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An integrative study of motivation and goal regulation processes in subclinical anxiety, depression and hypomania

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ABSTRACT

Research has implicated motivation and goal regulation in susceptibility to mood disorders. We studied for the first time key facets of motivation and goal regulation concurrently in relation to affective symptoms. The cross-national sample comprised 510 university students from the United States (n = 279) and United Kingdom (n = 231). Participants completed self-report measures of motivation, conditional goal setting, urgency, depression, anxiety, and mania risk. Structural Equation Modeling results found that behavioral activation system scores correlated negatively with depression and positively with mania risk, but were unrelated to anxiety. High conditional goal setting correlated uniquely with higher depression but not to anxiety or mania risk. Urgency correlated with higher anxiety, depression, and mania risk. Behavioral inhibition system scores correlated negatively with mania risk but unexpectedly did not correlate with anxiety in the multivariate model. The behavioral activation, behavioral inhibition, conditional goal setting, and urgency results showed shared and distinct patterns of relationships with depression, anxiety and mania risk. Our findings indicate unique and common risk vulnerabilities in depressive, anxious, and manic syndromes and extend an integrative knowledge of these syndromes in relation to goal regulation.

1. Introduction

Successful goal pursuit has been positively associated with subjective well-being (Brunstein, 1993; Emmons, 1996; Sheldon and Houser-Marko, 2001), and even goal striving itself is thought to promote psychological well-being (Sheldon et al., 2002). Personal goals are defined as motivational representations of desired end states that guide sustained activity (Dickson et al., 2011, 2016) and are fundamental to human experience (Klinger, 1977). Successful goal attainment often depends on sustained commitment and effort to overcome obstacles, as well as setting achievable goals.

Several researchers have considered how psychopathology relates to goal setting and pursuit. Findings across multiple studies have indicated that goal dysregulation is apparent across several affective disorders, such as depression, anxiety, and hypomania (e.g., Dickson and Moberly, 2013b; Johnson et al., 2010; Winch et al., 2015). This work, though, suggests that there are multiple processes involved in goal setting and pursuit that may be impaired, but these processes have been typically studied separately. Here, we investigated multiple goal setting processes concurrently to determine whether shared and distinct processes characterize depressive, anxious and hypomanic syndromes.

We begin our discussion of goal dysregulation by considering motivation, which is the first step in setting and mobilizing towards goals. Problems with motivational systems are implicated in the vulnerability to mood disorders (Cloninger, 1987; Davidson et al., 2002; Gray, 1982). Decades ago, Gray (1982) proposed two neurobiologically-based motivation systems: the behavioral activation system and behavioral inhibition system. According to this conceptualization, the behavioral activation system guides sensitivity to cues of reward, and thereby gives rise to sadness, happiness, and anger, depending on goal progress or thwarting (Carver and Harmon-Jones, 2009). In contrast, the behavioral inhibition system guides sensitivity to threat stimuli and thereby gives rise to fear and anxiety when threats are impending, or calmness and relief upon escape from threats. In a model of psychopathology, Fowles (1994) posited that depression and anxiety are characterized by high activity of the behavioral inhibition system, depression by low

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levels of behavioral activation, and mania by high behavioral activation. Within this model, mania was thought to be unrelated to behavioral inhibition, and anxiety to be unrelated to behavioral activation levels. These specific associations have since been supported by research using self-report and psychophysiological measures of behavioral activation and inhibition (Brown, 2007; Johnson et al., 2003, 2012; Kasch et al., 2002; see Johnson et al., 2012 for review).

Behavioral activation and inhibition sensitivity appears to guide the types of goals that a person sets (e.g., approach-oriented and avoidance-oriented goals), as well as responsivity to perceived progress or failure in goal pursuit (Carver and Scheier, 1990). Once goals are set, however, there is less empirical evidence that informs our understanding of the actual processes which are likely to guide successfully managing goal pursuit. At the broadest level, inflexible goal processes (Carver and Scheier, 1990, 1998; Mansell, 2005; Watkins, 2011), and overly emotional, impulsive responses to goal progress or failure (Berg et al., 2015) have been found to be associated with psychological difficulties. Accordingly, we consider two psychological processes that might interfere with successful goal pursuit, thereby intensifying risk of psychopathology: Conditional goal setting and urgency. Conditional goal setting is the tendency to view high order goal attainment, such as life satisfaction, fulfillment, and self-worth, as entirely dependent on the achievement of lower order goals (Hadley and MacLeod, 2010; McIntosh, 1996), a process that has been called goal linking. Urgency is defined as the tendency to respond to heightened emotion states with impulsive, rash action or speech that is often later regretted (Whiteside and Lynam, 2001), a form of impulsivity that has been consistently shown to be statistically distinct from other forms of impulsivity (Sharma et al., 2014). Conditional goal setting sets the stage for a rigid inflexibility in the pursuit of goals and assessment of progress, whereas urgency could guide impulsive responses to goal progress or failure.

Several conceptual models help provide a rationale for the study of overly rigid goal pursuit. Pyszczynski and Greenberg's (1987) self-regulation perseveration theory purports that continued pursuit of an unattainable goal creates a downward cycle of excessive self-focus, negative affect and depression. It is argued that the most adaptive response in the face of an unattainable goal is to disengage (Carver and Scheier, 1990, 1998; Wallace et al., 2012). Conditional goal setting may provide one possible explanation why people continue to engage in problematic goal pursuits, even when failing to achieve their goals. Relevant to conditional goal setting, goals can be viewed within a hierarchy which varies from higher order, abstract goals such as the pursuit of happiness, well-being, and self-esteem, to lower order goals, such as eating a healthy meal or expressing oneself well during a work meeting (Carver and Scheier, 1998; McIntosh, 1996). Persons with high levels of conditional goal setting would be more prone to believing that personal well-being is dependent on accomplishing smaller goals (Street, 2002), with beliefs such as, “I can only be happy if I achieve this goal.”

Consistent with theory, there is some evidence to suggest that higher conditional goal setting is relevant across psychopathologies. Conditional goal-setting tendencies are correlated with depression (Street, 1999), rumination (Street, 1999), and hopelessness among depressed persons (Hadley and MacLeod, 2010), and deliberate self-harm (Danchin et al., 2010); thus, consistent with the idea that people will continue to pursue unattainable goals, causing increases in emotional pain. Conditional goal setting is also a significant predictor of eating disorder symptoms (Lethbridge et al., 2011). Consistent with the view that goals are central to self-worth, several studies suggest that those with a history of mania endorse feeling as though they can only have self-worth if they attain their goals (Johnson, et al., 2012). Anxiety has also been tied to over-investment in the importance of achieving goals (Pomerantz et al., 2000), and to a sense of shame and guilt associated with not achieving valued goals (Dickson and Moberly, 2013a). Although emerging research provides some evidence that conditional goal setting is implicated in psychopathologies, no research has yet investigated this process from an integrative perspective.

Beyond conditional goal-setting, urgency may also interfere with the effective and planned pursuit of goals. This interference with achieving valued goals could induce aversive emotional states that could spiral into depression and/or anxiety. A burgeoning body of research suggests that urgency shows robustly larger links with internalizing and externalizing psychopathologies than do other forms of impulsivity, including depression, anxiety, and manic symptoms (Berg et al., 2015; Cyders and Smith, 2008; Muhtadie et al., 2014).

In sum, considerable theory and research suggests that psychopathology can be related to individual differences in behavioral activation and inhibition systems, which guide goal setting and pursuit. There is also evidence that psychopathology is related to less flexible conditional goal setting and to heightened urgency levels. These psychological difficulties would seem to have major repercussions for the ability to effectively pursue goals, and to sustain emotion regulation in the face of perceived goal progress and failure. Despite the clear links across these processes, researchers have tended to study motivation, conditional goal setting, and urgency separately. Our goal is to consider these processes conjointly in an integrative approach considering common and distinct facets of depressive, anxious and manic syndromes.

Just as behavioral activation, behavioral inhibition, conditional goal setting and urgency are conceptually related and so expected to be inter-correlated, the affective syndromes of anxiety, depression, and mania are highly comorbid (e.g., individuals who struggle with depression are also more likely to experience anxiety and mania; Alloy et al., 1990; O’Garro-Moore et al., 2015). A clearer picture of the specific associations between these motivational constructs and symptoms is therefore obtained by accounting for their overlap and parallel associations. Within the present study we therefore model the hypothesized associations between these constructs simultaneously, as a means of better clarifying the shared and unique relationships between them.

The present study investigated these hypothesized associations using a young adult sample. The rate of serious mental health issues is most prevalent among young adults aged 18–25 years (Perlick et al., 2010). Higher education often presents several significant stressors for young adults as they cope with the emotional demands of transition and relocation from home to university, forming intimate relationships, financial pressures and academic assessments. The early onset of mental health difficulties in young adulthood is also associated with more severe, persistent, recurrent and lifelong forms of mental health problems (Zarate, 2010).

We also consider psychopathology using continuous, dimensional indices, as taxometric analyses have provided evidence for the dimensional nature of many mental health difficulties, such as depression and anxiety (Kertz et al., 2014; Ruscio and Ruscio, 2000). Such findings suggest these problems exist on a continuum between the general and clinical populations. This continuity suggests there is a value in exploring psychological mechanisms involved in these difficulties at both lower (i.e., non-clinical samples) as well as higher ends of this continuum. Here, we focused on symptoms rated on a continuum of severity which represent risk factors in the development of more severe and enduring psychological conditions.

2. Method

2.1. Participants and procedure

Ethics board approval for the research was gained from the two participating universities before data collection began. Five hundred and forty-five students from a university in the UK (n = 250) and a university in USA (n = 295) volunteered to participate in the study. After informed consent was obtained, participants completed self-report measures online. The questionnaire included two “catch” items designed to identify careless responders (e.g., “Choose 4 as your response

Table 1
Demographic characteristics of the sample.

Characteristic	UK University (n = 231)	US University (n = 279)
Age M (SD)	21.38 (4.61) (n = 228)	20.16 (2.03) (n = 279)
Gender		
Women	67.1% (n = 155)	70.6% (n = 197)
Men	32.9% (n = 76)	29.4% (n = 82)
Ethnicity		
White/Caucasian	81.8% (n = 189)	25.5% (n = 71)
Asian	10.8% (n = 25)	53.2% (n = 148)
Hispanic/Latino	0.9% (n = 2)	6.1% (n = 17)
Black/African	1.3% (n = 3)	2.5% (n = 7)
Indian Subcontinent	1.3% (n = 3)	7.2% (n = 20)
Middle Eastern	0.4% (n = 1)	1.4% (n = 4)
Mixed Ethnic	2.6% (n = 6)	3.2% (n = 9)
Other	0.9% (n = 2)	0.7% (n = 2)

to this item"; Godhino et al., 2015). Those individuals (N = 35) who responded incorrectly to these questions were excluded from the sample, resulting N = 510 respondents used for analysis (UK n = 231, US n = 279).

Table 1 presents the demographic characteristics of the two cohorts. The US and UK samples did not differ in gender ($\chi^2(1, N = 510) = 0.73$, $p = 0.39$). However, the UK cohort was significantly older (M = 21.38 years, SD = 4.61) than the US cohort (M = 20.16 years, SD = 2.03) ($t(505) = 3.99$, $p < 0.001$).

2.2. Measures

2.2.1. Mood and anxiety symptoms questionnaire – short form (Watson et al., 1995a and 1995b)

This questionnaire was developed to differentiate symptoms specific to anxiety and depression from those that are common to both syndromes, such as insomnia, irritability, and poor concentration. The Anxious arousal subscale consists of 17 items to assess symptoms hypothesized to be specific to anxiety such as somatic tension and hyperarousal (e.g., "hands were shaky"). The Anhedonic depression subscale consists of 22 items to assess symptoms hypothesized to be specific to depression including anhedonia (e.g., "felt withdrawn from other people") and positive affect (or lack thereof; e.g., "felt optimistic"). Participants rate their level of agreement with each statement in the past week on a 5-point scale. Fourteen items of the Anhedonic depression subscale were reverse-scored prior to calculating subscale totals. Total scores for the subscales are 85 for Anxious arousal, and110 for Anhedonic depression. The questionnaire has good reliability and validity (Watson et al., 1995a, 1995b). Internal consistency of the subscales in this study were: Anxious arousal, α = 0.91 and Anhedonic depression, α = 0.91.

2.2.2. 7 up 7 down (Youngstrom et al., 2013)

This measure comprises two 7-item subscales to assess lifetime propensities toward depressive (e.g., "Have there been times of several days or more when you were so sad that it was quite painful or you felt that you couldn't stand it?") and hypomanic symptoms (e.g., "Have you had periods of extreme happiness and high energy lasting several days or more when what you saw, heard, smelled, tasted or touched seemed vivid or intense?"). Participants rate each item on a 4-point scale. Possible subscale scores range from 0 to 21. The measure has demonstrated good reliability and validity (Youngstrom et al., 2013). In the present study, internal consistency was strong, 7-Down subscale α = 0.93 and 7-Up subscale α = 0.83.

2.2.3. Conditional goal setting (Hadley and MacLeod, 2010)

This measure was designed to assess conditional goal setting, defined as the extent to which a person considers personal happiness, fulfillment and self-worth to depend on the attainment of lower-order goals. Participants select one of two respective statements (i.e., "I can only feel happy/fulfilled/have sense of worth if I achieve my goals" versus "Even if I do not achieve my goals I can still feel happy/fulfilled/have a sense of worth"). They then rate how strongly they agree with the selected statement for each of the three items (happiness, fulfillment, sense of worth) on a 4-point scale (from slightly to very strongly). Scores for happiness, fulfillment, and self-worth were calculated based on the following scoring scheme: selecting "Even if I do not achieve my goals I can still [be happy/feel fulfilled/have a sense of worth]" would be scored as 1 point if they endorsed very strongly and 4 points if they endorsed slightly, whilst selecting each statement for, "I can only feel [happy/fulfilled/have a sense of worth] if I achieve my goals" would be scored as 5 points if they endorsed slightly and 8 if they endorsed very strongly. Thus, the score for each of the 3 items could range from 1 (low Conditional goal-setting) to 8 (high Conditional goal setting), which were summed to produce a total score (range 3–24). The Conditional goal setting measure has shown good face validity and convergent and discriminant validity (Crane et al., 2010; Hadley and MacLeod, 2010).

2.2.4. Behavioral inhibition system/behavioral activation system scales (Carver and White, 1994)

This 20-item measure was designed to assess sensitivity to reward (Behavioral activation) and threat (Behavioral inhibition). The Behavioral activation items have three factor analytically supported subscales. Although initial factor analyses indicated one suggested Behavioral inhibition subscale (Carver and White, 1994), recent research, based on factor analysis, has suggested two subscales, a fear subscale and an anxiety subscale (Dissabandara et al., 2012; Poythress et al., 2008a, 2008b). Within this paper we have worked under the assumption of a single over-arching Behavioral inhibition construct, but by including both subscales as separate indicators in the model we had the opportunity to identify and accommodate any differential patterns of correlations relating to these two subscales. The Behavioral inhibition - Fear subscale includes three items to assess fear sensitivity (e.g., "I have very few fears compared to my friends"; range 3–12) and the Anxiety subscale includes four items to assess anxiety sensitivity (e.g., "I worry about making mistakes"; range 4–16). The Behavioral activation subscales include Reward responsiveness (5 items; e.g., "When I get something I want, I feel excited and energized"; range 5–20), Drive (4 items; e.g., "When I want something, I usually go all-out to get it"; range 4–16), and Fun Seeking (4 items; e.g., "I crave excitement and new sensations"; range 4–16). Participants rate each statement on a scale ranging from 1 ("Very true of me") to 4 ("Very false of me"). Except for two items, all items are reverse-scored. The Behavioral inhibition and Behavioral activation system scales have shown good reliability, and have been validated against behavioral, neural, and genetic measures of approach and avoidance motivation (Brown, 2007; Carver and White, 1994; Germans and Kring, 2000; Johnson et al., 2016; Knutson and Greer, 2008). Internal reliabilities for the subscales were: Fear α = 0.60, Anxiety α = 0.70, Drive α = 0.77, Fun-seeking α = 0.70, and Reward responsiveness α = 0.69.

2.2.5. UPPS impulsive behavior scale – urgency subscale (Whiteside and Lynam, 2001)

The Urgency subscale comprises 12 items covering impulsive responses to emotional states (e.g., "When I feel rejected, I will often say things that I later regret"). Participants rate how much they agree with each item statement on a scale ranging from 1 ("agree strongly") to 4 ("disagree strongly"). Except for one item, all items are reverse scored. Possible scores range from 12 to 48, with higher scores indicating greater impulsivity. Support for the reliability and validity, including factor structure and robust correlations with psychopathology, aggression, and suicidality has been found (Berg et al., 2015; Magid and Colder, 2007; Miller et al., 2003; Whiteside and Lynam, 2001). For SEM analyses, Urgency items were aggregated into three separate item

parcels (see below), via the correlational method (Little et al., 2013), with good reliability per parcel, α = 0.75–0.79.

2.3. Statistical analyses

As expected, several of the psychopathology variables were skewed, with relatively few high scores observed. Robust Maximum Likelihood estimation was therefore adopted, which corrects for non-normality in the observed variables (Satorra and Bentler, 1994; Yuan and Bentler, 2000). Analyses were completed using Mplus 7 (Muthén and Muthén, 1998–, 2012). Good model fit was determined via a range of fit indices (Jackson et al., 2009), including a non-significant chi-square statistic, a root-mean-square error of approximation (RMSEA; Steiger, 1990) and standardized root-mean-square residual (SRMR) < 0.05 (or < 0.08 for adequate fit; Bentler, 1990; Hu and Bentler, 1999; Jöreskog and Sörbom, 1993), a comparative fit index (CFI; Bentler, 1990) and the Tucker-Lewis Index (TLI; Tucker and Lewis, 1973) > 0.95 (or > 0.90 for adequate fit; Bentler, 1990; Hu and Bentler, 1999).

Initially, a measurement model (Model 1) was estimated for the goal regulation constructs, with conditional goal setting, behavioral activation, behavioral inhibition, and urgency as latent variables with subscales or item parcels in the case of urgency, acting as indicators (three indicators for conditional goal setting, behavioral activation and urgency, two for behavioral inhibition). Urgency was estimated using item parcels rather than individual items as indicators due to the improved statistical properties of the parcels (e.g., continuous vs. ordinal measurement). As our focus was on the relationships between constructs rather than item-level relationships, and since prior work supports the unidimensionality of negative urgency, this approach was deemed appropriate (Little et al., 2002, 2013). All motivational constructs (conditional goal setting, behavioral activation, behavioral inhibition, urgency) were allowed to inter-correlate. In the second step of the analysis (Model 2), the three outcome variables (depression, anxiety, mania) were included, and hypothesized relationships were estimated for each motivational construct with each outcome variable (non-hypothesized paths were fixed to zero). In a third model (Model 3) we allowed all motivational constructs to be associated with all three outcomes. By comparing this Model to the more parsimonious Model 2, we were able to further test the idea of specificity in the relationships between motivational constructs and outcomes. This model comparison was made using the scaled Chi-squared difference test (the scaled version is required due to the robust estimation method; Byrant and Satorra, 2012), and the corrected Akaike Information Criterion (AIC_c). The correction to the AIC is recommended where the sample size to parameter ratio is < 40, as in this instance (Burnham and Anderson, 2004). A nonsignificant result of the scaled Chi-squared difference test favors the more parsimonious model. The model with smaller AIC_c values, indicating lower information loss, is also favored. Here a negative value indicates a smaller value for the more parsimonious model. Augmented component-plus-residual plots (Mallows, 1986) between predictors and outcomes did not suggest any substantive non-linearity, indicating that a linear model was appropriate.

3. Results

To check for careless responders, within-participant variance for responses across the questionnaire items for scales used in the study was calculated. There was a single case with a particularly low level of variance across several scales (< −3 *SD* from mean), which might indicate careless responding. However, sensitivity analyses, re-running analyses with this case excluded, suggested it made little difference to the results. Results are therefore given for the full dataset only. Correlations and descriptive statistics for study variables are reported in Table 2.

Seventeen percent (n = 85) of the sample met clinical caseness for depression based on the Mood and anxiety symptoms questionnaire (sensitivity = 85%, specificity = 65%; Buckby et al., 2007). The anxiety subscale has been shown to have poorer properties in predicting clinical caseness (Buckby et al., 2007). Nonetheless, 34% of the sample (n = 174) fell within a clinical range based upon a sample with comorbid mood and anxiety disorder, defined as one SD from the mean anxiety score (40.94 ± 27.68; Buckby et al., 2007). Similarly, 61% (n = 312) of the sample fell within a clinical range based on a bipolar disorder sample (7.31 ± 4.00; Youngstrom et al., 2013). Thus, whilst a non-clinical sample, a substantive proportion were likely experiencing clinically meaningful levels of symptoms.

3.1. Measurement model

The initial measurement model failed to converge, due to a negative residual variance for Reward responsiveness. Consistent with previous research, the Behavioral activation, Reward responsiveness and Behavioral inhibition - Anxiety scales tended to be positively correlated, perhaps related to a more general tendency toward emotional reactivity or goal engagement (Carver and White, 1994; Poythress et al., 2008a, 2008b). We observed negative correlations of the Behavioral activation, Fun-seeking and Drive subscales with the Behavioral inhibition, Fear subscales (see Table 2). When the measurement model was revised so that the residual associated with Behavioral activation, Reward responsiveness was allowed to co-vary with the Behavior inhibition factor, the measurement model (Model 1) showed an adequate fit with the data, X^2 (37) = 94.09, p < 0.01, RMSEA = 0.06 (0.04, 07), CFI = 0.96, TLI = 0.94, SRMR = 0.04. Standardized factor loadings ranged from 0.52 to 0.94, suggesting good loading of indicators onto latent variables (Costello and Osborne, 2005).

3.2. Test of hypothesized model

Model 2 added the three outcomes (depression, anxiety, mania) and the hypothesized paths between these and the motivational constructs (See Fig. 1). This model fit the data well, X^2 (63) = 151.18, RMSEA = 0.05 (0.04, 0.06), CFI = 0.95, TLI = 0.93, SRMR = 0.04. Standardized and unstandardized parameter estimates are reported in Fig. 1. All hypothesized paths were significant (p < 0.05) with the exception of the relationship between Behavioral inhibition and anxiety. As a further test of this model we compared it with a model where all motivational variables were associated with all three outcomes (Model 3), X^2 (58) = 139.48, RMSEA = 0.05 (0.04, 0.06), CFI = 0.95, TLI = 0.93, SRMR = 0.04. A comparison of the two models demonstrated that Model 3 made a marginal significant improvement over Model 2, *scaled*-ΔX^2 (5) = 11.74, p = 0.04, ΔAICc = 0.45. This improvement could be attributed to an additional, significant association between urgency and hypomania. Inspection of log-likelihood distances identified three outliers for Model 3. Excluding these cases made no substantive difference to results.

Model 3 was revised to co-vary for the effects of sample (UK, USA), gender and age upon the outcome variables (Model 4). The model parameters are presented in Fig. 2. There was minimal change on the relationships between motivational constructs and outcomes. The covariates were not significantly related to any outcomes, with the exception of gender, whereby females had lower scores for mania risk, β = −0.12. Fit was marginally poorer in this model, likely due to the addition of several non-significant parameters, X^2 (85) = 176.67, RMSEA = 0.05 (0.04, 0.06), CFI = 0.95, TLI = 0.91, SRMR = 0.04.

4. Discussion

The current study provides the first integrative examination of multiple facets of goal regulation across depression, anxiety, and manic symptoms. Bivariate correlations were consistent with previous literature. Behavioral activation scores were related to lower depression and higher mania risk scores, but were unrelated to anxiety. Behavioral

Table 2
Descriptive statistics and correlations between study variables.

Variable	Mean	SD	2	3	4	5	6	7	8	9	10	11	12
1. Anxiety (MASQ AA)	27.12	10.48	0.30*	0.29*	0.03	0.09*	−0.02	0.20*	0.11*	0.08	0.08	0.06	0.36*
2. Depression (MASQ AD)	61.12	14.77		−0.13*	−0.22*	−0.19*	−0.23*	0.20*	0.20*	0.13*	0.10*	0.11*	0.30*
3. Mania (7U7D)	5.43	4.09			0.28*	0.26*	0.19*	−0.07	−0.19*	0.14*	0.06	0.04	0.15*
4. BAS Drive	10.85	2.33				0.38*	0.42*	0.01	−0.11*	0.13*	0.09*	0.06	0.10*
5. BAS Fun-seeking	11.64	2.35					0.39*	0.00	−0.18	0.04	0.01	0.01	0.19*
6. BAS Reward	16.91	2.17						0.38*	0.18*	0.10*	0.07	0.13*	0.12*
7. BIS Anxiety	13.26	2.20							0.55*	0.08	0.12*	0.11*	0.24*
8. BIS Fear	8.76	1.88								0.05	0.10*	0.09*	0.26*
9. CGS Happiness	3.92	1.88									0.30*	0.29*	0.14*
10. CGS Fulfillment	4.64	1.96										0.34*	0.03
11. CGS Self-worth	4.36	1.87											0.09*
12. Urgency	28.97	7.09											–

SD = standard deviation, MASQ = Mood and Anxiety Symptoms Questionnaire, AA = Anxious Arousal, AD, Anhedonic Depression, 7U7D = 7-Up 7-Down, BAS = Behavioral Activation System, BIS = Behavioral Inhibition System, CGS = Conditional Goal Setting.
* $p < 0.05$.

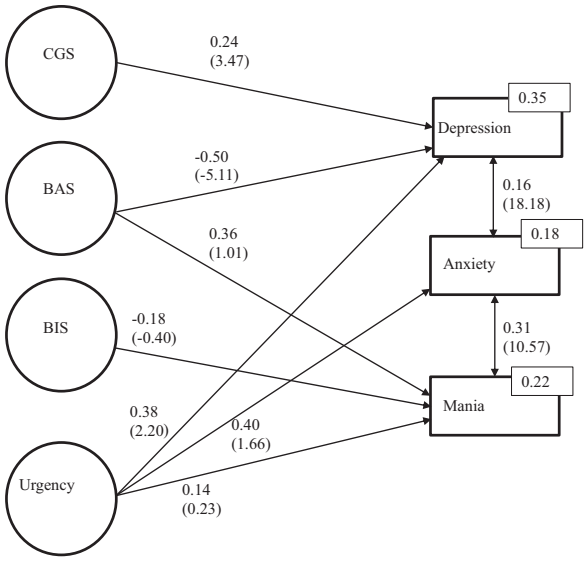

Fig. 1. Structural model (Model 3) with standardized and unstandardized (in parentheses) parameters reported. Multiple Squared Correlations reported in box in the corner of the outcome variables. Only significant paths are displayed ($p < 0.05$). Non-significant paths are reported in Supplement 1.0.

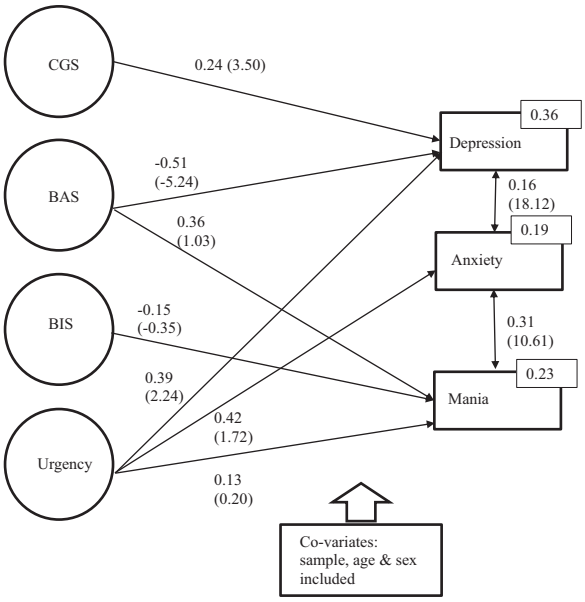

Fig. 2. Structural model (Model 4) adjusting for sample, age and sex, with standardized and unstandardized (in parentheses) parameters reported. Multiple Squared Correlations reported in box in the corner of the outcome variables. Only significant paths are displayed ($p < 0.05$). Non-significant paths are reported in Supplement I.

inhibition scores were related negatively to mania risk and positively to anxiety. Higher conditional goal setting scores correlated modestly with depression but not with anxiety or mania risk. Urgency scores were related to anxiety, depression, and manic symptoms. Nonetheless, a core goal of this study was to examine a multivariate model. Multivariate effects, which took into account the inter-relationships among variables, identified shared and distinct goal regulation features in depression, anxiety and mania syndromes. Urgency was related to higher depression, anxiety, and mania risk, behavioral activation was related to lower depression and higher mania risk (but not anxiety), and conditional goal-setting was related to higher depression (but not anxiety or mania risk). Although these patterns generally fit hypotheses, once other facets of goal regulation were accounted for, behavior inhibition was related only to mania, but not anxiety as might be expected. Taken together, the findings illustrate the importance of considering the overlap among these constructs, and for integrating models of goal setting and emotion-relevant impulsivity in understanding goal dysregulation.

Before considering implications, it is important to consider limitations of this study. The focus of investigation was confined to the study of subclinical symptoms. We did not use diagnostic interviews, and we included no indices of functional impairment. Although the current study is focused on mild variations in psychopathology, it is important to note that our findings are consistent with those observed in clinically diagnosed samples (Alloy et al., 2012; Carver et al., 2013; Shankman et al., 2013), and recent studies document that rates of psychopathology among current college students are equivalent to those in the general population (Ibrahim et al., 2013a, 2013b). A related issue is our reliance on self-ratings of goal regulation. Common method variance may have inflated the size of effects observed. Moreover, the cross-sectional design precludes our ability to comment on whether goal regulation is increasing the risk for symptoms, or symptoms are increasing the risk of goal dysregulation. Future research is needed using multimodal measures of psychopathology and goal regulation in a clinical sample, with a longitudinal design.

Despite limitations, these findings do provide support for the goal regulation model as important across psychopathologies, and for the inclusion of goal-setting processes and emotion-relevant impulsivity in such goal dysregulation models. One of the more surprising findings was that behavior inhibition was not relevant to heightened anxiety once urgency and conditional goal setting were accounted for. Although substantial research has tied behavior inhibition to anxiety (e.g., Brown, 2007), and we observed this pattern in bivariate relationships,

the fuller model suggests that a tendency to respond with impulsive shifts in behavior and motivation in the face of negative stimuli may be more important than the degree of simple emotional sensitivity to those stimuli.

If findings generalize to clinical samples, the current results provide more support for using dysregulated motivation, goal setting and urgency as treatment targets. Those who are mania-prone may benefit from learning skills to address high approach motivation, as has been suggested in some cognitive behavioral treatment approaches (Johnson and Fulford, 2009; Lam et al., 2010). For those prone to depression, deficits in approach motivation might be addressed through highly structured approaches to tackling goals, such as that provided by behavioral activation. High conditional goal setting uniquely characterized depression but not anxiety or hypomania. The tendency of those vulnerable to depression to engage in highly conditional, inflexible goal setting suggests it would be beneficial to learn strategies to effectively disengage from unachievable goals whilst engaging in new goals. One part of this may be tied to a tendency to be overly self-critical of failure (Ehret et al., 2015) which may interfere with abandoning hopeless goals. One such strategy may be to help people understand their motives and the perceived consequences of pursuing goals that do not appear achievable (Danchin et al., 2010).

Finally, urgency was the only variable that showed transdiagnostic effects across three syndromes in the full model. Urgency may disrupt effective goal pursuit, leading to rash and unhelpful actions, which could engender anxiety, depression and hypomania as a consequence. However, it is also plausible that depression, anxiety and hypomania lead to a person becoming more impulsive in this way, as more stable goal pursuit becomes difficult to maintain, or emotion states interfere with effective cognitive control. Regardless, transdiagnostic interventions could involve techniques to reduce rapid responding to emotion, such as those employed in dialectical behavior therapy (Linehan, 1993).

The importance of urgency across disorders also highlights the need for better understanding of how this form of impulsivity could lead to such divergent symptom outcomes (Carver et al., 2009). Recent research has differentiated that impulsive responses to emotion might differ in form, with one type of response involving a pervasive influence of emotion on cognitions and disengagement in the face of negative emotions, and a very different form involving the rapid expression of emotions in regrettable speech and behavior (Carver et al., 2011). There is some evidence that the former is of particular relevance for depression, anxiety, and suicidal ideation, whereas the latter is more relevant for conditions involving impulsive actions, such as mania, externalizing conditions, and suicidal action (Auerbach et al., 2017; Johnson et al., 2013). Better differentiation of these processes may help refine treatment targets among those struggling with negative emotions versus regrettable emotion-driven actions.

The current findings provide a base for ongoing integrative, transdiagnostic research. We believe that such work has important potential for refining treatment models and awaits further investigation with clinical populations.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.psychres.2017.06.002.

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