BRIEF REPORT

Motivation and goal orientation in vulnerability to depression

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Depression may be related to motivational systems that govern approach and avoidance behaviour such as temperament and goal orientation. Using a remitted depression design we found that previously depressed and never-depressed individuals did not differ on number of approach goals generated, degree of goal commitment or extent of planning to reach goals. However, previously depressed individuals generated more avoidance goals indicating that the tendency to set avoidance goals may be a trait-like vulnerability to depression. Previously depressed individuals also reported higher activation of the behavioural approach system (BAS) raising the possibility that this system is energising approach behaviour in the service of avoiding aversive consequences.

Keywords: BIS/BAS; Depression; Goals; Motivation; Temperament; Vulnerability.

In recent years there has been growing interest in motivational systems that may underlie the development, progression, and recurrence of depression (Dickson & MacLeod, 2004a, 2004b; Elliot & Thrash, 2002; Shankman, Klein, Tenke, & Bruder, 2007). One way that depression can present itself is through behaviour such as withdrawal and low engagement in pleasant activities, sensitivity to aversive experiences, and pursuit of goals in the service of avoiding aversive experiences. It is possible that these behaviours are related to imbalances in motivational systems. Motivation can be defined as the energising force that directs behaviour and can be divided into approach

motivation, which is directed by the possibility of reward, and avoidance motivation which is directed by the possibility of undesired outcomes (Thrash & Elliot, 2002).

According to Gray and McNaughton (2000), the behavioural approach system (BAS) mediates reaction to appetitive stimuli and is responsible for reducing the temporal spatial distance between the current appetitive goal state and the final biological reinforcer. In contrast, the behavioural inhibition system (BIS) is responsible for the resolution of goal conflict by inhibiting behaviour, initiating risk assessment and cautiousness. Within this framework, high-BAS individuals are

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thought to be sensitive to reward and increase approach-motivated behaviours in an effort to experience rewarding events. In contrast, high-BIS individuals are sensitive to loss of expected reward and novelty, which increases avoidance behaviours to prevent undesirable events. Fowles (1994) proposed that depression results from an overactive BIS and an under active BAS. This "joint subsystems hypothesis" suggests that the BAS and BIS have interactive effects and antagonise one another (Corr, 2002), whereas the "separable subsystems hypothesis" views the BAS and BIS as having independent effects. The data supporting either hypothesis are equivocal.

Kasch, Rottenberg, Arnow, and Gotlib (2002) found that clinically depressed individuals reported lower BAS and higher BIS relative to controls. Furthermore, lower BAS was associated with worse 8-month outcomes, whereas the BIS was not associated with depression course (see also McFarland, Shankman, Tenke, Bruder, & Klein, 2006). Pinto-Meza et al. (2006) found that individuals with current major depressive disorder (MDD) showed an overactive BIS and an under active BAS relative to individuals with no depression history. Of particular interest, individuals who had recovered from MDD showed BIS activity similar to never-depressed individuals but continued to exhibit an under active BAS even when controlling for depressive symptoms. This finding suggests that trait vulnerability to MDD might involve an under active BAS. Similarly, Shankman et al. (2007) found that early onset depression is associated with a deficit in the approach motivation system, whereas there was no association with the avoidance motivation system. Together, these studies support the argument that vulnerability to depression is characterised by low approach motivation.

Goal setting is another aspect of motivation implicated in vulnerability to depression. Indeed, biological models of temperament posit that an essential component of determining observable behaviour is the nature of the goal held in mind (Gray & McNaughton, 2000). Elliot and Thrash (2002) conceptualised temperament as networks of biological sensitivities that instigate valenced (i.e., approach, avoidance) dispositions to enact certain behaviours, whereas goals are short-term cognitive forms of self-regulation that give focus to and direct behaviour. Like temperament, goals can be categorised into those involving approach versus avoidance. Approach goals involve trying to obtain a desirable outcome, whereas avoidance goals involve trying to avert an undesirable outcome (Dickson & MacLeod, 2004a, 2004b). Therefore, BIS/BAS can be conceptualised as a temperamental predisposition and goal orientation (approach avoidance) can be conceptualised as a cognitive mechanism by which biological tendencies translate to actual behaviour (Elliot & Thrash, 2002).

In two studies Dickson and MacLeod (2004a, 2004b) found that individuals with elevated depressive symptoms generated fewer approach goals compared to those with low levels of symptoms, while a third study found that dysphoric adolescents generated fewer approach goals and more avoidance goals (Dickson & MacLeod, 2006). Similarly, other studies have found that individuals who generate more avoidance goals relative to approach goals report less subjective well-being (Elliot, Sheldon, & Church, 1997). Emmons (1986) attributed this negative relationship between avoidance goals and subjective well-being in part to a highly sensitive BIS that may predispose individuals to be preoccupied with avoiding aversive outcomes. It is therefore plausible that depression-prone individuals have an overactive BIS and under active BAS, which predisposes them to generate more avoidance goals and fewer approach goals. It may be the case that generating more avoidance goals and fewer approach goals would place these individuals at risk for fewer positive experiences and lower reinforcement, which in turn may fuel depression (Lewinsohn, Sullivan & Grosscup, 1980).

Goal theorists posit that goal commitment and implementation intentions are vital components to accomplishing goal-directed behaviour (Heckhausen & Gollwitzer, 1987). Goal commitment is an individual's determination to reach a goal and has been defined as the degree to which an individual commits resources (e.g., time and effort) toward accomplishing a goal (Naylor & Ilgen, 1984). On the other hand, implementation intentions

(i.e., if–then plans) are self-regulatory strategies that specify the when, where, and how of goal-directed responses for successful accomplishment of a goal (Gollwitzer, 1999), and a meta-analysis found that they improve goal attainment (Gollwitzer & Sheeran, 2006). It may be that depression-prone individuals develop weak goal commitment and implementation intentions to their personal goals, which increases vulnerability to depression.

The present study examined the relationship between BIS/BAS sensitivities and goal orientation in vulnerability to depression. This study employed a remitted depression design, which is one approach to explore whether or not these motivational systems represent trait vulnerabilities. By definition previously depressed individuals are depression prone: (1) Each has had a past episode (and therefore has whatever vulnerabilities are associated with the disorder); and (2) as a group, they are prone to high rates of future recurrence (Keller & Boland, 1998). Therefore, if specific motivational systems are trait vulnerabilities to depression they should be more prominent among previously depressed compared to never-depressed individuals. We hypothesised that previously depressed individuals experience an overactive BIS and an underactive BAS, generate more avoidance goals, and generate fewer approach goals relative to never-depressed controls. We tested the joint subsystems hypothesis, which posits that the BIS and BAS have interactive effects that would predict depression diagnostic group. On an exploratory basis, we also examined if previously depressed and never-depressed individuals differed in goal commitment and implementation intentions.

METHODS

Participants

Participants were 83 (36 male) undergraduates enrolled in introductory psychology courses at a large public university in the North-eastern United States. Participants' ages ranged from 18 to 27 years with a mean age of 19.5 years ($SD = 1.9$). The sample largely identified as heterosexual (82 heterosexual, 1 bisexual). The majority identified as Caucasian (51.8%), 20.5% as Asian, 13.5% as African American, 8.4% as bi-racial, and 5.8% as Hispanic. A total of 43 (19 male) met criteria for previous MDD, and 40 (17 male) never met criteria for MDD. Exclusion criteria were current MDD and past history of or current manic or hypomanic episode. Among the participants that met criteria for previous MDD, the mean number of previous episodes of major depression was 2.4 ($SD = 2.3$, Mode = 1). The mean age for the first onset of depression was 15.6.

Measures

The Patient Health Questionnaire-9 (PHQ; current and lifetime: Cannon et al., 2007). The PHQ9 (current and lifetime) was used to screen for current and lifetime MDD (Cannon et al., 2007; Spitzer, Kroenke, & Williams, 1999). The PHQ-9 current is a 10-item self-report measure that assesses current and lifetime episodes of MDD. Diagnoses based on this instrument have been shown to produce good agreement with diagnoses made by mental-health professionals using DSM-IV diagnostic criteria ($\kappa = .65$; sensitivity, 73%; specificity, 94%; Kroenke, Spitzer, & Williams, 2001; Spitzer et al., 1999). MDD is diagnosed if 5 or more of the 9 depressive symptom criteria have been present at least "more than half the days" in the past 2 weeks and either item 1 and or 2 is endorsed reporting "feeling down, depressed, or hopeless" or "little interest or pleasure in doing things". To receive the MDD diagnosis impairment of social, occupational, or other important areas of functioning must be endorsed. The PHQ-9 lifetime is a modified version of the PHQ-9 current used to assess for a previous episode of major depression. Previous research has shown support for the validity of this modified version in studies, comparing it to a lifetime mood disorder diagnosis established by the structured clinical interview for the DSM-IV (Cannon et al., 2007).

The Beck Depression Inventory – II (BDI–II; Beck, Steer, & Brown, 1996). The BDI-II was used to

assess for current depressive symptomatology. The BDI-II is a 21-item self-report questionnaire with high internal consistency ($\alpha = .92$) and good convergent and discriminant validity (Beck et al., 1996). In the present sample, coefficient alpha was .91.

The Mini-International Neuropsychiatric Interview (MINI; Sheehan, Lecrubier, & Sheehan, 1998). The MINI is a brief structured interview designed to assess criteria for the major Axis I psychiatric disorders classified in the DSM-IV (American Psychiatric Association, 2000) and ICD-10 (World Health Organization, 1993). It was developed for the purpose of providing a brief comprehensive highly sensitive screening tool for psychiatric disorders in both clinical and research settings. To assess for MDD, the mood disorder module of the MINI Plus was conducted. The concordance between the MINI-MDD module and the SCID, CIDI, and expert diagnosis has been shown to be good with $\kappa s = .84$, .73 and .68, respectively (Sheehan et al., 1998). The reliability of the MINI-MDD module is also very good with inter-rater $\kappa = 1.00$ and test–retest $\kappa = .87$ (Sheehan et al., 1998).

Reinforcement sensitivity. BIS and BAS activation was measured with the Sensitivity to Punishment (SP) and Sensitivity to Reward (SR) Questionnaire (SPSRQ; Torrubia, Avila, Molto, & Caseras, 2001). The SPSRQ is a self-report questionnaire consisting of 48 yes/no items. The SP scale evaluates individual differences in BIS activation, assessing (1) behavioural inhibition in general situations involving the possibility of aversive consequences or novelty, and (2) worry or cognitive processes produced by the threat of punishment or failure. Items from the SP scale include: "Do you often refrain from doing something because you are afraid of it being illegal?" and "Are you easily discouraged in difficult situations?" The SR scale evaluates individual difference in BAS activation, assessing responses to situations (such as money, sex, social events, power, sensation seeking) in which participants can show reward-oriented behaviour. Items from the SR scale include: "Does the good prospect of obtaining money motivate you strongly to do some things?" and "Do you often take the opportunity to pick up people you find attractive?"

The SP and SR scales have been shown to be orthogonal and demonstrate good internal and test–retest reliability (SP $\alpha = .82$ for females, $\alpha = .83$ for males; SR $\alpha = .75$ for females, $\alpha = .78$ for males; Torrubia et al., 2001). Various studies have found the SP scale to be positively correlated with other BIS-like measures and the SR scale to be positively correlated with BAS-like measures (i.e., Eysenck's Neuroticism and Extraversion and Cloninger's Tridimensional Personality Questionnaire) supporting the SPSRQ's convergent validity (Caseras, Avila, & Torrubia, 2003). In the present sample, coefficient alpha was .84 for SP and .73 for SR.

Goal orientation. We used a modified version of Dickson and MacLeod's (2004a, 2004b) measure of goal orientation. This instrument asks participants to generate personal approach and avoidance goals during a fixed period of time. In this study instructions were modified so that goals were operationalised as experiences that individuals think they typically try to accomplish or try to avoid and that they are currently devoting personal resources towards. The aim of these instructions were to urge participants to elicit present goals versus goals they intend to adopt in the future. Examples were given to indicate that goals can either represent trying to attain something or trying to avoid or do away with something, and can be either broad, e.g., "trying to make others happy", or specific, e.g., "trying to make my family happy" (Emmons, 1986). The prompts for approach and avoidance goals were worded, "It is important for me to . . ." and "It is important for me to avoid . . .". Participants were given 75 seconds to write down as many goals that came to mind within each goal type. Presentation order of approach and avoidance goal types were counterbalanced.

Goal commitment. The Revised HWK Goal Commitment (Klein, Wesson, Hollenbeck, Wright, & DeShon, 2001) 5-item scale was used to measure goal commitment. The responses were on a 5-point Likert scale anchored by *strongly agree/strongly disagree* with the negative items reverse scored (R) such that greater values indicate higher goal commitment. The items were as follows:

1. "It's hard to take this goal seriously" (R);
2. "Quite frankly, I don't care if I achieve this goal or not" (R);
3. "I am strongly committed to pursuing this goal";
4. "It wouldn't take much to make me abandon this goal" (R); and
5. "I think this is a good goal to shoot for".

These ratings were based on each participant's most important approach and avoidance goal. A factor analysis found that the scale is unidimensional and has acceptable internal consistency ($\alpha = .74$; Klein et al., 2001). In the present sample, internal consistency was adequate for avoidance goal commitment ($\alpha = .77$) and good for approach goal commitment ($\alpha = .82$).

Implementation intentions. Implementation intentions were measured with the Spontaneous Implementation Intention scale (Brickell, Chatzisarantis, & Pretty, 2006). This 5-item instrument used a 7-point Likert scale with the anchors "*not at all*" (1) and "*very much*" (7). Ratings were based on each participant's most important approach and avoidance goal. Items included:

1. "I have planned when I am going to . . .";
2. "I have planned where I am going to . . .";
3. "I have planned how I am going to . . .";
4. "I have committed myself to a certain time"; and
5. "I have committed myself to a certain place".

In the present sample, there was good internal consistency for both avoidance implementation intentions ($\alpha = .87$) and approach implementation intentions ($\alpha = .90$).

Procedure

The PHQ-9 (current and lifetime) was administered to the undergraduate introductory psychology subject pool in order to screen for previously and never-depressed individuals. Over 2,666 participants were screened for depression (372 screened positive for past depression; 2,213 screened negative for a lifetime history). Thereafter, participants were contacted to solicit their participation in the study. The first session involved completion of the MINI Plus-Mood Disorder module by a doctoral level clinician. A total of 178 individuals were interviewed: 43 were confirmed to meet criteria for past MDD based on the MINI, while 40 participants were confirmed to have never met criteria for depression. During the second session, scheduled about one week later, participants completed the goal-orientation task, followed by the self-report measures.

RESULTS

Hypotheses were tested with one-way analysis of variance (ANOVA) in R 2.9.1 (R Development Core Team, 2010) with separate analyses for each dependent variable and Depression History (previously depressed vs. never depressed) as the between-subjects factor. Because previously depressed individuals typically report higher current severity of subclinical depressive symptoms compared to never-depressed individuals, conservative follow-up analyses included the BDI as a covariate. The joint subsystems hypothesis was tested using logistic regression to determine if the BIS × BAS interaction predicted depression diagnostic group (*never depressed* = 0, *previously depressed* = 1). Distributions of dependent variables were examined prior to analysis to verify the assumption of normality. Avoidance goals, approach goals, spontaneous implementation intentions for approach goals, and goal commitment for both avoidance and approach goals exhibited significant skew and were

adjusted with Box Cox power transformations, which reduced skew to non-significant levels.

Preliminary analyses

There were no statistically significant differences in mean age, $t(81) = 0.02$, $p = .98$, ethnicity race (Caucasians compared to all other racial groups); $\chi^2(1, N = 83) = 0.96$, $p = .33$, or gender, $\chi^2(1, N = 83) = 0.00$, $p = .95$, across the groups. Therefore, subsequent data analyses were collapsed on these variables. Previously depressed individuals reported more severe current symptoms of depression than never-depressed individuals, $t(78) = 4.99$, $p < .001$, $M = 15.3$ vs. 8.1, on the BDI. As seen in Table 1, preliminary analyses revealed that the SP and the SR scales were orthogonal. Approach goals and avoidance goals were moderately correlated, $r = .51$, $p < .01$, indicating that individuals who generated more approach goals also generated more avoidance goals. Although the SP scale and avoidance goals and the SR scale and approach goals are conceptually linked, they were not significantly correlated in this sample. The BDI was positively correlated with the SP scale, $r = .45$, $p < .01$, but was not significantly associated with the SR scale. Measures of both approach and avoidance goal commitment and spontaneous implementation intentions were positively correlated suggesting that individuals who are more committed to their goals tend to form plans for their goals.

Group differences in avoidance/approach goals

Previously depressed individuals reported a higher number of avoidance goals compared to never-depressed individuals, $F(1, 81) = 6.42$, $p < .01$, $M = 6.0$ vs. 5.0, $\eta^2 = .07$, whereas the group effect was not statistically significant for number of approach goals, $F(1, 81) = 0.00$, $p = .99$, $\eta^2 = 0$. These effects were similar in analyses of covariance (ANCOVAs) controlling for current depressive symptoms: previously depressed individuals reported a marginally higher number of avoidance goals compared to never-depressed individuals, $F(1, 80) = 3.82$, $p = .05$, $\eta^2 = .05$, whereas the group effect was not statistically significant for number of approach goals, $F(1, 80) = 0.31$, $p = .58$, $\eta^2 = 0$.

Group differences in BIS/BAS

Previously depressed individuals reported higher scores on the SP scale, $F(1, 81) = 8.17$, $p < .01$, $M = 13.6$ vs. 10.4, $\eta^2 = .09$, and higher scores on the SR scale, $F(1, 81) = 6.03$, $p < .05$, $M = 15.2$ vs. 13.1, $\eta^2 = .07$, compared to never-depressed individuals. ANCOVAs that included current depressive symptoms as a covariate found that previously depressed individuals reported higher scores on the SR scale, $F(1, 80) = 5.34$, $p < .05$, $\eta^2 = .06$, compared to never-depressed individuals. However, the effect of group was not statistically significant on the SP scale after

Table 1. *Means, standard deviations, and correlation matrix*

	Mean	SD	1	2	3	4	5	6	7	8	9
1. SP	12.0	5.4	1.00	−.04	.11	−.08	.45**	.04	−.15	−.17	−.31**
2. SR	14.2	4.0		1.00	.14	−.05	.09	.03	.16	.02	.12
3. AV goals	4.5	2.0			1.00	.51**	.17	−.01	−.06	−.02	.08
4. AP goals	5.7	2.0				1.00	−.12	−.04	.04	.14	.24*
5. BDI	11.8	8.1					1.00	−.02	−.25*	−.34**	−.17
6. AV SII	23.4	7.5						1.00	.45**	.39**	.24*
7. AP SII	24.7	7.3							1.00	.30**	.42**
8. AV GC	22.8	3.1								1.00	.40**
9. AP GC	23.4	3.2									1.00

*$p < .05$; **$p < .01$. SP = Sensitivity to Punishment Scale; SR = Sensitivity to Reward Scale; AV = Avoidance; AP = Approach; BDI = Beck Depression Inventory; SII = Spontaneous Implementation Intentions; GC = Goal Commitment.

controlling for current depressive symptoms, $F(1, 80) = 1.33$, $p = .25$, $\eta^2 = .01$.

Test of the joint subsystems hypothesis

Logistic regression demonstrated that the BIS × BAS interaction did not predict depression diagnostic group (previously depressed vs. never depressed), Wald $= -0.53$, $p = .59$.

Group differences in goal commitment and planning

There were no statistically significant group differences in either strength of goal commitment, avoidance goals: $F(1, 81) = 0.31$, $p = .58$, $\eta^2 = 0$; approach goals: $F(1, 81) = 0.00$, $p = .98$, $\eta^2 = 0$, or strength of implementation intentions, avoidance goals: $F(1, 81) = 0.21$, $p = .65$, $\eta^2 = 0$; approach goals: $F(1, 81) = 1.81$, $p = .18$, $\eta^2 = .02$. ANCOVAs that included current depressive symptoms as a covariate, yielded similar results for both goal commitment, avoidance goals: $F(1, 80) = 0.50$, $p = .48$, $\eta^2 = 0$; approach goals: $F(1, 80) = 0.58$, $p = .45$, $\eta^2 = 0$, and implementation intentions, avoidance goals: $F(1, 80) = 0.19$, $p = .67$, $\eta^2 = 0$; approach goals: $F(1, 80) = 0.15$, $p = .69$, $\eta^2 = 0$.

DISCUSSION

The current study investigated avoidance and approach motivational systems of temperament and goal orientation as vulnerabilities to depression. Although previous studies have found that both temperament and goal orientation are implicated in depression, the present research is the first to examine the role of both temperament and goal orientation in persons with past episodes of depression based on clinical interviews.

As hypothesised, previously depressed individuals reported more avoidance goals, and this effect remained marginally significant ($p = .05$) after controlling for subclinical depressive symptoms. However, contrary to predictions, previously depressed individuals did not generate fewer approach goals. Also consistent with our hypotheses, previously depressed individuals

reported an overactive BIS compared to their never-depressed counterparts. However, this effect appears to have been the result of elevated subclinical depressive symptoms among the previously depressed; the groups did not differ on BIS activation once these state effects were statistically controlled, suggesting that an overactive BIS is a state marker of depression. Unexpectedly, the previously MDD group reported an overactive BAS compared to never-depressed individuals, and this finding continued to be statistically significant when controlling for subclinical depressive symptoms. Further, we did not find support for the joint subsystem hypothesis, which posits synergistic effects between the BIS and BAS, though the current study may have lacked sufficient power to detect moderating effects.

In terms of goal generation, both the previously depressed group and the never-depressed group generated equal numbers of approach goals suggesting that depression-prone individuals who are not acutely depressed tend to engage in similar reward-seeking, self-regulatory strategies as never-depressed individuals. Interestingly, the previously depressed group did not seem more or less committed to their goals and reported being as planful and engaged in their approach and avoidance goals as never-depressed individuals. In contrast, previously depressed participants generated more avoidance goals compared to never-depressed individuals. Together these findings suggest that the valence of goal formation distinguishes previously depressed individuals from never-depressed individuals and that the tendency to set avoidance goals may be a trait-like feature related to vulnerability to depression. Given that elevated avoidance motivation in the form of the BIS among previously depressed participants appeared to be related to state dysphoric affect, our data suggest that cognitive representations of avoidant self-regulation (specifically, avoidance goals), but not temperamental predisposition to avoidance motivation (specifically, BIS) may serve as a trait-like vulnerability to depression.

Elevated avoidance goals among previously depressed individuals is particularly interesting in light of our unexpected results that these same individuals reported an overactive BAS, raising the possibility that previously depressed individuals have the energy and drive to pursue their avoidance goals. In essence, the BAS may be energising approach behaviour in the service of avoiding aversive consequences. Although the BAS is responsible for orienting behaviour towards reward, it also governs active avoidance, which involves initiating and engaging in approach behaviour in order to avoid punishment (Smillie & Jackson, 2005). This second role of the BAS has not received a great deal of attention in the literature and its effects on behaviour are mostly unknown. In line with this interpretation, Bjornebekk (2007) found that children with an activated BAS tended to focus on performance-avoidance goals and consequently experienced negative affect.

Given our relatively young sample, another explanation of the BAS findings involves developmental changes related to these motivational systems. It is likely that there are changes from adolescence to adulthood in underlying biological structures. For example, Davey, Yucel, and Allen (2008) argued that depression during adolescence only becomes linked with suppression of the dopaminergic reward system after repeated exposures to failed attempts of attaining rewards. A final explanation suggests that the process of recovery from depression involves heightened BAS activity that remains elevated among recently remitted individuals. For example, it may be that recovery from initial episodes involves an increase in BAS activity that reduces depression and ultimately leads to remission. Consistent with this possibility, past studies have demonstrated that elevated BAS among currently depressed individuals prospectively predicts remission (Kasch et al., 2002; McFarland et al., 2006); it may be that the BAS remains elevated among these individuals once they are in remission. However, our ideas concerning the role of the BAS are speculative and based on a post hoc explanation of an unexpected finding.

Conceptually, approach motivation should involve both BAS and approach goal setting (including number of approach goals, commitment to and implementation intentions for these goals), and avoidance motivation should involve both BIS and avoidance goal setting (including number of avoidance goals, commitment to and implementation intentions for these goals). However, BAS and approach goals and BIS and avoidance goals were not correlated in our sample ($rs \leq .17$). It is likely that temperament and goal setting operate at different levels of analysis. Temperament is a trait variable measuring general inclinations, while the goal variables are measuring state effects and specificity to a particular goal. Thus, it is conceivable that these variables might not be correlated. Future research is needed to determine if the present results are reliable or whether they may be idiosyncratic to our sample or due to the particular instruments used to assess these variables.

We acknowledge several limitations. First, although our remission design and statistical control for depressive symptoms helps disentangle state versus trait factors in depression, it is still correlational in nature and vulnerable to potential third-variable explanations. Further, findings may be due to an acquired "scar" of having experienced a previous depressive episode that elicited permanent personality changes (Just, Abramson, & Alloy, 2001). Second, while the current study examined clinically diagnosable depression, it did so in the context of a college student sample. College students may possess a higher predisposition for approach motivation and depressed individuals from this population might be distinct from those from the general community suffering from depression. Third, goal commitment and planning ratings were made on participants' most important goals, which may have contributed to ceiling effects making it difficult to detect group differences on these variables. Finally, given that this is the first study to find an overactive BAS in depression, replication is warranted. Assuming that theses findings prove reliable, it would be important for future studies to examine whether the BAS serves the function of active avoidance in

depression-prone individuals and whether there are developmental changes in the association between motivational tendencies, goal setting and vulnerability to depression.

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