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Mood states, self-set goals, self-efficacy and performance in academic examinations

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Running Header: Mood and performance

1 Abstract

2 The present study investigated relationships between mood, performance goals, and
3 both written and oral examination performance. Fifty-seven undergraduate students
4 completed a mood measure that assessed the subscale anger, calmness, confusion,
5 depression, fatigue, happiness, tension and vigour, indicated the grade set as a goal for the
6 examinations, and rated their confidence to achieve this goal. These measures were
7 completed approximately 30 minutes before each examination. Structural equation
8 modelling results indicated that mood states, self-efficacy and self-set goals predicted 20%
9 of oral examination performance and 7% of written examination performance. In both
10 samples, findings indicate that positive mood states are associated with self-efficacy to
11 achieve self-set goals. We suggest that future research should look at the extent to which
12 intervention strategies designed to enhance mood states are associated with enhanced
13 performance.

14

15 Key words: Emotion, performance, self-efficacy, cognition, applied psychology.

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1 Mood states, self-set goals, self-efficacy and performance in academic examinations

2 There has been an increase in the amount of empirical research suggesting that
3 psychological states such as mood are predictive of performance in situations that have a
4 high degree of personal importance. Examples of such situations include athletic
5 competition (Beedie, Terry, & Lane, 2000) and academic examinations (Catanzaro, 1996;
6 Lane, Whyte, Terry, & Nevill, 2005; Totterdell & Leach, 2001). A theoretical position
7 forwarded to explain these effects are the notion that the moods experienced by the
8 individual serve in an informational manner. The 'mood as information' hypothesis
9 suggests that the affective content of mood states provide information on personal resources
10 to cope with task demands, and it is believed that the predictive effects of mood states are
11 especially salient when the outcome of the activity is uncertain (Bless, 2001; Gendolla &
12 Krusken, 2002). With this in mind, it is likely that negative or unpleasant moods will
13 identify a difficult or problematic situation where information regarding the self, task and
14 strategies employed to cope would be negatively phrased are therefore be associated with
15 low self-efficacy (Bandura, 1990). In contrast, positive moods are more likely to provide
16 functional information for the individual regarding the situation (Clore, et al., 2001), and
17 relate to high self-efficacy.

18 With the knowledge that the 'situation' often influences the mood states held by the
19 individual, one must be aware that when the situation is one of importance, the mood states
20 experienced may influence performance in both a positive or negative manner. Whilst
21 individuals may wish to experience positive moods prior to a difficult or uncertain event, it
22 is often the case that individuals will experience negative moods due to the discrepancy
23 between the demands of the task and the resources that the individual has at their disposal
24 to cope with the situation (Carver & Scheier, 1990; Martin & Tesser, 1996). As a result,
25 individuals who experience negative moods may attend to specific information in greater

1 detail to reduce the discrepancy that may be present for the task (Cervone, Kopp,
2 Schaumann, & Scott, 1994). If that is the case then it may be the goals set within the task
3 that are more appropriate to examine, rather than global performance. For example, in an
4 examination, a student may have a very negative mood because they perceive task demands
5 outweigh personal resources need to achieve a high grade. As a result, they may use the
6 negative mood state to help them mobilize their effort in a functional manner towards the
7 goal of achieving a threshold pass. Alternatively, the negative mood may act in a
8 dysfunctional manner and disable any mobilization of effort due to the attainability of the
9 goal (task demands) being too high (Gendolla & Krusken, 2002). Thus, as argued by
10 Bandura (1990), individuals with low self-efficacy expectations before doing a personally
11 important task could result in experiencing feelings of despondency, especially if they
12 anticipate failure.

13 Taking the theoretical suggestions for the relationships between mood states, self-
14 efficacy and performance forward, recent research (e.g., Lane et al., 2005) has found that
15 pre-examination mood states are not only predictive of performance but are also related to
16 the difficulty of self-set goals and self-efficacy estimates to achieve these goals.
17 Specifically, Lane et al. reported significant positive intercorrelations between vigour, self-
18 efficacy, self-set goals and examination performance among a sample of 50 undergraduate
19 students for a practical examination. Whilst an insight to the potential influence of
20 depressed mood on mood states, goals and performance within an academic context was
21 provided, Lane et al. indicated that before the findings could be used in applied settings,
22 replication was needed. They also commented that future research should seek to explore
23 the predictive effectiveness of mood on different forms of assessment, given that their
24 findings were limited to practical forms of summative assessment. To develop the
25 knowledge and understanding to this area of research, it is therefore appropriate to gain a

1 more detailed understanding to whether similar findings are evident within alternative
2 forms of summative assessment.

3 The aim of the present study is to further the research by Lane et al. (2005) to
4 incorporate alternative forms of academic assessment. The two forms of assessment
5 included a) the traditional written examination, and, b) the contemporary oral (viva-style)
6 examination. For both forms of examination, the purpose was to examine relationships
7 between pre-examination mood states, goals, self-efficacy and actual examination
8 performance. The present study tested the notion that mood states predicted cognitive states
9 (goals and self-efficacy) and that mood states and cognitive states predict performance. The
10 hypothesised model is depicted graphically in Figure 1.

11 _____
12 Insert Figure 1 about here
13 _____

14 Methods

15 *Participants*

16 Volunteer participants were 57 (Male $n = 32$, Female $n = 25$; Age range 18-28
17 years) undergraduate sport students studying for a degree in Sports Science at the
18 University of the first author.

19 *Measures*

20 Mood was measured using the Brunel Mood Scale-32 (BRUMS-32) that has been
21 recently developed (see Lane & Jarrett, 2005) from two previously validated scales
22 (Matthews, Jones, & Chamberlain, 1990; Terry, Lane, Lane, & Keohane, 1999; Terry,
23 Lane, & Fogarty, 2003). The original Brunel Mood Scale (BRUMS: Terry et al., 1999,
24 2003) is a 24-item mood state scale based on the Profile of Mood States (McNair, Lorr, &
25 Droppleman, 1971). The BRUMS assesses the mood states of anger, confusion,

1 depression, fatigue, tension, and vigour. The current 32-item scale was formed by adding
2 the items that assess the subscales of happiness and calmness from the UWIST (Matthews
3 et al., 1990) to the 24-items from the BRUMS. The argument for including a greater
4 number of positive mood states was in response to the frequently cited limitation that the
5 POMS has an excessively negative orientation. To this end, it has been suggested in recent
6 literature (e.g., Hanin, 2000) that positive mood dimensions, such as happiness and
7 calmness, may also influence performance. With the addition of the two new subscales, the
8 BRUMS-32 is suggested to provide a more balanced assessment of positive mood and
9 negative mood.

10 Each of the eight subscales within the BRUMS-32 has four items. Examples of
11 Anger items include “Annoyed” and “Bitter”, Confusion items include “Muddled” and
12 “Confused”, Depression items include “Miserable” and “Unhappy”, Fatigue items include
13 “Exhausted” and “Sleepy”, Tension items include “Nervous” and “Worried”, and Vigor
14 items include “Active” and “Lively”. Calmness items include “Restful” and “Composed”
15 and Happiness items include “Contented” and “Satisfied”. All items within the BRUMS-
16 32 are rated on a 5-point scale where a response of 0 equals “not at all” and 4 equals
17 “extremely”. Alpha coefficients for each subscale in the present study were over .70.

18 *Academic goals and goal-confidence*

19 Prior to each of the examinations, participants were asked to indicate the grade that
20 they are setting as a goal for the examination. They were asked to rate the confidence that
21 they have for achievement of the goal. Goal-confidence was rated on a 9-point scale where
22 1 = no confidence at all, and 9 = very confident.

23 *Examination Performance*

24 The two methods for assessing examination performance included traditional
25 written examination performance and a more contemporary oral examination. The written

1 examination (“Introduction to Sport and Exercise Psychology”) was 1.5 hours in length and
2 comprised two sections where section one had 45 multiple-choice questions that had to be
3 answered. Section 2 had a total of 5 essay titles where students are required to answer 1.
4 The overall grade for the examination took into account performance in both sections.
5 Following the examination, all students work was marked and a total of 10% of the
6 examination scripts were subjected to blind second marking by a subject specialist. All
7 double marked work will then be stored in a unit file and made available for the Subject
8 External Examiner to comment upon within their reports.

9 The oral assessment (“Introduction to Sports Physiology”) was a new form of
10 assessment within the curriculum (see Oakley, 2004 for a full review). The oral
11 examinations lasted for 30 minutes where students were examined in three’s by two
12 members of staff. Although there were three students in each oral assessment, only the
13 student to whom the question was directed was able to respond. Each student was required
14 to answer a total of 6 questions, with 2 questions relating to each learning outcome being
15 assessed. To enable variety in the questions posed, the unit coordinator was required to
16 prepare a question-bank of 10-20 questions for each learning outcome. A pro-forma
17 marking sheet was used to grade student responses to each question on a 0-5 scale, using
18 the written marking criteria, which enabled an overall mark to be given.

19 Although two members of staff examined the students in the oral assessment (thus
20 providing double marking), having gained consent from the students, some of the oral
21 assessments were tape recorded to enable commentary from the Subject External Examiner.
22 For both forms of assessment, confirmed student grades were made available following the
23 Examination Board. The marking system employed ranges from 0-100% where marks of
24 70%+ equated to a 1st class pass, marks between 60-69% equated to an upper second class

1 pass, marks between 50-59% equated to a lower second class pass, marks between 40-49%
2 equated to a third class pass, and, marks of 39% or below equated to a fail.

3 *Experimental Procedures*

4 Prior to the study commencing, participants completed written informed consent
5 forms having been provided with detailed participant information sheets outlining the
6 nature and methodology of the study. Having ensured confidentiality, participants
7 completed a BRUMS-32 approximately 30 minutes prior to their written and oral
8 examinations. The study had ethical approval from the institution of the first author.

9 *Data analysis*

10 A repeated measures Multivariate Analysis of Variance (MANOVA) was employed
11 to examine the differences in pre-examination mood, the performance goal set pre-
12 examination, the confidence to achieve the performance goal, and, the actual examination
13 performance before the written examination and oral examination.

14 Structural equation modelling (SEM) techniques were used to assess the moderating
15 influence of examination type on the strength and direction of performance relationships.
16 The structural model specified that relationships would be *equal* for both examinations.
17 Therefore, poor fit of the model to the data would be interpreted as support for the
18 suggestion that hypothesised relationships varied according to the type of examination.
19 Scott-Lennox and Scott-Lennox (1995) recommended that a fully recursive model with
20 equality constraints on all hypothesized relationships should be used.

21 Results

22 Repeated measures MANOVA results indicate that there was no multivariate effect
23 between psychological state variables by examination type. However, and importantly,
24 results indicate that participants produced significantly higher grades in the oral
25 examination (Wilks' Lambda $_{11,41} = .71$, $p = .16$, Eta² = .29). Structural equation modelling

1 results indicate support for the hypothesised model in the oral examination condition
2 (Comparative Fit Index: CFI = .97) and the written examination (CFI = .98). As Figure 2
3 indicates mood, self-efficacy and self-set goals predicted 20% of performance variation for
4 the oral examination and 7% of the variance in written examination. Predictive paths for the
5 oral examination involved setting a difficult goal, self-efficacy, low confusion, depression
6 and tension and vigor. A difficult goal for the oral examination was associated with feeling
7 calm and happy and low tension and fatigue. Self-efficacy for the oral examination was
8 associated with feeling calm and happiness coupled with low depression, tension and
9 fatigue. For written performance, results indicated confusion and tension significantly
10 hampered performance. A difficult goal was associated with tension and vigor. Self-
11 efficacy was associated with low confusion, calmness, depression and tension.

12 Results indicated strong support for the multisample analysis (CFA = .98). With
13 multisample CFA, the statistics derive from the Lagrange Multiplier Test (LMT), which
14 test the equality of relationships between samples (in this instance assessment format).
15 LMT results indicate that there were no significant differences in the strength of
16 relationships between the two assessments. It is important to recognize that although some
17 variables were significant predictors in one assessment and not the other, relationships were
18 generally weak to moderate.

19 Discussion

20 The present study examined relationships between mood and two forms of
21 examination performance by testing the notion that mood states would predict cognitive
22 states prior to examinations, which in turn would predict performance. Although there
23 were two forms of examinations within the present study, there was little difference
24 between the findings for each. In fact, other than the difference in the amount of variance
25 that the mood and cognitive states collectively contributed to between the examinations, the

1 predictive values of mood states on cognitive states, and cognitive states on performance
2 were similar. In short, the findings generally supported the hypothesized model depicted in
3 Figure 1 where higher positive moods (e.g., happiness) and lower negative moods (e.g.,
4 tension) are suggested to be associated with higher self-efficacy and goal difficulty, which
5 in turn were associated with higher performance levels. This is of particular interest given
6 that positive moods are often associated with a positive perception of the situation (Clare et
7 al., 2001) and that self-efficacy is continually reported to be a major predictor of
8 performance in a variety of settings (Bandura, 1990; Wise & Trunnell, 2001). Also, given
9 that positive moods often suggest the individual to have the appropriate personal resources
10 to cope with the task in hand, it is important to report that in the main they were associated
11 with setting a higher goal, thus supporting the notion that the individuals perceived
12 themselves to have the requisite resources to achieve in situations where the outcome is
13 uncertain (Gendolla & Krusken, 2002).

14 Despite the present study furthering that of Lane et al. (2005) to alternative methods
15 of summative assessment, there is a fundamental difference between the studies. For
16 example, whilst the present study examined the extent to which mood states related
17 cognitive states pre-examination, and in turn how they, related to examination performance,
18 Lane et al. examined the extent to which depressed mood influenced the mood-performance
19 relationship in accord with the conceptual model of mood forwarded by Lane and Terry
20 (2000). Despite the differences in the aims of the studies, there are some consistencies
21 between the findings reported across them. Firstly, Lane et al. reported that irrespective to
22 whether individuals experienced depressed mood, positive mood states influenced cognitive
23 states pre-examination and successful examination performance. This supports the finding
24 within the present study that positive mood states appear to be related to the attainment of
25 high levels of self-efficacy and the setting of difficult goals. Secondly, both studies

1 highlight the potential concerns associated with negative moods, and in particular to how
2 they may provide negative information on the forthcoming task (Gendolla & Krusken,
3 2002), which may lead to lower levels of self-efficacy being experienced, and lower, or
4 inappropriate goals being set prior to the examination (Comunion, 1989; Lane, 2001).

5 Given the consistent findings across the present study and that conducted by Lane et
6 al. (2005), we suggest that whilst the findings could be used to inform practice,
7 practitioners need to be aware of some of the limitations across the studies. Firstly,
8 although the present study extended the work of Lane et al. to an alternative sample and
9 method of assessment, it remains that the results across both studies provide associative,
10 rather than causative links. Secondly, the two studies employed cross-sectional research
11 designs, which reduce the applied impact of the findings due to a lack of intra-individual
12 examination of the mood, cognitive state and performance relationships. As a consequence,
13 we suggest that future research should follow a more applied research design and examine
14 mood states associated with functional cognitive states and successful performance levels
15 via idiographic methods. This notion has been reinforced further by Hanin (2000) who
16 suggested emotion-performance relationships to be highly individualised and as a result,
17 worthy of intra-individual study. On this point, the present study did not seek to intervene
18 among participants reporting negative mood states and low levels of self-efficacy and
19 dysfunctional goals prior to examinations. Instead, it sought to test mood-performance
20 relationships in the two examinations rather than seeking to conduct an intervention to
21 alleviate symptoms of inappropriate moods and other unpleasant cognitive states.

22 Therefore, future research should seek to identify individual mood-profiles associated with
23 high levels of self-efficacy, functional goals and examination success across different types
24 of examinations, and develop interventions that can be used to bring about modifications in

1 mood states so that participants are in their ideal cognitive state and performance states
2 before examinations.

3 A second, but related line of further research should investigate relationships
4 between mood state changes before, during and after taking an important examination. His
5 may be even more salient given that it is possible for mood states to change upon
6 commencing the examination, thus making the relationship between pre-examination mood
7 and performance questionable. Also, researchers may wish to consider examining the
8 relationships between mood throughout performance and emotional intelligence (Goleman,
9 1995; Schutte, et al., 1998), especially seeing that recent research (e.g., Parker,
10 Summerfeldt, Hogan, & Majeski, 2004) has found links between emotional intelligence and
11 academic performance. Should such work be conducted, it would be expected that
12 individuals who have high levels of emotional intelligence would be aware of the
13 potentially facilitating effects of mood states and be able to regulate their mood to
14 appropriate states to maximize performance.

15 In conclusion, results of the present study found some relationship between mood
16 states, cognitive states and performance. Irrespective of examination type, positive mood
17 states were associated with more facilitative cognitive states and performance with negative
18 mood states hampering performance. Finally, future research examining the relationships
19 between mood states and performance is required from an idiographic approach.

20

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Table 1.

Repeated measures comparison of Mood Scores, Goals, and Goal-confidence between the Oral and Written Examinations

	Written		Oral		<i>F</i>	<i>P</i>	<i>Eta2</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Anger	0.26	0.46	0.20	0.36	1.46	0.23	0.03
Confusion	1.10	0.95	1.11	0.96	0.42	0.52	0.01
Calmness	1.52	0.68	1.53	0.62	0.00	0.97	0.00
Depression	0.53	0.83	0.44	0.75	1.06	0.31	0.02
Fatigue	1.00	0.95	0.96	0.91	0.28	0.60	0.01
Happiness	1.69	0.74	1.64	0.70	0.23	0.63	0.00
Tension	2.08	1.07	2.04	1.08	0.10	0.76	0.00
Vigour	1.90	0.82	1.94	0.79	0.08	0.78	0.00
Self-efficacy	5.69	1.31	5.79	1.16	0.01	0.92	0.00
Goal	58.08	11.08	56.35	9.61	2.15	0.15	0.04
Performance	56.42	11.08	62.06	13.43	7.34	0.01	0.13
Wilks' Lambda $_{11,41} = .71, p = .16, \text{Eta}2 = .29$							

Figure 1. Hypothesized model for relationships between mood states, self-set goals, self-efficacy and performance

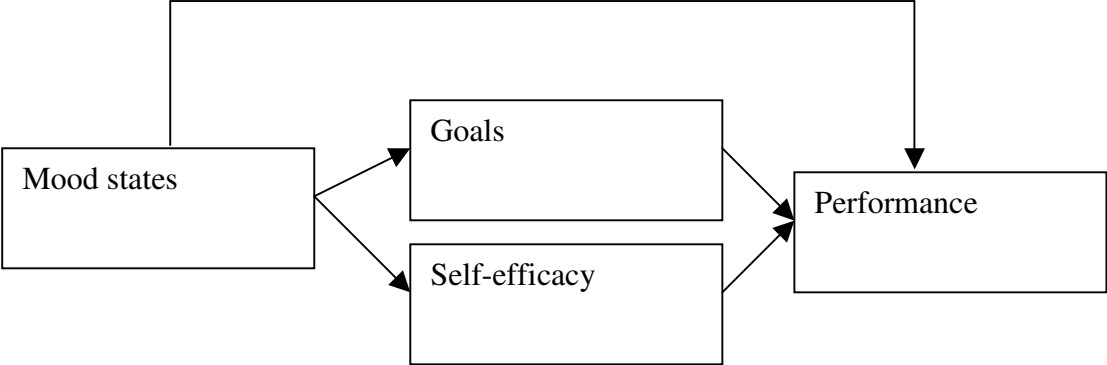
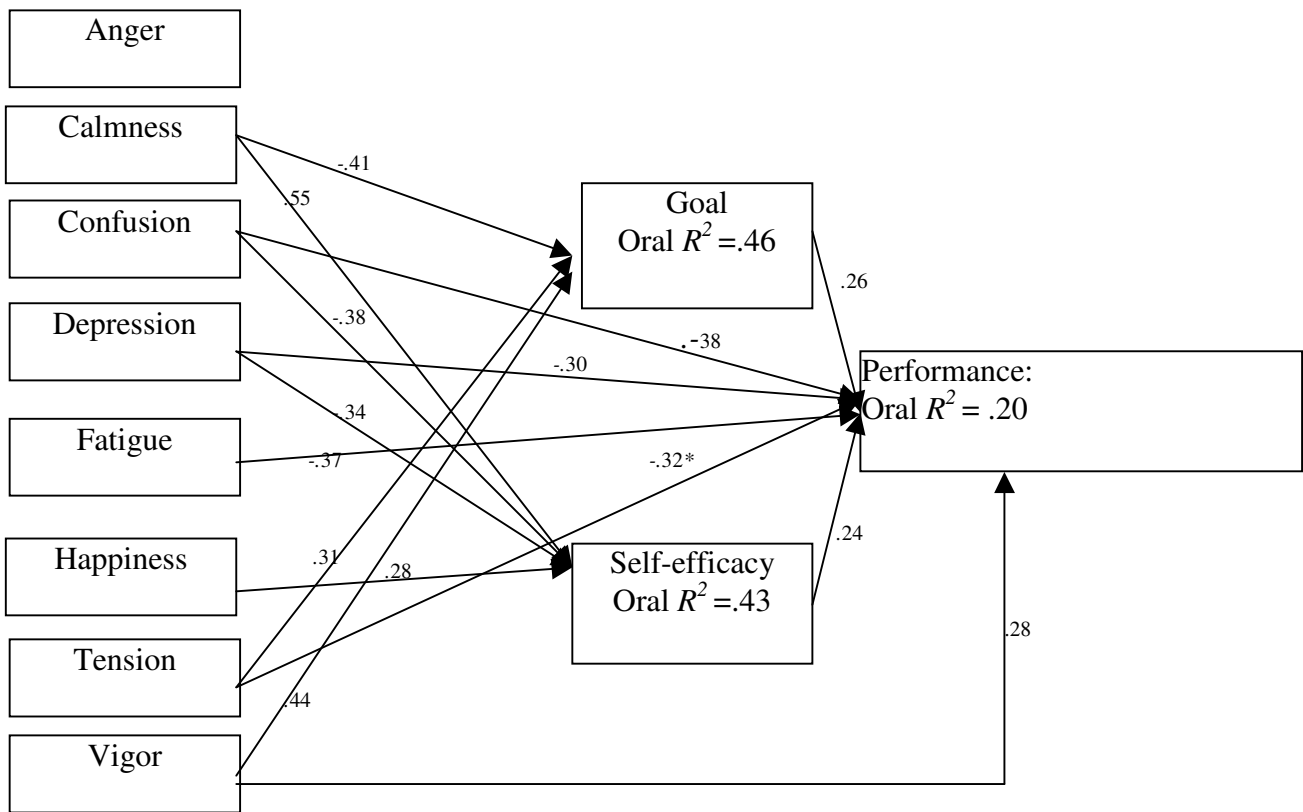
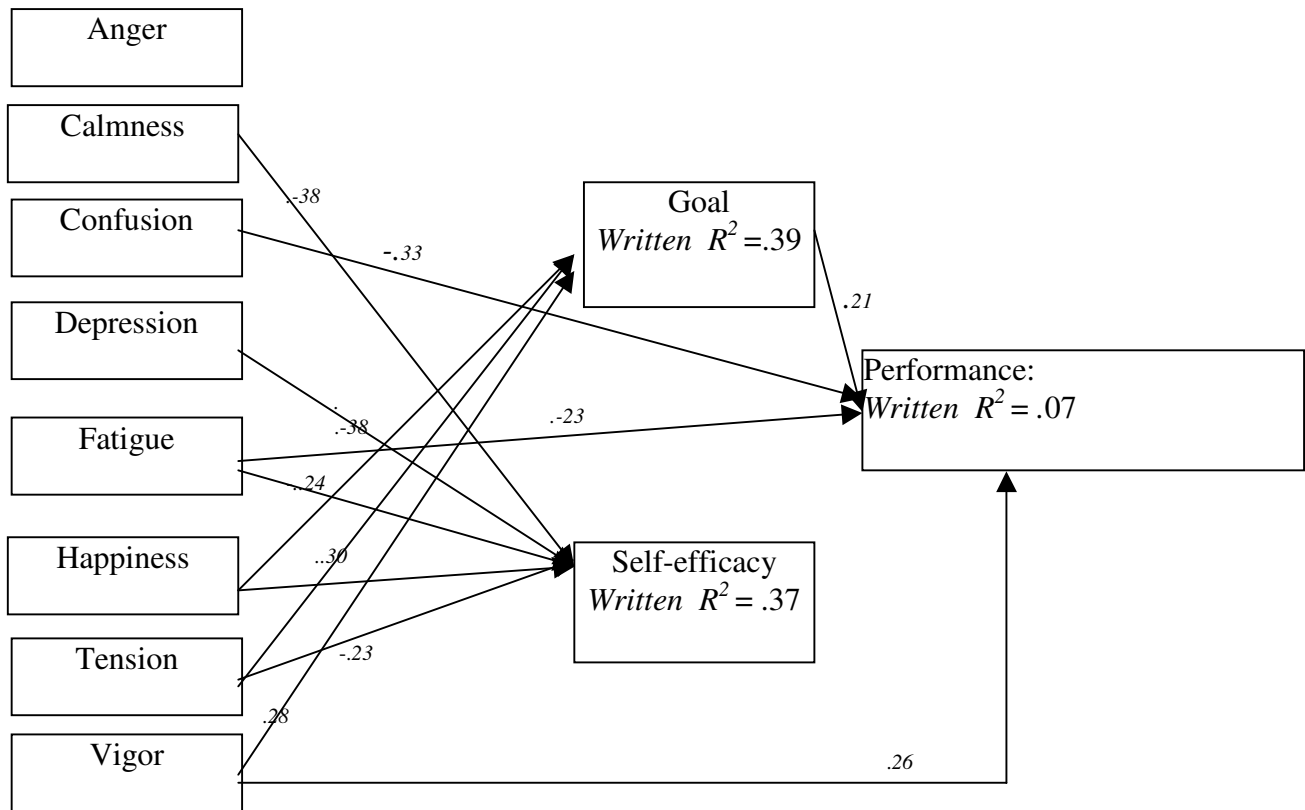


Figure 2. Significant paths predicting Oral examination performance from self-efficacy, goals and mood states between different assessment methods



* $p < .05$

Figure 3. Significant paths predicting Written performance from self-efficacy, goals and mood states between different assessment methods



* $p < .05$