a measure of increased risk for developing BD (Studies 1-2), increased likelihood of past diagnosis of BD (Studies 2-3), and worse prospective illness course in BD (Study 3), even when controlling for current mood symptoms (Studies 1-3). These findings indicate that the extreme valuing of happiness is associated with and even predicts BD. Taken together with previous evidence, these findings suggest that the extreme valuing of happiness is a general risk factor for mood disturbances. More broadly, what emotions people strive to feel may play a critical role in psychological health.

Keywords: emotion, happiness, valuing, Bipolar disorder

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Happiness not only feels good, but it also promotes health and adaptive functioning (Barrett & Russell, 1999; Fredrickson, 2001; Lyubomirsky, King & Diener, 2005; Veenhoven, 2008). Based on these associations, it is clear why happiness is such a common and highly valued goal (Barrett, 1996; Rusting & Larsen, 1995; Tamir & Ford, 2012a). However, a growing body of research suggests that people who value happiness to an extreme degree can be less likely to attain happiness (Mauss, Tamir, Anderson, & Savino, 2011; Mauss et al., 2012; Tamir & Ford, 2012a), and more likely to experience negative psychological health outcomes (e.g., Ford & Mauss, 2014; Ford, Shallcross, Mauss, Floerke, & Gruber, in press; Gruber, Tamir, & Mauss, 2011), including depression (e.g., Ford, Shallcross, Mauss, Floerke, & Gruber, in press; Mauss et al., 2011). How pervasive are the effects of valuing happiness to an extreme? We propose that valuing happiness to an extreme degree promotes disordered emotion regulation and should thus be a general risk factor for mood disturbances. To test this idea, we examined whether the extreme valuing of happiness is linked with risk for, diagnosis of, and prospective illness course for Bipolar Disorder – a mood disorder that is in some ways the opposite of depression – even when controlling for depression.

Extreme Valuing of Happiness

Recent theory (Gross, 2014; Mauss & Tamir, 2013) and research (e.g., Tamir, 2009) have begun to examine the emotions people want to feel – or, people's emotional values (e.g., to what extent do people want to feel happy?). Prior work has established that emotional values shape the emotions people actually try to feel such that people attempt to up-regulate emotions that they value more highly (e.g., Tamir & Ford, 2009; 2012b; Tsai, Miao, Seppala, Fung, & Yeung,

2007). However, valuing an emotion does not *necessarily* predict the increased experience of the emotion. Rather, mounting evidence suggests that when people want to feel certain emotions too frequently (Tamir & Ford, 2012a), or to too intense a degree (Mauss et al., 2011; 2012), these emotional values can be unsuccessful and may even have undesirable consequences.

Why might emotional values have undesirable consequences? Emotional values are an important predictor of whether someone is motivated to engage in emotion regulation (to reach desired emotional end states). In this conceptualization, emotional values are an important – and perhaps even necessary – precursor to emotion regulation because they provide the desired end-state that motivates emotion regulation (Gross, 1999). Essentially, then, disordered emotional values are thought to lead to disordered emotion regulation, which in turn leads to disordered mood. The pivotal first question is then whether disordered emotional values are linked with disordered mood. Prior research suggests that this may be the case.

Much of the prior research on disordered emotional values has focused on the extreme valuing of happiness – an interesting case because happiness is an exceptionally common emotional value (Barrett, 1996; Rusting & Larsen, 1995; Tamir & Ford, 2012a). Experimental studies have found that participants induced to value happiness more intensely reported worse emotional outcomes compared to participants not instructed to pursue happiness (Mauss et al., 2011; Schooler, Ariely, & Loewenstein, 2003). Extending this research into the domain of disordered mood, the extreme valuing of happiness has also been linked to higher levels of depressive symptoms in undergraduates (Ford et al., in press), stressed community members (Mauss et al., 2011), and even people with a history of major depressive disorder (Ford et al., in press). The extreme valuing of happiness has also found to be higher in people with a history of major depressive disorder, compared to healthy controls (Ford et al., in press). This research

suggests that the extreme valuing of happiness may lead to lesser experience of happiness, and even increase the experience of and risk for depression.

The Extreme Valuing of Happiness and Mood Disorders

Theorizing suggests that the extreme valuing of happiness may be linked with mood disorders, and some initial evidence supports this idea. However, this research has focused almost exclusively on depression (Mauss et al., 2011; Ford et al., in press). To assess whether the extreme valuing of happiness is linked with mood disorders more generally, it is critical to assess other mood disorders. Assessing Bipolar Disorder (BD), in particular, affords two insights. First, BD differs from depression in important ways – namely, that it includes "highs" of mood, and not only "lows" – that would allow us to test whether the extreme valuing of happiness is associated with mood disorders broadly speaking rather than just depression. Second, BD shares a key feature with depression – namely, disordered emotion regulation (Gruber, 2011; Johnson, Gruber, & Eisner, 2007; Kring & Werner, 2004). This shared feature allows us to begin to understand whether the extreme valuing of happiness is linked with disorders characterized by disordered emotion regulation.

Based on prior theory and research, we hypothesize that an extreme desire to attain and maximize happiness (extreme valuing of happiness) may be a key precursor of both depression and BD. However, the emotional values people hold have received little empirical attention in general (Tamir & Mauss, 2011), and even less attention in mood disorders such as BD. Thus, in this investigation, we assess the links between the extreme valuing of happiness and BD. Specifically, we examined links between the extreme valuing of happiness and risk for, diagnosis of, and illness course for BD across an undergraduate sample (Study 1), a community sample (Study 2), and a patient sample (Study 3).

The Current Investigation

The current investigation examined whether valuing happiness to an extreme is more likely to be present in individuals at risk for and diagnosed with BD. While much of the research on mania and bipolar disorder has examined positive emotion more broadly construed, the present investigation takes a more specific focus on one aspect of the positive emotional experience (i.e., happiness).

Study 1 examined whether the extreme valuing of happiness was associated with increased risk for BD within a large young adult undergraduate sample, even when controlling for current symptoms of mania and depression. Examining individual differences in risk for BD in a nonclinical sample is a key step toward establishing whether and how valuing happiness might be linked with BD. Furthermore, controlling for current symptoms helps rule out the possibility that elevated positive emotion (i.e., manic symptoms) or other symptoms of BD (i.e., depressive symptoms) fully account for elevated levels of valuing happiness.

We also assessed different facets of risk for BD to obtain a better understanding of how the extreme valuing of happiness may be linked with BD. Risk for BD is a multidimensional construct and recent evidence (Schalet, Durbin, & Revelle, 2011) suggests that the Hypomanic Personality Scale – often used to assess risk for mania, the key criterion or a diagnosis of BD – may contain three separate factors: mood volatility, social vitality, and excitement. Given our hypothesis that extreme valuing of happiness should be associated with disordered mood, we expected it to correlate with mood volatility but not social vitality or excitement.

Study 2 expanded on Study 1 by recruiting a socioeconomically diverse adult community sample, thus beginning to ascertain the generalizability of the relationship between the extreme valuing of happiness and individual differences in risk for BD. We also assessed and controlled

for depressive symptoms and various demographic features (including multiple indices of socioeconomic status). Study 2 also allowed us to test whether levels of valuing happiness are higher in participants who have been previously diagnosed with BD (according to self-report), compared to individuals who have not been previously diagnosed with any psychiatric disorders.

Study 3 further extended our approach by recruiting a rigorously selected patient sample of clinician-diagnosed participants with remitted DSM-IV BD I (the more severe form of the mood disorder) and a healthy control group, and controlling for clinician-rated symptoms of depression and mania. This enabled us to test whether the extreme valuing of happiness extends to a rigorously-defined patient group and, given that this group was remitted, whether valuing happiness is stable versus tied to the experience of current symptoms. We also assessed and controlled for the extent to which participants have heightened activation of motivational systems linked with extreme goal pursuit. This allowed us to test whether associations between the extreme valuing of happiness and BD were due to extreme goal pursuit in general, or if the associations may be specific to extreme emotional goals (i.e., strongly valuing happiness). Finally, we assessed the number of manic and depressive episodes experienced in the year following the measurement of valuing happiness, thus allowing us to test whether valuing happiness prospectively predicts future manic and depressive episodes, even when controlling for initial symptom levels. These prospective longitudinal analyses underscore the potential causal role of valuing happiness in the illness course and maintenance of BD.

Study 1: Extreme Valuing of Happiness and BD Risk in an Undergraduate Sample

This study was designed to assess the relationship between the extreme valuing of happiness and individual differences in an assessment of BD risk in a large undergraduate sample. Establishing this relationship lays the foundation for examining the extreme valuing of

happiness as a potential risk factor for BD. This first investigation was also designed to systematically rule out potentially confounding phasic symptom profiles (e.g., current symptoms of depression and mania).

Methods

Participants. Participants were 510 undergraduate students (58% female) from Yale University. Participants ranged from 17 to 46 years of age (M = 19.92, SD = 4.32). The sample was ethnically heterogeneous (Caucasian = 53.4%; Asian-American = 19.4%; African-American = 9.6%; Latino/a = 10.2%; Multiethnic/Other = 7.4%). Participants were recruited to complete this study as part of a larger research project and received course credit for participation.

Materials. ***Extreme valuing of happiness.*** The extreme valuing of happiness scale (Mauss et al., 2011) consists of seven items measuring how strongly participants endorse happiness as an emotional goal to an extreme degree[1] rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Responses were averaged to create a mean valuing happiness score. Internal consistency in the present study was α = .72 (M = 4.06, SD = 0.98, range = 1.00-6.71). This measure has been used reliably in previous investigations (i.e., Mauss et al., 2011; Mauss et al., 2012; Ford, Shallcross, Mauss, Floerke, & Gruber, 2013) to index the pursuit of happiness to a potentially extreme degree.

BD risk. The Hypomanic Personality Scale (HPS; Eckblad & Chapman, 1986) was used as a validated and reliable measure of BD risk. It consists of 48 true-false self-report items capturing episodic shifts in emotion, manic behavior and energy levels. Sample items include: "I often feel excited and happy for no apparent reason," and "I frequently find my thoughts are

[1] Items are as follows: (1) How happy I am at any given moment says a lot about how worthwhile my life is. (2) If I don't feel happy, maybe there is something wrong with me. (3) I value things in life only to the extent that they influence my personal happiness. (4) I would like to be happier than I generally am. (5) Feeling happy is extremely important to me. (6) I am concerned about my happiness even when I feel happy. (7) To have a meaningful life, I need to feel happy most of the time.

racing." The HPS has excellent predictive validity for the onset of manic and hypomanic episodes, the core criterion for BD (e.g., Eckblad & Chapman, 1986; Kwapil et al., 2000). Internal consistency of the HPS in the present study was α = .86 (*M* = 17.63, *SD* = 8.08, range = 1-44).

Based on recent evidence that three factors may characterize the HPS scale (Schalet, Durbin, & Revelle, 2011), we calculated three subscales: Mood volatility, which includes 15 items (e.g., "*I seem to be a person whose mood goes up and down easily*"; α = .79, *M* = 5.75, *SD* = 3.54, range = 0-15), Social vitality, which includes 22 items (e.g., "*I seem to have an uncommon ability to persuade and inspire others*"; α = .77, *M* = 8.27, *SD* = 4.25, range = 0-20), and Excitement, which includes 8 items (e.g., "*I often get so happy and energetic that I am almost giddy*"; α = .74, *M* = 2.24, *SD* = 2.09, range = 0-8).

***Depressive symptoms*.** Participants completed the Beck Depression Inventory, Short Form (BDI-SF; Beck & Beck, 1972), a 13-item, self-report measure assessing current symptoms of depression rated on a scale of 0 (e.g., *I do not feel sad*) to 3 (e.g., *I am so sad or unhappy that I cannot stand it*). Internal consistency of the BDI-SF was α = .86 (*M* = 5.05, *SD* = 4.94, range =0-27).

***Manic symptoms*.** Current symptoms of mania were measured with the Altman Self-Rating Mania Scale (ASRM; Altman, Hedeker, Peterson, & Davis, 1997), a five-item self-report inventory with scores ranging from 5 to 25. Scale items include rating the severity in the past week of heightened cheerfulness ("I feel happier or more cheerful than usual all of the time"), inflated self-confidence ("I feel more self-confident than usual all of the time"), reduced need for sleep ("I can go all day or night without any sleep and still not feel tired"), talkativeness ("I talk constantly and cannot be interrupted"), and excessive activity level ("I am constantly active or on

the go all the time"). Internal consistency of the ASRM was α = .75 (*M* = 10.44, *SD* = 3.73, range =5-25).

Procedure. Participants completed all scales using an anonymous online survey, during which other measures not central to the present study were also obtained (for other articles discussing this dataset, see Giovanelli, Hoerger, Gruber & Johnson, 2013; Gruber, Cunningham, Kirkland, & Hay, 2012).

Results

Confounding links with mood symptoms. We first examined how current depressive and manic symptoms were linked with the extreme valuing of happiness and BD risk given the potential confounding effect of current mood symptoms (**Table 1**). Depressive symptoms were indeed associated with the extreme valuing of happiness, $r = .35$, $p < .001$, (95% CI: .26 – .43), and overall BD risk, $r = .15$, $p = .001$, (95% CI: .06 – .24). When examining the subscales of BD risk, depressive symptoms were associated with the mood volatility subscale of BD risk, $r = .38$, $p < .001$, (95% CI: .30 – .46), but not the social vitality subscale of BD risk, $r = -.07$, $p = .11$, (95% CI: -.16 – .02), or the excitement HPS subscale of BD risk, $r = .04$, $p = .32$, (95% CI: -.04 – .13). Manic symptoms were not associated with valuing happiness, $r = -.03$, $p = .55$, (95% CI: -.12 – .06), but were associated with overall BD risk, $r = .32$, $p < .001$, (95% CI: .24 – .41). When examining the subscales of BD risk, manic symptoms were associated with the mood volatility subscale of BD risk, $r = .13$, $p = .003$, (95% CI: .04 – .22), the social vitality subscale of BD risk, $r = .33$, $p < .001$, (95% CI: .25 – .42), and the excitement subscale of BD risk, $r = .32$, $p < .001$, (95% CI: .23 – .40).

Links between the extreme valuing of happiness and BD risk. We then examined whether the extreme valuing of happiness was associated with BD risk. Bivariate correlations

indicated that valuing happiness was indeed positively correlated with overall BD risk, $r = .19$, $p < .001$, (95% CI: .10 – .28). Similar results emerged when controlling for manic symptoms, depressive symptoms, age, gender, ethnicity (Caucasian vs. not) and years of education in a partial correlation, *partial* $r = .16$, $p = .001$, (95% CI: .07 – .25) (**Table 1**)

When examining the subscales of BD risk, the extreme valuing of happiness was positively correlated with the mood volatility subscale of BD risk, $r = .33$, $p < .001$, (95% CI: .24 – .42) (similar results emerged when controlling for the above variables, $r = .27$, $p < .001$, (95% CI: .17 – .36)), and the excitement subscale of BD risk, $r = .14$, $p = .003$, (95% CI: .05 – .23) (controlling for the above variables, $r = .13$, $p = .006$, (95% CI: .04 – .22)), but not the social vitality subscale of BD risk, $r = .004$, $p = .93$, (95% CI: -.09 – .09) (controlling for the above variables, $r = .02$, $p = .65$, (95% CI: -.07 – .11)). Analyses comparing the strength of these correlations indicated that the extreme valuing of happiness was correlated most strongly with mood volatility subscale, as this correlation was larger than the correlation with the excitement subscale, *Steigers* $z = 4.47$, $p < .001$, and larger than the correlation with the social volatility subscale, *Steigers* $z = 6.331$, $p < .001$. The correlation between the extreme valuing of happiness and the excitement subscale was also larger than the correlation with the social volatility subscale, *Steigers* $z = 2.67$, $p = .008$.

Discussion

This study was the first investigation, to our knowledge, to examine the connection between the extreme valuing of happiness and risk for BD. Results suggest that valuing happiness was associated with risk for BD – indicated by elevated scores on the hypomanic personality scale – and that this was independent of demographic factors (i.e., age, gender, ethnicity, years of education). Importantly, this relationship was not accounted for by current

mood symptoms, thus ruling out the possibility that symptoms of BD risk (e.g., manic symptoms, depressive symptoms) led participants to value happiness much more highly. Additionally, the extreme valuing of happiness was not significantly associated with mania symptoms, suggesting that valuing happiness may is not simply an attribute of the elevated mood or increased activity level associated with BD. It is also important to note that depressive symptoms are not just a potential confound, they are also a key correlate of valuing happiness (e.g., Mauss et al., 2011). However, above and beyond the link between valuing happiness and depression, there is still a significant link between valuing happiness and risk for BD.

Consistent with our hypotheses, the extreme valuing of happiness was most strongly linked with the mood volatility subscale of BD risk, compared with the social vitality and the excitement subscales. These findings suggest that the potential risk posed by the extreme valuing of happiness may be characterized by its link with mood volatility, implying a specific link with disordered mood and emotion regulation.

Study 2: Extreme Valuing of Happiness and BD Risk in an Adult Community Sample

This study was designed to assess the relationship between the extreme valuing of happiness and individual differences in BD risk in a large adult community sample. Replicating the link between the extreme valuing of valuing happiness and BD risk would further strengthens the foundation for examining valuing happiness as a potential risk factor for BD. Study 2 also allowed us to examine whether levels of valuing happiness were higher in participants who reported having been previously diagnosed with BD, thus beginning to ascertain whether valuing happiness is associated with the disorder itself, in addition to risk for the disorder.

Methods

Participants. A community sample of participants (N = 241; 55% female) diverse in age (M_{age} = 42.88 years, *range* = 21-73 years) and socioeconomic status (*range* of educational attainment = junior high school to graduate degree; *range* of annual household income = $10,000 or below to $100,000 and above), was recruited from the Denver metro area to complete this study as part of a larger research project. The sample was ethnically mixed but largely Caucasian (White = 86.6%; Asian = 1.3%; Black or African-American = 2.1%; American Indian or Alaskan Native = 2.5%; Native Hawaiian or Other Pacific Islander = 0.8%; Multiethnic = 6.7%).

Measures. ***Extreme valuing of happiness.*** Participants completed the same scale as in Study 1 (α = .77; M = 4.01, SD = 1.05, range = 1.57-7.00).

BD risk. Participants completed the same HPS scale as in Study 1 (α = .90; M = 14.29, SD = 8.63, range = 0-42). We also calculated three subscales (Schalet, Durbin, & Revelle, 2011): Mood volatility (α = .83, M = 5.03, SD = 3.64, range = 0-14), Social vitality (α = .82, M = 6.54, SD = 4.36, range = 0-18), and Excitement (α = .74, M = 1.54, SD = 1.83, range = 0-8).

Depressive symptoms. The Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996) consists of 21 items[2] assessing current depressive symptoms rated on a scale of 0 (e.g., *I do not feel sad*) to 3 (e.g., *I am so sad or unhappy that I cannot stand it*) that were summed to create a composite depressive symptom score (α = .94, M = 9.97, SD = 9.40, range =0-48).

Procedure. Participants reported their demographic information and whether they had been diagnosed with any psychiatric disorders at any point in their lives in an online survey lasting approximately 60 minutes. Six months later, participants completed another online survey lasting approximately 60 minutes assessing the extreme valuing of happiness and BD risk. Other measures not central to the present study were obtained during both surveys (for other articles

[2] One item referencing suicidal ideation was removed due to IRB concerns.

discussing this dataset, see Gruber, Kogan, Quoidbach, & Mauss, 2013; Hopp et al., 2013; Hopp, Troy, & Mauss, 2011; Kogan, Gruber, Shallcross, Ford, & Mauss, 2013; Mauss, Troy, & LeBourgeois, 2013; Troy, Shallcross, Davis, & Mauss, 2013; Troy, Shallcross, & Mauss, 2013; Shallcross, Ford, Floerke, & Mauss, 2013).

Results

Analyses on full sample. ***Confounding links with mood symptoms.*** We first examined how current depressive symptoms were linked with the extreme valuing of happiness and BD risk within the entire sample of participants given the potential confounding effect of current mood symptoms (**Table 1**)[3]. Depressive symptoms were indeed associated with the extreme valuing of happiness, $r = .44$, $p < .001$, (95% CI: .33 – .56), and overall BD risk, $r = .27$, $p < .001$, (95% CI: .12 – .41). When examining the subscales of BD risk, depressive symptoms were associated with the mood volatility subscale of BD risk, $r = .50$, $p < .001$, (95% CI: .35 – .61), but not the social vitality subscale of BD risk, $r = .02$, $p = .85$, (95% CI: -.14 – .17), or the excitement HPS subscale of BD risk, $r = .18$, $p = .024$, (95% CI: .02 – .33).

Links between the extreme valuing of happiness and BD risk. We then examined whether the extreme valuing of happiness was associated with BD risk within the entire sample of participants. Bivariate correlations indicated that valuing happiness was indeed positively correlated with overall BD risk, $r = .35$, $p < .001$, (95% CI: .20 – .48). Similar results emerged when controlling for depressive symptoms, age, gender, ethnicity (Caucasian vs. not), years of education, annual household income, employment status (employed vs. not) and relationship status (partnered vs. not) in a partial correlation, *partial* $r = .33$, $p = .002$, (95% CI: .13 – .53) (**Table 1**).

[3] Manic symptoms were not assessed in the present sample.

When examining the subscales of BD risk, the extreme valuing of happiness was positively correlated with the mood volatility subscale of BD risk, $r = .43$, $p < .001$, (95% CI: .28 – .55) (similar results emerged when controlling for the above variables, $r = .34$, $p = .001$, (95% CI: .15 – .55)), the excitement subscale of BD risk, $r = .28$, $p < .001$, (95% CI: .13 – .42) (controlling for the above variables, $r = .22$, $p = .038$, (95% CI: .01 – .47)), and the social vitality subscale of BD risk, $r = .17$, $p = .03$, (95% CI: .02 – .31) (controlling for the above variables, $r = .22$, $p = .036$, (95% CI: .01 – .40)). Analyses comparing the strength of these correlations indicated that the extreme valuing of happiness was correlated most strongly with mood volatility subscale, as this correlation was larger than the correlation with the excitement subscale, *Steigers* $z = 2.43$, $p = .015$, and larger than the correlation with the social volatility subscale, *Steigers* $z = 3.57$, $p < .001$. The correlation between the extreme valuing of happiness and the excitement subscale was not significantly larger than the correlation with the social volatility subscale, *Steigers* $z = 1.53$, $p = .126$.

Analyses on undiagnosed subsample. Within the full sample, a subsample of participants reported having previously been diagnosed with BD ($n = 19$). Thus, to ensure that the positive correlation between the extreme valuing of happiness and BD risk was not being driven by this subsample, or by individuals who reported being diagnosed with other mood disorders (e.g., MDD), we ran the correlation between the extreme valuing of happiness and BD risk again, including only participants who reported having not been previously diagnosed with any psychiatric disorder, including BD ($n = 151$). In these analyses, valuing happiness was still significantly correlated with risk for BD, $r = .28$, $p = .004$, (95% CI: .08 – .42), even when controlling for depressive symptoms, age, gender, ethnicity (Caucasian vs. not), years of

education, annual household income, employment status (employed vs. not) and relationship status (partnered vs. not) in a partial correlation, *partial r* = .34, p = .008, (95% CI: .08 – .52).

When examining the subscales of BD risk, the extreme valuing of happiness was positively correlated with the mood volatility subscale of BD risk, r = .35, p < .001, (95% CI: .16 – .49) (similar results emerged when controlling for the above variables, r = .37, p = .004, (95% CI: .12-.60)), but the correlations were weaker when examining the excitement subscale of BD risk, r = .15, p = .128, (95% CI: -.04 – .33) (controlling for the above variables: r = .14, p = .294, (95% CI: -.14 – .45)), and the social vitality subscale of BD risk, r = .17, p = .083, (95% CI: -.02 – .30) (controlling for the above variables: r = .29, p = .030, (95% CI: .02 – .44)). Analyses comparing the strength of these correlations indicated that the extreme valuing of happiness was correlated most strongly with mood volatility subscale, as this correlation was larger than the correlation with the excitement subscale, *Steigers z* = 2.46, p = .014, and larger than the correlation with the social volatility subscale, *Steigers z* = 2.03, p = .043. The correlation between the extreme valuing of happiness and the excitement subscale was not significantly larger than the correlation with the social volatility subscale, *Steigers z* < 1, p = .83.

Analyses on Bipolar Disorder subsample. To take full advantage of the fact that 19 participants in the sample reported previously having been diagnosed with BD, we then examined whether this BD group reported higher levels of valuing happiness compared the nondiagnosed group. Consistent with our hypotheses, the extreme valuing of happiness was higher in the BD group (M = 4.67, SD = 1.33) compared to the nondiagnosed group (M = 3.81, SD = 0.90), F(1, 169) = 13.48, p < .001, η_p^2 = .07, (95% CI: .02 – .16; 90% CI: .02 – .14[4]), even when controlling for the aforementioned control variables by entering them as covariates, F(9,

[4] See Steiger (2004) for a discussion of whether the most appropriate confidence interval for eta squared statistics is 95% or 90%.

103) = 4.38, p = .039, η_p^2 = .04, (95% CI: .00 – .14; 90% CI: .001 – .12) (see **Table 2** for group comparisons of control variables).

Discussion

These findings replicated and extended the findings of Study 1. The extreme valuing of happiness was associated with increased BD risk – indicated by elevated scores on the hypomanic personality scale – and this was independent of demographic factors, including a variety of variables assessing socioeconomic status (i.e., employment, income, relationship status, and ethnicity). The pattern of associations between the extreme valuing of happiness and increased BD risk was also most strongly tied to the BD risk subscale most closely tied with disordered emotion regulation – mood volatility. These results replicated when excluding participants who reported having previously been diagnosed with BD (and who were thus no longer technically "at risk" for the development of BD). Establishing this relationship in a diverse community sample attests to the robust nature of this effect and to its potential generalizability to many different types of people.

Furthermore, this study demonstrated that levels of valuing happiness are higher in a sample of individuals previously diagnosed with BD, compared to a control sample. Due to the small sample size and the self-report measure of BD diagnosis, these results should be viewed as preliminary. In spite of this, these results suggest that the extreme valuing of happiness may be linked with (a) the *onset of BD* because it was associated with risk for BD in healthy individuals who had not been diagnosed with BD, and (b) the *maintenance of BD* because it was higher in individuals previously diagnosed with BD. These results set the stage for examining mean differences in a more rigorously selected patient sample, controlling for manic and depressive

symptoms, and examining causality more directly by using prospective analyses of actual illness course rather than a self-reported risk measure.

Study 3: Extreme Valuing of Happiness in a Clinically Diagnosed BD Patient Sample

Thus far, the relationship between BD risk and the extreme valuing of happiness has been supported, but only within non-clinically diagnosed populations. Although an important first step, it was critical to examine valuing happiness within a DSM-IV diagnosed BD sample to examine whether valuing happiness can predict clinical outcomes. Clinician-rated depressive and manic symptoms were also collected to rule out the alternative hypothesis that current symptoms cause associations between valuing happiness and history of BD. Prospective measurement of illness course was also assessed to ascertain whether the extreme valuing of happiness plays a causal role in the maintenance of BD over time.

Methods

Participants. Participants were 32 individuals diagnosed with BD type I who were currently remitted (neither manic nor depressed) and 30 healthy controls (CTL) who did not meet current or past criteria for any DSM-IV-TR Axis I disorder. Remitted BD participants were selected to examine more stable patterns of emotional goals independent of current mood (Gruber, Harvey, & Johnson, 2009; Gruber, Harvey & Purcell, 2011). Both BD and CTL participants were recruited from the community using online advertisements and flyers posted in New Haven, CT and surrounding communities. Exclusion criteria included history of severe head trauma, stroke, neurological disease, severe medical illness (e.g., autoimmune disorder, HIV/AIDS), or alcohol or substance abuse in the past six months. BD and CTL participants were matched on age, gender, race (Caucasian vs. other), years of education, income, employment status, and partnership status (partnered vs. not). Demographic and clinical characteristics are

provided in **Table 2**.

The average age of onset in the BD group was 19.95 years (*SD* = 6.46) and average illness duration was 10.89 years (*SD* = 9.53). For the BD group, the lifetime average of manic/hypomanic episodes was 8.55 (*SD* = 12.63), the lifetime average of major depressive episodes was 11.57 (*SD* =17.16), and the average number of current psychotropic medications was 2.00 (*SD* = 1.52). BD participants were not excluded on the basis of comorbid disorders given that BD is commonly comorbid with other disorders (e.g., Kessler et al., 2003; Kessler, Chiu, Demler, & Walter, 2005). However, we verified that BD disorder was the primary diagnosis for the BD group (Di Nardo, Moras, Barlow, Rapee, & Brown, 1993). Participants in the CTL group did not meet criteria for any current or lifetime Axis I disorders assessed (i.e., anxiety disorders, major depression, mania/hypomania, dysthymia, schizophrenia, schizoaffective disorder, substance abuse, eating disorders, hypochondriasis, pain disorder, and adjustment disorders).

Materials. ***Manic symptoms.*** Current symptoms of mania were measured using the Young Mania Rating Scale (YMRS; Young, Biggs, Ziegler, & Meyer, 1978). The YMRS is an 11-item, clinician-rated measure of current manic symptoms with scores ranging from 0 to 60, with higher scores indicating greater manic severity. Scores ≥ 7 represent clinically significant manic symptom levels. Intra-class correlations (ICC; Shrout & Fleiss, 1979) for absolute agreement between the original interviewer and an independent rater for approximately one-third of study participants (*n* = 23) were strong for the YMRS (ICC= .98).

Depressive symptoms. Current symptoms of depression were measured using the Inventory of Depressive Symptomatology (IDS-C; Rush, Gullion, Basco, Jarrett, & Trivedi 1996). The IDS-C is a 30-item, clinician-rated measure of current depressive symptoms with

scores ranging from 0 to 84, with higher scores indicating greater depressive severity. Scores ≥ 11 represent clinically significant depressive symptom levels. The IDS-C has been validated in individuals with BD (Trivedi et al., 2004) and strongly correlates with other measures of depression severity (Rush et al., 1996). ICCs for absolute agreement between the original interviewer and an independent rater for approximately one-third of study participants (n = 23) were also strong for the IDS-C (ICC= .98).

Diagnostic evaluation. Diagnoses of BD and CTL were confirmed using the Structured Clinical Interview for DSM-IV (SCID-IV; First, Spitzer, Gibbon, & Williams, 1997) that were administered by either a trained clinical psychology faculty member, one of three psychology doctoral candidates, or a post-baccalaureate research fellow. Approximately one third (n = 29) of videotaped interviews were rated by an independent reviewer and ratings matched 100 % (κ = 1.0) of primary diagnoses. Current remitted mood status (i.e., neither manic, depressed, nor mixed mood state) for all groups was verified according to SCID-IV criteria and cutoff scores on the YMRS (≤ 7), and IDS-C (≤ 11).

Extreme valuing of happiness. Participants completed the same scale as in Studies 1 and 2 (α = .72; M = 3.77, SD = 1.07, range = 1.71-6.14). See **Table 2** for descriptive statistics.

Motivational systems linked with general goal pursuit. The extent to which participants are more likely to engage in goal pursuit in general was assessed using the three Behavioral Approach System subscales from the Behavioral Approach System/Behavioral Inhibition System Scale (Carver & White, 1994). The Drive subscale consists of four items measuring to what extent participants engage in the persistent pursuit of desired goals ("I go out of my way to get things I want") (α = .87; M = 2.78, SD = 0.71, range =1.0-4.0). The Fun-Seeking subscale consists of four items measuring the desire for new rewards and the willingness to approach a

potentially rewarding event ("I crave excitement and new sensations") (α = .76; *M* = 2.91, *SD* = 0.64, range =1.5-4.0). The Reward-responsiveness subscale consists of five items measuring positive responses to the anticipation or attainment of reward ("When I'm doing well at something I love to keep at it") (α = .80; *M* = 3.34, *SD* = 0.47, range = 2.4-4.0). All items were rated on a scale of 1 (*very true for me*) to 4 (*very false for me*).[5]

Past and prospective illness course. We assessed illness course parameters (the number of total lifetime manic and depressive episodes, and the number of manic and depressive episodes experienced in the last 12 months) using the National Institute of Mental Health retrospective Life-Charting Methodology (NIMH-LCMr; Leverich & Post, 1993). The NIMH-LCMr procedure involves charting a participant's course of illness from the date of illness onset. The NIMH-LCMr has been well validated and used in samples of bipolar participants (e.g., Denicoff et al., 1997; Leverich & Post, 1993).

Procedure. After obtaining informed consent, the SCID-IV was administered to obtain diagnostic and symptom severity information. Number of lifetime manic episodes (range = 1-99[6], *M* = 11.38, *SD* = 20.25) and depressive episodes (range = 0-99, *M* = 14.39, *SD* = 23.05) were assessed in the participants diagnosed with BD disorder using the NIMH-LCMr. All participants then completed a series of procedures not relevant to the present study (for other

[5] Our use of covariates was as follows: Depressive symptoms were used as a covariate in Studies 1-3. Manic symptoms were used as a covariate in the studies in which they were assessed (Studies 1 and 3). The same basic demographic characteristics were used as covariates in Studies 1-3: age, gender, ethnicity, and years of education. Additional demographic characteristics were used as covariates in the studies in which they were assessed (Studies 2 and 3): household income, employment status, and relationship status. The BAS subscales were used as covariates in the study in which they were assessed (Study 3). This slight inconsistency in covariates across the three studies is due to not all covariates being assessed in all three studies.

[6] One BD patient reported over 100 manic episodes and over 100 depressive episodes in his/her lifetime. This value was truncated to 99 during data collection to avoid the undue influence of extreme outliers. Given that these lifetime counts of manic and depressive episodes are used only as a control variable within a subset of the present analyses, we retained this participant in the dataset. However, when we exclude this participant, the pattern of results remains unchanged.

articles discussing this dataset, see Gilbert, Nolen-Hoeksema, & Gruber, 2013; Gruber, Kogan, Mennin, & Murray, in press; Gruber, Purcell, Perna, & Mikels, 2013; Kang & Gruber, 2013; Purcell, Phillips, & Gruber, 2013). At the end of the session, participants completed the extreme valuing of happiness and general goal pursuit scales using an online survey. Twelve months later, BD participants were contacted by phone and trained clinical interviewers assessed the number of manic episodes (range = 0-2, M = 0.50, SD = 0.76) and depressive episodes (range = 0-2, M = 0.90, SD = 0.79) experienced in the past 12 months using the NIMH-LCMr. For both the lifetime number of episodes and episodes experienced in the past year, recovery from an episode was defined as no manic or depressive episode for at least two months. Otherwise, SCID DSM-IV-TR criteria were followed to determine the presence or absence of manic or depressive episodes.

Results

We first examined initial symptoms assessed in the first session as potential confounds. Although both groups scored below standardized cutoffs for manic symptoms (YMRS ≤ 7) and depressive symptoms (IDS-C ≤ 11), the BD group scored significantly higher for depressive symptoms, $F(1, 60) = 10.27$, $p = .002$, $\eta_p^2 = .15$, (95% CI: .02 – .31; 90% CI: .03 – .28) and marginally higher for manic symptoms, $F(1, 60) = 2.99$, $p = .089$, $\eta_p^2 = .05$, (95% CI: .00 – .18; 90% CI: .00 – .16) compared to the CTL group. Third, as seen in **Table 2**, the two groups did not differ with respect to age, gender, ethnicity, education, employment, or romantic partnership status, ps > .05.

We next conducted a univariate ANOVA to test group differences (BD, CTL) in valuing happiness. Results indicated that valuing happiness scores were higher for the BD group (M = 4.11, SD = 1.07) than the CTL group (M = 3.18, SD = 0.91), $F(1, 60) = 13.47$, $p = .001$, η_p^2 =

.18, (95% CI: .04 – .35; 90% CI: .06 – .32). Comparable results were obtained in a parallel ANCOVA analysis when simultaneously controlling for both manic and depressive symptoms, motivational systems linked with general goal pursuit (assessed with the three BAS subscales: Drive, Fun-Seeking, and Reward-Responsiveness), and demographic factors (age, gender, ethnicity, education, income, employment, or relationship status), $F(13, 44) = 4.32$, $p = .043$, $\eta_p^2 = .09$, (95% CI: .00 – .27; 90% CI: .001 – .23).

Finally, we examined within the BD group whether the extreme valuing of happiness predicted the number of manic and depressive episodes experienced during the year subsequent to the assessment of valuing happiness. Twenty of the original 32 BD participants completed the 12-month follow-up session. Of these participants, thirteen reported no manic episodes, four reported one manic episode, and three reported two manic episodes. Additionally, seven reported no depressive episodes, eight reported one depressive episode, and five reported two depressive episodes. To account for the non-normal distribution of the frequency of these prospective manic and depressive episodes, Poisson regression models were used to examine these outcomes.

Within these participants, there was a significant association between the extreme valuing of happiness and number of manic episodes experienced in the subsequent year, $B = .82$, $SE = 0.36$, Wald $\chi^2 = 5.24$, $p = .022$, (95% CI: 0.12 – 1.53). This association held when controlling for initial levels of clinician-rated mania and depressive symptoms and lifetime number of manic and depressive episodes as covariates, $B = .91$, $SE = 0.43$, Wald $\chi^2 = 4.39$, $p = .036$, (95% CI: 0.06 – 1.77). The extreme valuing happiness was not significantly associated with the number of depressive episodes experienced in the subsequent year, $B = .39$, $SE = 0.24$, Wald $\chi^2 = 2.51$, $p = .113$, (95% CI: -0.09 – 0.87), but became a significant predictor when controlling for initial levels of clinician-rated mania and depressive symptoms and lifetime number of manic and

depressive episodes as covariates, $B = .72$, $SE = 0.33$, Wald $\chi^2 = 4.76$, $p = .029$, (95% CI: 0.07 – 1.37).

Discussion

Study 3 replicated and extended the findings of Studies 1 and 2. Results indicate that the extreme valuing of happiness is stronger for those with clinician-diagnosed remitted BD, compared to control participants. Importantly, this relationship holds when accounting for clinician-rated current manic and depressive symptoms and when controlling for motivational systems linked with general goal pursuit. The fact that these findings were obtained in a remitted group with a history of BD, and that the effects hold when controlling for current mood symptoms, points to strong valuing of happiness as a stable risk factor for BD. Furthermore, the fact that that these effects were independent of general goal pursuit suggests that the extreme *emotional* goals like strongly valuing happiness may represent a unique risk factor for BD.

Importantly, demonstrating that the extreme valuing of happiness prospectively predicts a worse illness course for BD patients, even when controlling for initial symptoms, is an important step toward establishing the causal role that high levels of valuing happiness can play in psychological health. Although these analyses have low power and may be most appropriately viewed as preliminary, the fact that the extreme valuing of happiness predicted both manic and depressive episodes suggests that valuing happiness is a risk factor for both aspects of BD (the mania aspect, signified by elevated mood, irritability, and risk-taking; and also the depression aspect, signified by anhedonia and amotivation).

General Discussion

We propose that the extreme valuing of happiness is a general risk factor for mood disorders. Previous research is largely consistent with this claim – suggesting that extreme

valuing of happiness is associated with depression (Mauss et al., 2011; Ford et al., in press). However, to assess whether the extreme valuing of happiness is linked with mood disorders more generally, it is critical to assess mood disorders other than depression. Thus, the current investigation examined whether the extreme valuing of happiness was associated with risk for BD in undergraduate and community samples (Studies 1 and 2), a history of diagnosis of BD (Studies 2 and 3), and prospective BD illness course (Study 3).

Extreme Valuing of Happiness and Bipolar Disorder

In support of our hypothesis, we found an association between the extreme valuing of happiness and risk for, diagnosis of, and illness course for BD. In support of a relatively stable (versus transient) link between the extreme valuing of happiness and BD, the association between valuing happiness and BD held when controlling for current mood symptoms rated by the participants themselves (Study 1 and 2) and by trained clinicians (Study 3). The link between BD and extreme valuing of happiness held when controlling for depressive symptoms, suggesting this link is not simply due to those with or at risk for BD experiencing higher levels of depressive symptoms (Study 1-3). The link between BD and extreme valuing of happiness also held when controlling for motivational systems associated with pursuing goals to an extreme degree in general (Study 3). Given that prior research has established links between BD and the pursuit of extreme goals in general (see Johnson, 2005, for a review), it was important to provide evidence that the present pattern of results appears not to be due simply to those higher in the extreme valuing of happiness or those with BD being more likely to pursue all goals to an extreme degree.

We propose that the extreme valuing of happiness may be a risk factor for the onset and maintenance of BD, and not simply a consequence of BD. In addition to the experimental

evidence demonstrating a causal link between valuing happiness and worse mood outcomes (Mauss et al.; 2011; 2012), two sets of evidence from the present data support the interpretation that the extreme valuing of happiness may be a risk factor for BD rather than merely a consequence of BD: (a) In Study 3, the extreme valuing of happiness prospectively predicted worse illness course for BD patients over the year following the assessment of valuing happiness, even when controlling for initial levels of mania and depressive symptoms. While these findings do not speak to the role of the extreme valuing of happiness in the *onset* of BD, they do offer compelling evidence for the causal role of the extreme valuing of happiness in the *maintenance* of BD over time. (b) If the extreme valuing of happiness were purely a consequence of the experience of BD (rather than a risk factor), then the relationship between BD and valuing happiness should be weakened after controlling for current symptoms of depression and mania. However, we still found a relationship between the extreme valuing of happiness and BD when controlling for current symptoms and when assessing a sample of remitted/asymptomatic BD. Taken together, these considerations point toward the extreme valuing of happiness as a risk factor for BD.

Theoretical Implications

This investigation makes at least two theoretical contributions to the domains of emotion values and psychological health. First, by assessing the extreme valuing of happiness, this investigation adds to the nascent literature on emotional values (i.e., how people want to feel). Happiness is generally highly valued (Eid & Diener, 2001; Rusting & Larsen, 1995; Tsai, 2007). The present findings suggest that encouraging a mindset to maximize happiness at any cost can be counterproductive, in that it might increase risk for psychological-health problems such as BD. Importantly, the present findings do not mean that the valuing of happiness is *always*

maladaptive (cf. Ford & Mauss, 2013). Valuing happiness – even to an extreme – could lead to adaptive outcomes if people are given the right tools to obtain it (e.g., emotion regulatory abilities; cf. Gilbert, 2006; Lyubomirsky, 2008) or if they define positive emotion more broadly than their personal emotional state (e.g., happiness based on social engagement; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Keltner, 2009; Kesebir & Diener, 2008; Konow & Earley, 2008; Ryff & Singer, 2008).

Second, extending research on the correlates of extreme valuing of happiness into the context of bipolar disorder furthers helps us understand what might account for the link between valuing happiness and mood disorders. Previous research has demonstrated a link between the extreme valuing of happiness and depression (Ford et al., in press; Mauss et al., 2011). Indeed, the mean level of the extreme valuing of happiness in the present remitted Bipolar patient sample, $M = 4.11$ ($SD = 1.07$, $n = 32$), is comparable to the mean level in a previously published remitted Major Depressive Disorder sample, $M = 3.97$ ($SD = 1.01$, $n = 31$) (Ford et al., in press). The fact that the extreme valuing of happiness is positively associated with both depression and bipolar disorder might – at first glance – be perplexing given these mood disorders are characterized by opposing patterns of mood (i.e., depressed versus elevated). However, BD and MDD share disordered emotion regulation. The fact that the extreme valuing of happiness is linked with both BD and MDD suggests that the extreme valuing of happiness may be a risk factor for mood disorders characterized by disordered emotion regulation, perhaps because valuing happiness promotes disordered emotion regulation. This is consistent with our finding that the risk conferred by the extreme valuing of happiness was strongest for the mood volatility component of risk for BD – the subscale most closely linked with disordered emotion regulation – rather than the other social or positive emotionality components of BD.

Although we have speculated here that the extreme valuing of happiness may shape the experience of mood disorders through disordered emotion regulation – a common feature of BD and MDD – these mood disorders differ in terms of the precise ways in which emotion regulation is disordered. It may be that valuing happiness is associated with different types of disordered emotion regulation in the two disorders. For example, the extreme valuing of happiness may affect BD by making it more likely for individuals to engage in risk-taking activities in pursuit of that happiness. Thus, the extreme valuing of happiness may promote misguided emotion regulation attempts (Gross, 2014; Mauss & Tamir, 2014; Tamir & Ford, 2012b), as individuals strive to maximize happiness at all costs. The notion of seeking happiness at any cost is also consistent with biological models of BD, which emphasize the role of dysregulated dopamine (Berk et al., 2007). The dopaminergic system is linked with intense "wanting" (Berridge & Robinson, 2003), and one pathway through which this intense "wanting" could shape BD is through the intense wanting of emotional states, like happiness. Conversely, the extreme valuing of happiness may contribute to MDD by making it more likely that individuals engage in rumination in pursuit of happiness. While the current investigation was not designed to parse apart the precise mechanisms by which the extreme valuing of happiness exerts its deleterious effects, the present results suggest that wanting to feel happiness to an extreme degree may have important negative implications for psychological health.

Limitations and Future Directions

This research makes a novel contribution to our understanding of the involvement of emotional values in BD. It also has limitations that suggest directions for future research. First, while evidence from the present studies help support the conclusion that the extreme valuing of happiness may be a risk factor for BD rather than simply a correlate (e.g., prospective analyses),

until further experimental or intervention studies are conducted, it is difficult to draw firm conclusions about the causal direction of the link between valuing happiness and BD. Additionally, while study 3 provides evidence for the prospective role of the extreme valuing of happiness in BD, studies 1 and 2 provide evidence for this role in risk for BD – or hypomanic personality – suggesting that future studies would also benefit from assessing hypomanic personality and not just BD.

Second, future research may be served by examining other types and variations of emotional values. Our focus in the present investigation was happiness because happiness is such a common value (Barrett, 1996; Rusting & Larsen, 1995; Tamir & Ford, 2012a). However, happiness may not be the only type of emotional value that is involved in BD, and not all people try to increase their happiness. For example, while some people try to feel less unpleasant emotion (e.g., Rusting & Larsen, 1995), others try to feel more unpleasant emotion (e.g., Hackenbracht & Tamir, 2010; Tamir & Ford, 2009; Tamir & Ford, 2012b). Each emotional value may have distinct effects on psychological health (Tamir & Ford, 2012a). It would be interesting to examine whether the extreme valuing of happiness is empirically distinct from these other emotional values, such as extreme *de*valuing of sadness. Similarly, the present investigation assessed extreme valuing of happiness, and the present findings may not generalize to a more mild and potentially adaptive focus on experiencing positive states. Further research would benefit from examining the full spectrum of intensities of various emotional values.

Third, although examining the precise mechanisms by which valuing happiness exerts its deleterious effects were beyond the scope of the current investigation, exploring such specific mechanisms (e.g., disordered emotion regulation) will be an important next step in examining how the extreme valuing of happiness might lead to worse psychological health. Given our

proposal that the extreme valuing of happiness is linked with disordered emotion regulation, it is also an important future direction to assess these emotional values in other disorders characterized by disordered emotion regulation (e.g., Borderline Personality Disorder) to better understand this possible mechanism.

Finally, while there is some reason to believe that happiness is a universal value (Diener, Sapyta, & Suh, 1998), happiness can have different meanings across cultures (Lu & Gilmour, 2004; Uchida, Norasakkunkit, & Kitayama, 2004). Thus, measuring valuing happiness and its psychological health correlates across cultures is an important future direction.

Concluding Comment

The present studies used both analogue and patient samples and both cross-sectional and longitudinal data to provide evidence that the extreme valuing of happiness is associated with risk for, diagnosis of, and illness course for BD. These findings highlight the importance of taking into account how people want to feel to better understand psychological health.

Author Note

B. Q. F. performed data analysis, results interpretation, and drafted the paper. I. B. M. and J. G. developed the study concepts, designed the studies, and provided critical revisions. All authors approved the final version of the paper for submission.

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Table 1. Correlations between valuing happiness, BD risk, symptoms, and demographic factors (Studies 1 and 2).

	Study 1		Study 2				Study 3	
	Full sample (N = 510)		Full sample (N = 241)		Undiagnosed participants only (*n* = 151)		BD (*n* = 32)	CTL (*n* = 30)
	Valuing happiness	BD risk (Full Scale)	Valuing happiness	BD risk (Full Scale)	Valuing happiness	BD risk (Full Scale)	Valuing happiness	
BD risk (Full Scale)	.19*	--	.35*	--	.28*	--	--	--
Mood volatility	.33*	.79*	.43*	.84*	.35*	.83*	--	--
Social vitality	.00	.81*	.17*	.87*	.17†	.89*	--	--
Excitement	.14*	.73*	.28*	.78*	.15	.75*	--	--
Depressive symptoms	.35*	.15*	.44*	.27*	.29*	.14	.25	.03
Manic symptoms	-.03	.32*	--	--	--	--	-.27	-.19
Motivational systems linked with general goal pursuit								
Drive	--	--	--	--	--	--	.20	.04
Fun-seeking	--	--	--	--	--	--	.19	.03
Reward-responsiveness	--	--	--	--	--	--	.36*	.33†
Demographics								
Age	.02	-.02	-.12†	-.26*	-.18*	-.23*	.04	.21
Gender *(M = 0, F = 1)*	.04	-.09*	-.05	-.13†	-.13	-.09	-.40*	.17
Ethnicity (Caucasian vs. other)	-.06	.03	.08	.06	.04	.03	-.39*	-.45*
Education (years)	-.01	-.01	-.05	-.16*	-.04	-.13	-.16	-.04
Household income	--	--	-.10	-.06	-.09	-.09	-.01	-.05
Employment (Employed vs. not)	--	--	.09	.01	.07	-.03	.07	-.12
Relationship status (Partnered vs. not)	--	--	-.08	-.03	-.10	-.12	-.26	-.13

Note. * $p < .05$, † $p < .10$.

Table 2. Descriptive statistics for self-reported BD participants and undiagnosed participants (in Study 2) and clinician-diagnosed BD patients and CTL participants (Study 3).

	Study 2			Study 3		
	BD (n = 16)	Undiagnosed (n = 151)	Statistic	BD (n = 32)	CTL (n = 30)	Statistic
Valuing happiness	4.67 (1.33)	3.81 (0.90)	F = 13.48*	4.11 (1.07)	3.18 (.91)	F = 13.47*
Depressive symptoms	17.59 (11.55)	7.26 (7.67)	F = 26.88*	4.22 (3.27)	2.00 (1.98)	F = 10.27*
Manic symptoms	--	--	--	1.84 (1.89)	1.17 (1.05)	F = 2.99†
Motivational systems linked with general goal pursuit						
Drive	--	--	--	2.89 (0.76)	2.66 (0.64)	F = 1.75
Fun-seeking	--	--	--	3.08 (0.71)	2.73 (0.51)	F = 4.74*
Reward-responsiveness	--	--	--	3.42 (0.45)	3.27 (0.49)	F = 1.54
Demographics						
Age	40.89 (10.25)	42.45 (13.38)	F = 0.24	30.81 (9.61)	31.45 (9.13)	F = 0.07
Female (%)	63.2%	53.0%	χ^2= 0.70	65.6%	67.9%	χ^2= 0.03
Caucasian (%)	88.9%	84.6%	χ^2= 0.24	90.6%	90.0%	χ^2= 0.01
Education (years)	4.79 (1.08)	5.78 (0.90)	F = 19.61*	15.08 (2.21)	15.95 (2.41)	F = 2.17
Income	3.35 (1.69)	5.56 (2.14)	F = 16.65*	3.16 (1.66)	3.57 (1.57)	F = 0.99
Employed (%)	76.9%	76.4%	χ^2= 0.00	46.9%	66.7%	χ^2= 2.47
Partnered (%)	38.9%	59.3%	χ^2= 2.74†	40.6%	56.7%	χ^2= 1.60

Note: *p < 0.05, †p < .10. BD = Bipolar participants; CTL = Non-clinical control participants; Mean values are displayed with standard deviations in parentheses where applicable. In Study 2, education was measured using degree completion, rather than number of years: 1 (less than seventh grade), 2 (junior high school, 9th grade), 3 (partial high school, 11th or 12th grade), 4 (high school graduate), 5 (partial college or specialized training), 6 (standard college or university graduate), and 7 (graduate professional training, graduate degree); In Study 2, income was represented as 1 (*<$10,000*), 2 (*$10,000-20,000*), 3 (*$20,000-30,000*), 4 (*$30,000-40,000*), 5 (*$40,000-50,000*), 6 (*$50,000-70,000*), 7 (*$70,000-100,000*), and 8 (*>$100,000*). In Study 3, income was represented as 1 (*<$10,000*), 2 (*$10,000-25,000*), 3 (*$26,000-50,000*), 4 (*$51,000-75,000*), 5 (*$76,000-100,000*), and 6 (*>$100,000*).