

Mood, self-set goals and examination performance: the moderating effect of depressed mood

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MOOD, SELF-SET GOALS AND EXAMINATION PERFORMANCE:
THE MODERATING EFFECT OF DEPRESSED MOOD

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Abstract

The purpose of the present study was to investigate relationships between mood, performance goals, and examination performance. We tested the notion that feelings of depressed mood are central to the overall mood response and influence the functional impact of anger and tension on performance (see Lane & Terry, 2000). Fifty undergraduate students completed a measure of anger, confusion, depression, fatigue, tension and vigour approximately 10 minutes before a practical physiology examination. Participants also indicated the grade set as a goal for the examination, and rated their confidence to achieve this goal. Depressed mood data were analysed by dichotomising scores into depressed mood group ($n = 23$) or no-depressive symptoms group ($n = 27$). Analysis of covariance (ANCOVA) was adopted to explore the association between mood and performance and whether any differences exist between the depression and no-depression groups. Results indicated that only the anger-performance relationship differed between the depression and no-depression groups, whereby anger was associated with improved performance in the no-depression group. MANOVA results indicated that depressed mood was associated with a negative mood profile and low goal-confidence scores. Future research should investigate relationships between mood states using an ideographic design and explore links between variations in mood with more stable psychological factors such as emotional intelligence.

Key words: Emotion, cognition, academic success, depressed mood, anger.

Mood, Self-Set Goals and Examination Performance:

The Moderating Effect of Depressed Mood

It has been well documented that performing tasks of personal importance such as sitting an examination, participating in a sports contest, and being interviewed for a job elicit intense emotional responses (Collins & Onwuegbuzie, 2003; Constans, 2001; Hanin, 2000, Terry, 1995; Totterdell & Leach, 2001). Research also shows that mood is predictive of performance in such settings (Beedie, Terry, & Lane, 2000; Catanzaro, 1996; Constans, 2001; Gumora, 2000; Totterdell & Leach, 2001).

Several theorists have proposed that mood influences performance by serving an informational function, whereby moods signal the likely outcome of events and help identify potential problems; particularly in the case of important tasks where the outcome is uncertain (Bless, 2001; Brehm, 1999; Gendolla & Krusken, 2002; Schwarz, 1990). For example, positive moods provide information about the task (*this is enjoyable*), about the self (*I am good at the task*), or about a strategy (*I am doing this right*). Therefore positive moods indicate that a situation carries little threat whereas unpleasant moods signal that a situation is potentially problematic (Clore, Wyer, Dienes, Gasper, Gohm, & Isbell, 2001).

Martin (2001) emphasized how context influences this process. For example, an individual is likely to accept feeling sad at a funeral but would be less likely to accept feeling sad at a birthday party and would tend to engage in efforts to adjust such feelings. Similarly, before performing a task of critical importance (e.g., a pilot flying a plane, a surgeon performing an operation) or personal importance (e.g., an athlete trying to win an Olympic medal, a manager giving a presentation to a board of directors) an individual could expect to feel a wide range of positive and negative feelings. Given

that individuals seek to repair negative moods perceived as a threat to performance (Bower, Gilligan, & Monterio, 1981; Erber & Erber, 2001), conscious recognition of the likely functional impact of mood states is very important. Indeed, it has been shown that individuals who report positive moods before performing important and uncertain tasks tend to have previously regulated moods perceived as unpleasant and dysfunctional (Totterdell & Leach 2001).

Negative moods are proposed to derive from discrepancies between personal standards and perceived current status (Carver & Scheier, 1990; Martin & Tesser, 1996; Wicklund, 1979). People in a negative mood feel further from the standard and may analyse the situation carefully, attending to specific details in order to reduce this discrepancy (Cervone, Kopp, Schaumann, & Scott, 1994). When people perform objectively difficult tasks, perceived goal attainability influences the functional impact of negative mood on effort. Those in a negative mood either mobilize little effort because they perceive task demands to be too high, or increase effort because negative mood acts as a warning signal that attainment of achievable goals is threatened (Cervone et al., 1994; Gendolla & Krusken, 2002). Therefore, the relationship between mood and the standard of performance set as a goal is a promising line of enquiry.

Research has demonstrated that different negative moods have different effects on performance (Hanin, 2000; Lane & Terry, 2000; Schwarz & Bless, 1991; Schwarz, 2001). Anxiety has been shown to be associated with good performance in some studies and poor performance in others, whereas depression is consistently associated with poor performance. Lane and Terry (2000) developed a conceptual model to explain these effects. A key part of Lane and Terry's model is the assumption that different dimensions of mood interact to influence performance. They hypothesized that anger

and tension can be either facilitative or debilitating of performance, depending on interactions with depressed mood (interpreted in this context as a transitory set of feelings rather than a clinical condition). Lane and Terry proposed that individuals in a depressed mood tend to direct feelings of anger internally, leading to suppression, self-blame and, ultimately, performance decrements (Spielberger, 1991). Similarly, such individuals tend to transfer tension into feelings of threat and worry, also leading to performance decrements. Conversely, in the absence of depressed mood, it is easier for the arousal component of anger and tension to serve a functional role by signalling the need for positive action (Bless, 2001; Schwarz, 2001). More specifically, anger is likely to be expressed outwardly at the source of the original frustration (or displaced toward another object or person) and may be channelled productively into determination to succeed; and symptoms of tension are more likely to be interpreted as indicating a readiness to perform and be seen as facilitative of performance. Lane and Terry hypothesized that depressed mood would *not* moderate the mood-performance relationship for other mood states such as fatigue, confusion, and vigour. Confusion and fatigue are proposed to be debilitating of performance, and vigour is proposed to be facilitative of performance regardless of depressed mood (see Figure 1).

Insert Figure 1 about here

Research has found pre-performance depressed mood is associated with high scores on anger, confusion, fatigue, and tension with low vigour (Lane & Terry, 2000; Lane, Terry, Beedie, Curry, & Clark, 2001; Lane, 2001; Lane, Lane, & Firth, 2002; Lane & Lovejoy, 2001). By contrast, when individuals experience anger and tension in

the absence of depressed mood, they tend to be associated with vigour and self-confidence (Lane, 2001). Tests of Lane and Terry's (2000) conceptual model have found that depressed mood had a moderating effect on anger and/or tension in the sport of running (Lane et al., 2001; Lane, 2001). Recent research has found support for the proposed moderating effect of depressed mood on concentration tasks in which effort was identified as the major determinant of success (Lane, Terry, Beedie, & Stevens, 2004).

The purpose of the present study was to investigate relationships between mood, performance goals, and examination performance. The grades that students set as goals and the confidence to achieve these goals were also assessed in order to explore some of the cognitive patterns associated with mood profiles between depressed and non-depressed individuals. We tested the notion that feelings of depressed mood are central to the overall mood response and influence the functional impact of anger and tension on performance.

Method

Participants

Participants were 50 undergraduate students ($M = 21.88$ yrs., $SD = 1.86$; 26 male and 24 female) studying for a degree in Sports Studies at the University of the first author. All participants were year 3 students studying for an undergraduate degree in Sport Studies. To progress to year 3 (Level 3 for a full-time student), participants needed to have passed modules at Level 1 and Level 2 (usually taken in year 1 and year 2). Each Level comprises 8 modules, studied over two Semesters. To be able to study for a degree, participants would have had to meet the University entrance criterion.

Measures

Mood

Mood was assessed using the Brunel Mood scale (BRUMS) (formerly called The Profile of Mood States–Adolescent (POMS–A: Terry, Lane, Lane, & Keohane, 1999; Terry, Lane, & Fogarty, 2003). The BRUMS is a 24-item inventory that assesses the mood dimensions of Anger, Confusion, Depression, Fatigue, Tension, and Vigour. Although the BRUMS assesses the same mood dimensions as the POMS (McNair, Lorr, & Droppleman, 1971), Terry et al. (1999) argued that there was need to develop a new inventory for two reasons. First, the original POMS was developed and validated for use with psychiatric outpatients, hence its validity for use in achievement settings is unknown. Second, the original POMS has been criticized for having items not easily understood by other cultures than the North American, something that is problematic in achievement research environments where brevity is important. The POMS has items such as ‘blue’ and ‘grovelly’ that are not immediately understood by UK participants.

Terry et al. (1999, 2003) comprehensively validated the BRUMS. Multisample confirmatory factor analysis has demonstrated factorial invariance among samples of adult students, adult athletes, young athletes, and school children (Terry et al., 2003). Correlations between scores on the BRUMS and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) and the State-Trait Anger-expression Inventory (STAXI: Spielberger, 1991) provide evidence of concurrent validity. Alpha for the present study were anger = .76, confusion = .72, depression = .79, fatigue = .74, tension = .91, and vigour = .73.

Self-set goals and goal-confidence

Participants were asked to indicate the grade in which they had set as a goal for

this examination and rate the confidence they had in achieving this goal. Goal-confidence was rated on a 9-point scale anchored by '*no confidence at all*' (1) and '*very confident*' (9).

Examination Performance

Examination performance was assessed in a physiology module titled: 'Graded exercise testing and electrocardiographic assessment'. Throughout the semester, the student is exposed to a range of practical assessment methods for the evaluation of adult fitness and cardiovascular disease identification. The pathogenesis of cardiovascular disease and subsequent evaluation using exercise stress testing and electrocardiographic interpretation is examined in detail in a practical examination. The student is not permitted notes during the examination and has 30 minutes to complete the assessment and feedback. The student is marked on a number of criteria including knowledge of protocol, successful completion of assessment and quality of feedback given to the patient.

Two examiners following examination completion corroborate marks for the practical examination. Following each examination of each student, the markers presented their grade for the work and agreed the final grade. Work was recorded on video for cases where markers could not agree a grade to be viewed by a third person, although this option was not used in the present study.

Students' grades were available following the examination board. The university marking system ranges from A16 to F0. A16 is the top pass grade, representing an outstanding performance. D5 is the lowest pass grade, representing a satisfactory performance. Grades E4 and E3 represent a marginal fail, and F2 and F1 represent an irrefutable fail. Students score F0 for failing to turn up. An examination of the

distribution of grades indicated that they were normally distributed (Kolmogorov-Smirnov = 0.10, $p = .20$).

Procedure

Ethical approval was sought and granted by the institution of the first author. Participants completed informed consent forms before data were collected. Participants were provided with all relevant information relating to the nature and methodology of the study. Participants were informed that there were no right or wrong answers to the mood scale and were encouraged to answer honestly. Complete confidentiality was assured. Participants completed the BRUMS measures approximately ten minutes before the examination.

Data were analysed by first converting raw scores on the BRUMS to standard T-scores based on normative data for adult students reported by Terry et al. (2003). Depressed mood scores were analysed by separating participants into two naturally occurring groups. Participants who reported zero for all depressed mood items formed a 'No-depression' group. Participants that reported a score of 1 or more were categorised as a Depressed mood group. Recently it was found that the normal score for depression items is zero when mood is assessed in achievement related contexts such as sport (Terry et al., 1999, 2003; Terry & Lane, 2000).

Analysis of covariance (ANCOVA) was adopted to explore whether differences in performance exist between the depression and no-depression groups having controlled/adjusted for differences in mood as the covariate. In order to test whether the association between mood and performance differed between the two groups (no-depression and depression), the ANCOVA fitted separate regression slopes for each group. The procedure used followed the guidelines suggested by Williams (1964) as

follows: First, the saturated model is fitted to the data, i.e., when separate lines are fitted for both groups' data. Second, the homogeneity of group regression lines can be tested using a simple regression analysis as described in standard texts (see Williams, 1964).

The recommended procedure is to carry out hypothesis tests in the following order.

- a) Test the homogeneity of slopes for all groups;
- b) If the homogeneity of slopes is acceptable, then test whether the intercepts can be assumed to be the same;
- c) If both hypotheses one and two are acceptable, then test whether there exists a significant 'common' linear relationship between the two variables regardless of group differences.

MANOVA was used to assess differences in pre-examination mood, the standard of performance set as a goal, confidence to achieve this goal, and performance between no-depressive symptoms and depressed mood group. Correlation was used to assess relationships between mood, goals, goal-confidence and performance in the no-depression and depressed mood groups.

Results

Descriptive statistics for pre-examination mood and performance scores are contained in Table 1. A significant multivariate effect was found for differences in mood, self-set goals, goal-confidence and performance between the depressed mood and no-depression groups. Univariate results indicated that depressed mood was associated with significantly higher anger, confusion and tension with lower scores on goal-confidence. Differences for fatigue and vigour were consistent with theoretical predictions but not statistically significant. There was no significance difference in the

grade achieved by students or the standard of performance set as a goal.

Insert Table 1 about here

The key results for the present study relate to the proposed moderating effect of depressed mood on mood-performance relationships for anger and tension. When we explored the relationship between mood and performance using ANCOVA (allowing separate mood-state slopes for both groups), only the anger-performance relationship differed between the depression and no-depression groups. The Beta weight for the depression group was -0.07 ($p > .05$). In contrast, the beta-weight for the no-depression group was $.44$ ($p = .02$). The two fitted regression lines identified by the ANCOVA were:

- a) Depressed mood group: Performance = $14.2 - 0.07 * \text{Anger}$;
- b) No-depression group: Performance = $-.974 + 0.44 * \text{Anger}$.

Correlations were used to illustrate differences in the strength and direction of performance-relationships in the depressed mood and no-depression group (see Table 2). Relationships between variables in the no-depression group indicate performance was associated with high scores on reported anger, vigour, setting a difficult goal and low tension. Tension showed an inverse relationship with vigour and anger. Tension was associated with confusion. Anger negatively correlated with confusion. Vigour was positively related with the standard set as a goal and the confidence to achieve this goal. For correlations among mood, goals and performance in the depressed mood group,

results demonstrated that performance significantly related with vigour, the standard of performance set as a goal, and goal-confidence. Vigour, self-set goals, and goal-confidence significantly intercorrelated. Confusion was associated with tension, setting an easy goal and low goal-confidence to attain this goal.

Discussion

The present study examined relationships between mood and examination performance. The assumption proposed to explain mood-performance relationships derives from mood states providing a signal of the personal resources an individual can access to cope with task demands (Bless, 2001; Brehm, 1999; Gendolla & Krusken, 2002; Schwarz, 1990; Schwarz & Bless, 1991). The research tested Lane and Terry's (2000) theoretical proposition that mood-performance relationships are influenced by depressed mood. When mood states combine with depression, this is associated with a general negative mood profile, and this profile is associated with poor performance. By contrast, it is proposed that unpleasant mood states such as tension and anger scores are linked with increased effort, and improved performance when experienced independently of depressed mood (Lane & Terry, 2000).

Results lend some support for the notion that depressed mood was associated with negative mood profile as suggested by Lane and Terry (2000). Previous research has found unequivocal support for the association between depressed mood and increased anger, confusion, fatigue, and tension with reduced vigour (Lane et al., 2001, 2002; Lane, 2001). In the present study, this trend was supported for anger, confusion and tension but not supported for fatigue and vigour where the differences were in the hypothesised direction but not statistically significant. The present study also included measures of goal-confidence and the standard of performance set as a goal. Results lend

support to previous research that has demonstrated a significant association between depressed mood and low confidence (Comunian, 1989; Lane, 2001; Relich, Debus, & Walker, 1986).

Findings for the standard of performance set as a goal between depressed and no-depression groups are consistent with previous research (Lane, 2001; Lane et al., 2001). It has been suggested that depressed mood influences the decision to set a difficult goal. It is suggested that participants set a goal as part of a self-regulation strategy to regulate depression. Participants set a difficult goal and hope that goal attainment will reduce feelings of depressed mood (Cervone et al., 1994). By contrast, among individuals reporting no-depressive mood symptoms, individuals tend to use vigour as the basis for setting a challenging goal. Feelings of vigour are associated with a strong sense of efficacy expectations to complete the task (see Lane, 2001), and thus will tend to be associated with setting a difficult goal.

A key part of Lane and Terry's (2000) model is the notion that depressed mood moderates mood-performance relationships for anger and tension. In the no-depression group, anger was associated with good performance and tension was associated with poor performance. Findings for anger are supportive of Lane and Terry's (2000) suggestion that anger experienced without depression should increase effort that could lead to facilitated performance. Previous research has found that anger is associated with cognitive function when inversely related to depression (Hull, Farrin, Unwin, Everitt, Wykes, Wykes, & David, 2003). Hull et al. (2003) distinguished anger control from anger expression and postulated that facilitating effects of anger could be explained through anger-control being theoretically different to anger expression. Findings of the present study are consistent with those reported by Hull et al. (2003) as

participants reported relatively low scores on anger when experienced independently of depressed mood. It is suggested that future research explores interactions between anger and depression using a more sophisticated measure of anger such as the STAXI (Spielberger, 1991). Although Terry et al. (1999, 2003) reported concurrent validity coefficients between anger against STAXI scores, they reported correlations between the intensity of anger scales only.

Findings of the present study showed that depressed mood did not have a direct effect on performance. This result runs counter to some previous research that demonstrates that depressed mood hampers performance (Catanzaro, 1996; Haines, Norriss, & Kashy, 1996; Shaw, 2000). Other researchers have found that depressed mood does not correlate with performance (Clark, Daugherty, Zeldow, Gotterer, et al., 1988). It should be emphasised that reported scores of depressed mood that are completed in achievement settings such as before an examination or sport contests tend to be skewed and lack variance with the majority of participants reporting zero for all depressed mood items (Terry & Lane, 2000; Terry et al., 1999, 2003).

Correlation results show that vigour, goal-confidence and self-set goals were associated with successful performance regardless of depressed mood, a finding consistent with previous research (Lane et al., 2001). It should be noted that low vigour and goal-confidence were associated with depressed mood. Morris (1992) posited that mood's affective content serves a signal function indicating to the individual the likelihood of success or failure in dealings with the environment. In the present study, results suggest that vigour, characterised by feelings of alertness and energy were found to be associated with confidence to achieve the standard set as a goal and performance.

We suggest that mood-performance relationships found in the present study

could be used to inform practice, but before this can be taken forward, further research is needed. First, it is necessary to test the extent to which findings from the present study could be replicated to a different sample. It is acknowledged that results of the present study show associative rather than causative links. Second, we suggest that a thorough examination on intra-individual relationships between mood and performance should be conducted. The use of a cross-sectional research design precludes emphasising the impact these results could have if applied directly to practice. It is argued that future research should use an ideographic approach to identify mood states associated with successful and unsuccessful performance (see Hanin, 2000). In competitive settings, Hanin (2000) has demonstrated mood-performance relationships are highly individualised. Third, research should investigate relationships between mood state changes before, during and after taking an important examination and the relatively new construct of emotional intelligence (Goleman, 1995; Schutte, Malouff, Hall, Haggerty, Copper, Golden, & Dornhein, 1998). Recent research has found links between emotional intelligence and academic performance (Parker, Summerfeldt, Hogan, & Majeski, 2004). It is suggested that individuals high in emotional intelligence would be aware of the potentially facilitating effects of anger on performance and learn to regulate their mood to appropriate states.

It is important to recognise that the study had several limitations. First, validity and reliability coefficients were not obtained for the performance measure. Although it could be argued that the measure used was ecologically valid as it was calculated using standard university procedures, the scientific rigour of such procedures is unclear. Second, the relatively stability of mood states is not known. It is of course possible that mood states changed once the examination started, making inferences from pre-

examination measures redundant. Future research should explore mood states changes over time before and during performance.

In conclusion, results of the present study found anger was associated with facilitated performance among students who reported no-depressive mood symptoms, while vigour and goal-confidence were associated with successful performance regardless of depression.

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Table 1.

A Comparison of Mood Scores, Goals, Goal-confidence and Performance between the Depressed Mood and No-depression Group

	No-Depression (<i>n</i> = 27)		Depressed mood (<i>n</i> = 23)		<i>F</i> _{1,42}	Eta ²
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Anger	52.47	3.06	55.29	7.09	3.51**	.07
Confusion	51.92	8.46	59.36	11.61	6.85**	.13
Fatigue	46.24	6.79	48.12	6.06	1.05	.02
Tension	71.46	14.30	86.01	13.86	13.22*	.22
Vigour	54.27	9.78	52.28	7.15	0.65	.01
Goal	10.74	1.46	10.61	2.08	0.07	.00
Goal-confidence	6.52	1.31	5.78	1.24	4.11*	.08
Performance	9.48	2.71	10.04	2.77	0.52	.01

Wilks' lambda_{9, 40} = .62, *p* < .05, Eta² = .38

** *p* < .05

* *p* < .01

Table 2.

Correlations among Mood Scores, Goals, Goal-Confidence and Performance in the No-Depression Group ($n = 27$) and Depressed mood group ($n = 23$)

	Anger	Confusion	Fatigue	Tension	Vigour	Goal	Goal-confidence
No-depression group							
Confusion	-.44*						
Fatigue	-.03	.22					
Tension	-.29	.65*	.16				
Vigour	.84*	-.36	.07	-.27*			
Goal	.37*	-.03	.20	.14	.35*		
Goal-confidence	.43*	-.67*	.05	-.45*	.31*	.13	
Performance	.41*	-.27	.00	-.39*	.38*	.42*	.24*
Depressed mood							
Confusion	.10						
Fatigue	.10	.21					
Tension	.17	.47*	.04				
Vigour	.18	-.11	.05	.14			
Goal	.14	-.32*	.04	-.08	.60*		
Goal-confidence	-.08	-.39*	-.02	-.25	.44*	.62*	
Performance	-.19	-.05	-.11	-.24	.26*	.55*	.32*

$p < .05$

Figure 1.

Lane and Terry's (2000) conceptual model for mood and performance relationships

