UNIVERSITY OF EXETER

DOCTORATE IN CLINICAL PSYCHOLOGY

MAJOR RESEARCH PROJECT

Part 1: Literature Review

Association between Performance Task Goals, Mastery Task Goals and Depressive Affect

Part 2: Empirical Paper

Relationship between Depressive Symptoms, Performance and Mastery Goals, Rumination and Affect

Submitted by George Baines to the University of Exeter
as a thesis for the degree of Doctor of Clinical Psychology, July 2014

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: …………………………………………………………..

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DOCTORATE IN CLINICAL PSYCHOLOGY

Part 1: Literature Review

Association between Performance Task Goals, Mastery Task Goals and Depressive Affect

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Supervisor: Dr. Nick Moberly

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identified and that no material has previously been submitted and approved for the

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Abstract

The review aimed to explore associations between task goals, specifically performance and mastery goals, and depressive affect. Specifically the review sought to explore how this association had been researched and what findings have arisen from this literature. Following a process of filtering, 14 studies were included for review. A range of study designs were adopted to research this association from cross-sectional correlational designs to experimental designs. Goal orientation and depressive affect almost exclusively were measured using standardised and non- standardised self-report measures. Performance goals, particularly performance avoidance goal where one aims to avoid proof of inability in a particular domain or worthlessness more globally, were found to be positively associated with, and a main predictor of, depressive affect. Mastery goals were found to have the opposite association to depressive affect. However, these studies were limited in their ability to infer causal links between these constructs due to their study design and methods of measurement. Future research adopting longitudinal using daily measures, and experimental designs where goals are manipulated were proposed.

Key words

Introduction to the topic area

All humans engage in the pursuit of goals, which may be trivial or grandiose, focus on approach or avoidance (Klinger, 1977). Indeed, goal pursuit may be considered to be the key to human motivation (Emmons, 1986). Our behaviours, actions, thoughts and beliefs are all influenced by our motivation, with affect shown to be related to perceived progress towards personal goals (Carver & Scheier, 1990). Brunstein (1993) found that perceived progress towards accomplishing life goals predicted levels of well-being among undergraduates. Motivation is relatively understudied compared to cognition and affect, but is central to our understanding of human behaviour.

Goals may be separated into "life goals" (i.e. long-term, "desire to be" goals) and "task goals" (i.e. situational, "desire to do" goals) This review will be focusing on the domain of "task goals" and potential relationships between these goals and depression. Task goals may be thought of as representing one's goals for a defined task, usually in an achievement context where performing to a standard of excellence is salient. A significant body of research exists exploring the link between academic performance and depressive affect (Hysenbegasi et al., 2005; Andrews & Wilding, 2004), but few studies have explicitly examined the type of goals that people bring to these tasks.

The majority of research into task goals has been undertaken in an achievement context, with studies in the field of educational psychology leading to the concept of mastery and performance goal orientations (Diener & Dweck, 1980). A mastery goal is a goal in which the aim is to improve abilities, with setbacks viewed as opportunities to change. Performance goals are concerned with demonstrating competence and gaining favourable social judgements. Performance goals have been further partitioned into performance-approach and

performance-avoidance goals (Elliot & Harackiewicz, 1996). The approach-avoidance distinction could be considered to be one of the oldest psychological ideas. William James (1890) noted that pleasure is a "tremendous reinforcer" of behaviour and pain a "tremendous inhibitor" of behaviour. In this statement James recognised our basic goal to approach desired states and/ or to avoid undesired outcomes (see also Elliot & Thrash, 2002, for a modern view). A performance-approach goal is one which aims to prove self-worth through demonstrating ability and attaining favourable social comparison judgements. Conversely, a performance-avoidance goal aims to avoid proof of worthlessness and is concerned with avoiding failure and preventing unfavourable social comparison judgements.

A large body of evidence exists to suggest that a positive performance outcome is more likely to be achieved with a mastery goal orientation, compared to a performance goal orientation (Butler, 1987; Button et al., 1996; Phillips & Guly, 1997; Vandewalle et al., 1999). However, fewer studies have investigated the relationship between task goals and subjective well-being, including depressive symptoms. Kaplan and Maehr (1999) researching in the field of education, found the pursuit of mastery goals to be positively associated with general indices of well-being (emotional tone, peer relationships, impulse control and affect at school). Performance goals, on the other hand, were found to be negatively related to emotional tone, impulse control and affect at school. People with performance-avoidance goals have been found to be more likely to present with depressive behaviours, than those with either performance approach or mastery goals (Cury et al., 2006; Dweck & Leggett, 1988; Elliott & Maier, 2006; Midgely & Urdan, 2001; Pekrun et al., 2006).

Based on Dweck's work and recognising that earlier cognitive theories of depression had neglected motivational factors, Dykman (1998) proposed a goal-orientation model for explaining and predicting depression (known as social cognition theory). Cognitive and social cognition models have shared origins in attribution theory (Weiner & Kukla, 1970) and helplessness theory (Abramson, Seligman, & Teasdale, 1978; Seligman, 1975). Both models are concerned with negative self-attributions following negative events. However, Social Cognition theory recognises that positive self-attributions arising from positive events may also lead to vulnerable self-beliefs. Another difference between the models is that cognitive theories of depression apply to beliefs about the world, as well as the self, whereas vulnerable self-beliefs are only concerned with the self.

Rothbaum et al. (2009) elaborated on Dykman's theory of depression, paying more attention to the beliefs underlying self-worth goals (known as performance goals when they relate to a single domain of ability). Social cognition theory proposes that people with vulnerable self-beliefs tend to adopt self-worth goals when encountering prolonged stressors, such as failure or loss, causing them to behave in ways which predispose and perpetuate depression (Dweck & Leggett, 1988; Rothbaum et al., 2009). Rothbaum et al. consider there to be three ingredients to a vulnerable self- belief: (1) the belief that self-abilities are stable or fixed, (2) the belief that stable abilities exist in multiple domains (global self-beliefs) and (3) the belief that self-worth is dependent on these abilities (contingencies of self-worth, e.g. Cury et al., 2006). It is proposed that those with vulnerable self-beliefs are likely to adopt goals that either attempt to prove their self – worth (approach self-worth goals), or goals that aim to avoid worthlessness (avoidance self-worth goals).

Approach performance goals are thought to be more adaptive than avoidance performance goals (Cury et al., 2006), however, people with approach performance goals have been shown to shift their self-beliefs from positive to negative and to shift their goals from approach to avoidance performance goals following prolonged periods of failure or stress (Elliot & Harackiewicz, 1996). Rothbaum et al. (2009) proposed that the key to alleviating depression was a move from performance goals to learning goals and from cognitive vulnerabilities to the opposite beliefs.

Social-cognitive models of depression combine theory about human motivation (theory that is interested in why we do things) with the pre-existing cognitive models. The current review will systematically and critically review the literature around goal orientation and depressive affect. It will attempt to answer the question: "How are performance and mastery task goals associated with depressive affect?"

It is hoped that a better understanding of the relationship between goal orientation and depressive affect may lead to an improved therapeutic outcome for clients. Goal setting is widely acknowledged to be an important aspect of therapy. In cognitive behavioural therapy, for example, one of the first tasks is to agree upon clear realistic goals (Beck, 1995). An improved understanding of the goals that people adopt may mean that therapists are better equipped to aid their clients in developing appropriate treatment goals and to recognise when the goal orientation that their client is adopting may be maladaptive.

Conceptual and definitional problems

Different terms used to describe goal orientation

Mastery and performance goals have been referred to using several different terms. Mastery goals have been referred to as "learning goals", "task-focused goals", or "growth seeking goals". Performance goals have also been referred to as "ability goals" or "ego focused goals" or "validation seeking goals" (Ames, 1992; Anderman & Maehr, 1994; Dweck, 1986; Dykman, 1998; Kaplan & Maehr, 1999).

Dispositional trait versus situational characteristic

There has been some debate as to whether goal orientation should be considered as a dispositional trait or a situational characteristic. Where researchers employ a manipulation, it can be argued that they are treating goal orientation as a situational characteristic, whilst studies assessing goal orientation through the use of questionnaires are assuming it to be a dispositional characteristic. Button et al. (1996) suggest that goal orientation can be considered as a "somewhat stable individual difference that may be influenced by situational characteristics". This review will include studies where authors have employed both correlational and experimental approaches.

Method

The research question for this review is: How is the adoption of performance and mastery task goals associated with depressive affect?

The search strategy involved systematic review of published peer- reviewed articles from 1978 to 2014. Three databases were searched including Web of Science, PsycINFO, and Medline PubMed. The following search terms were used to search titles, abstracts and key words, employing Boolean logic: "Depress*" OR

"Sad*" OR "Low Mood" AND "Performance" OR "Mastery" OR "Validation" OR "Self Worth" OR "Learning" OR "Ego" or "Task" AND "Goal" OR "Goals" OR "Motiv*".

Inclusion/exclusion criteria

To be included in the review, studies needed to have (a) the measurement or manipulation of task goals, specifically, performance goals (with or without dichotomisation into approach and avoidance variants), and mastery goals (b) measurement of depressive affect or state negative affect associated with depression such as sadness or low mood. All types of study designs were considered for the review. Studies were excluded if (a) not available in English, (b) full text was not obtainable, (c) measured other types of goal, other than task goals, specifically life or personal goals (Locke & Latham, 2013; Dickson & McLeod, 2004), (d) were not original research (e.g., review papers or book chapters). A total of 426 citations resulted from these combinations of search terms across the databases. Removal of duplicates and screening of titles and abstracts led to 25 full-text papers being read. A further 11 studies were excluded based on inclusion/exclusion criteria, resulting in 14 papers for review.

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┌─────────────────────────────────────────────────────────┐
│  Databases Searched: Web of Science, PsycINFO.          │
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│  Number of records identified                           │
│  through database searches = 786                        │
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│  Titles screened. Number of records                     │
│  deemed to be appropriate = 59                          │
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│  Number of records once duplicates                      │
│  removed = 28                                           │
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│  Abstracts read & references                            │
│  screened. Number of records added = 3                  │
│  N = 31                                                 │
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Abstracts read & references screened. Number of records added = 3
N = 31

Number excluded as unable to obtain full text = 6

Number of full texts read = 25

Number excluded for violating inclusion/exclusion criteria = 11

Papers to be included in the review = 14

Figure 1. Search strategy process flow chart including the identification, screening and inclusion of papers for the review

Papers were reviewed and data extracted using a data extraction form (see Appendix A) and the Cochrane Collaboration's tool for assessing risk of bias (See Appendix B) was used to assess their quality. The relevance and suitability of the designs, methods, data analyses, and applicability of results to the target sample population were all considered.

Table 1. Studies included in the review including study characteristics, measures, findings and critical evaluation

Study	Study Aims	Design	Sample characteristics	Manipulation and/or Measures	Main findings & estimated effect size (d)*	Evaluation & Risk of Bias
Sideridis (2005) (Study 1 in series of 5 studies)	To examine and expand on Dykman's theory that performance goal orientation leads to depression vulnerability.	Cross-sectional correlational	Place of Study: Greece Elementary (Primary) School children, n= 214, 155 boys, 99 girls	**Goal orientation measure:** Measured using amalgamation of different items used in previous studies. **Other measures:** CDI (trait mood), PANAS-C (state mood), RCMAS (trait anxiety), Rosenberg SES (Self-esteem)	Performance-avoidance goal orientation significantly positively correlated with negative affect, depressive mood, and trait anxiety. Performance approach and mastery significantly negatively correlated with same measures. No power calculation included.	**Strength:** Large sample size. Multiple measures of symptoms associated with depression, as well as depression questionnaire. **Limitations**: Reliance on self-report measures at same point in time. Source of bias: Arbitrary post testing separation into mastery, performance avoidance and performance approach groups based on 'mean splits'.
Travers, Bohnert, & Randall (2013)	To examine relationship between depression and educational climate and goal orientation of affluent adolescents	Cross-sectional Correlational	Place of Study: USA 133 Adolescents students (mean age = 15.54 yrs.) 42% male, 58% female	Measures given online **Goal orientation measure:** Task & Ego in Sport Questionnaire (Adapted for general school) (Duda & Nicholls, 1992) **Other measures:** Life Satisfaction Questionnaire (Deiner et al., 1985) PMCSQ YSR-D (Clarke, Lewisohn, Hops, & Seeley, 1992)	Regression and correlation analysis. Performance goal positively correlated to depression and anxiety. Mastery negatively correlated. Performance and mastery goal orientation mediate relationship between motivational climate of school (Performance or mastery encouraged in school), and depression plus well-being.	**Strengths:** Combines socially ascribed goals (climate) with intrapersonal goal orientation in context of depression and anxiety. **Limitations**: One point of assessment, possible self-selecting bias of participants with confounding traits, no comparison group. Source of bias: Sampling-Reliant on completion of measures at same time point (contamination of sate factors more possible.
Tuominen-Soini, Salmela-Aro, & Niemivirta, (2008)	To examine the relationship between subjective well-being and academic task goal orientation.	Cross-sectional correlational.	Place of study: Finland 1321 adolescents. All 15 and 17 year olds in the academic system in the city in which	**Goal orientation measure:** Measured using approach developed by Niemvirta (2002) 5 includes scales one for	ANOVA tests revealed – Mastery oriented students display less depressive symptoms than other orientations	**Strength:** Large sample size, Delineate different goal orientation through statistical means- factor analysis of many scales.

				each goal orientation-mastery intrinsic, mastery extrinsic, performance avoidance and performance approach, and avoidance orientation. –factor analysis used to delineate goal orientation. **Other measures:** Rosenberg Self Esteem Scale (General well-being) Little's Personal Project analysis inventory (Educ. Personal goal appraisal) School related burnout measure (no proof of validation provided) Grade point average (Academic achievement)	including performance.	**Limitations:** Overreliance on self-report questionnaires, Mood measures less in depth. Cross sectional design weaknesses
			research took part. 708 young women, 613 young men.			
Flett, Besser, & Hewitt (2014)	To investigate associations among trait perfectionism, perfectionistic self-presentation, validation seeking, rejection sensitivity + depression in a community	Cross-sectional correlational	Place of study: Israel 183 young adults from a community sample. 92 men and 91 women. Average age 24.23 years.	**Goal orientation measure:** GOI- Dykman (1998) **Other measures:** Sensitivity to rejection scale. CES-D (depression) Multidimensional perfectionism scale (Hewitt & Flett, 1991) Perfectionistic self - preservation scale. (Hewitt et al., 2003)	Multiple regression analysis: Validation seeking (performance) goal orientation mediated the predictive relationship between perfectionistic self-presentation (interpersonal orientation) and depression.	**Strengths:** Community sample. **Limitations:** Recruitment and methodology poorly/ not described. Reliance on self-report measures State factors like mood etc. that may confound concurrent completion of questionnaires not assessed. No causal links can be concluded due to correlational design. Source of bias: Lack of procedural information.
Rusk, Tamir, & Rothbaum, (2011)	To examine the role of rumination as a defensive mechanism	Study 1: Cross-sectional correlational	Place of study: 2011 Study 1: 62	**Goal orientation measure: :** Study 1:'Adapted' GOI-	Study 1: Participants with performance goals positively correlated	**Strengths:** Researcher blind to hypothesis,

	(mediator) in the relationship between performance goal orientation for emotion regulation and depressive symptoms.	Study 2:Cross-sectional correlational	undergraduate participants 27 male 35 female aged 18-24 Study 2: 94 Participants 49 female, 44 male aged 18-27	Dykman, (1998) Study 2: GOI (Dykman, 1998) Goal Measure: Measure items developed and used by Elliot & Church (1997) **Other measures:** SBDI-II (Depression) RRS-RSQ (Rumination) WBSI (thought suppression) ERQ- Cognitive re-appraisal (study 2 only)	with rumination, thought suppression, and depressive symptoms. Learning goals negatively correlated with these symptoms. Regression analysis showed performance goals main predictor of depressive symptoms, but not mediated by rumination, whilst learning goals did not predictor of depressive symptoms (high learning goal=low depressive symptoms). Study 2: performance avoidance goals predict large amount of variance in depressive symptoms and rumination. Rumination and thought suppression partial mediate relationship between performance avoidance and depressive symptoms. Learning mastery goals correlated to reflection and negatively correlated to depressive symptoms but not significant predictor of depressive symptoms.	Component analysis used to develop goal orientation measure. **Limitations**: Study 1 and 2 correlational at one time point.-no causality can be inferred, plus biases in filling in multiple forms at the same time. Potential Source of bias: Monetary incentive to participate, leading to Potential sampling bias.
Kaplan & Maehr (1999)	To examine the impact of performance and mastery goals at school on student well-being.	Cross-sectional correlational design 90 item survey administered by research assistant in class. Items were read aloud	Place of study: 168 sixth grade students (91 girls, 77 boys) working class community. Ethnicity included in data.	**Goal orientation measure:** PALS (Midgely, 1993)-derive ego 'performance' goals and task 'mastery' goals **Other measures:**	Correlations: Pursuing mastery goals was found to have a sign. Positive relationship with all indices of well-being. Pursuing performance goals found to have a	**Strengths:** Large sample size. Multiple measures of symptoms associated with depression, as well as depression questionnaire. **Limitations:**

				Scale adapted from Self –Image Questionnaire for Young Adolescents (SIQYA) 90 item survey (General well-being) PANAS-C Wolters, Garcia, and Pintrich (1992) (School related affect) Invalidated items of disruptive behaviour.	significant negative relationship with two of the general indices of well-being and affect at school. Structural equation modelling used to investigate role of perceived efficacy, on goal orientation and subjective well-being.	Reliance on self- report measures at same point in time.
Sideridis (2005) (Study 3 and 5 in series of 5 studies)	**Study 3**: To test prediction of Dykman's (1998) model that those with performance goals will respond with more negative feedback following stressor (failure) than mastery goal, **Study 5**: To examine the predicted role of goal orientation in regulating the generation of depressive symptoms including anticipatory anxiety, effort withdrawal and lack of persistence, and negative affect following failure.	Study 3: Correlational with lab stressor- Participants complete measures before and after challenging academic task Study 5: Prospective.	Place of Study: Greece Study 3: Elementary (Primary) School children, n= 214, 155 boys, 99 girls	**Goal orientation measure:** Measured using amalgamation of different items used in previous studies. **Other measures:** CDI (trait mood), PANAS-C (state mood), RCMAS (trait anxiety), Rosenberg SES (Self-esteem)	**Study 3**: no difference in negative affect, depressive mood, or anxiety between performance avoidance, performance approach or mastery goal individuals. **Study 5**: performance avoidance positively 'linked' to negative affect, anxiety and depression. Performance approach was not linked to negative affect, whilst mastery goals negatively linked to negative affect, anxiety and depression.	**Strength:** Large sample size. Multiple measures of symptoms associated with depression, as well as depression questionnaire. Range of methods employed to study and analyse predicted relationships. **Limitations:**
Sideridis (2007)	To examine the relationship between goal orientation and affect and psychopathology (depression) following a stressor	Correlational with lab. stressor	Place of study: Greece 104 students with Learning Disabilities, 58 boys and 48 girls	**Goal orientation measure:** Measured using combination of items from two different questionnaires. Internal consistency reportedly high. Goal orientation assessed from scores although procedure not	When clients 'dummy' grouped into performance and mastery, no significant difference between goal orientation group on outcomes between TI and T2. Structural Equation Modelling suggests positive link between	**Strength:** Novel cohort to research using goal orientation theory. **Limitations** Goal orientation identification procedure unclear- appears allocation to group for analysis vulnerable to arbitrary argument, Overreliance on self-reports IQ not obtained so presence

				clear on reading. **Other measures** (revised for Greek population) CDI-depression PANAS-C (state mood), RCMAS (trait anxiety), Rosenberg SES (Self-esteem), Effort –verbal feedback from others.	performance avoidance goal and negative affect, anxiety and depression plus negative link to self-esteem. Mastery goals but not performance Approach goals positively linked to positive affect and achievement.	of LD unknown (sample may not be homogenous) Use of correlational structural modelling procedures following non- sig. between group tests of difference ANOVA results.
Dykman (1998) (Study 5 in a series of 5 studies)	To examine whether those with performance goals (validation seeking goals) are more likely to experience depressive symptoms following stressful events.	Prospective Design with naturalistic stressor	Place of study: USA Undergraduate population n= 104 at Time 1 (T1), n= 68 at Time 2 (T2) More women (n=44) than men (n=24) at T2.	**Goal orientation measure:** Measured using Goal Orientation Inventory (GOI) developed and psychometrically validated by authors. **Other measures:** BDI-Beck depression Inventory NLES- Negative Life Events Scale	Hierarchical moderation regression analysis: Interaction between stress and goal orientation found. As stress increased, those with validation seeking goals reported higher depressive symptoms than those with growth mastery goal orientation, no difference at lower stress levels. No power calculation reported.	**Strength**: Longitudinal design i.e. measurement across time allow prospective hypotheses to be tested. **Limitations**: Reliance on self-report measures, requiring accurate reflection on autobiographical memory of stressful events. Potential source of bias - those retested at T2 have particular personality attributes (striving, high need to be academic competent) compared to those who dropped out at T1.
Lindsay & Scott (2005)	To validate Dykman's model that performance goals perpetuate depression and also personality styles theory, suggesting autonomy not sociotrophy influence depressive affect in failure.	Prospective longitudinal with naturalistic stressor	Place of study: USA 152 undergraduate participants -time 1 129 (37 male, 92 female) at T3- 23 drop out	**Goal orientation measure:** Measured using GOI, **Other measures** PSI, BDI-II, Rosenberg Self Esteem, Exam Satisfaction scale	Hierarchical regression analysis- Goal orientation moderates relationship between exam performance dissatisfaction and dysphoria. Greater dysphoria, self-esteem loss, negative affect, and loss of subjective well- being at higher levels of Validation seeking goal orientation.	**Strengths:** Change in depressive symptoms measured over time. Use of depression measure. **Limitations:** Consideration of confounding factors limited in regression analysis. Could have looked at percentage of participants who changed to be formally diagnosed as clinical depressed. This not reported however.

					Validation seeking positively correlated to dysphoric symptoms	
Pekrun et al. (2006)	To test hypothesised links between performance-avoidance, performance approach, and mastery achievement goals and achievement affect.	2 Prospective Studies, with naturalistic stressor	Study 1: Place of study Germany 102 undergraduate participants (originally 182, 80 lost through attrition between T1, 3 weeks into semester, and T2, 12 weeks into semester) Study 2: Place of study. USA 167 undergraduate participants (Originally 225, 58 lost through attrition between T1, 2 weeks into semester, and T2, 14 weeks into semester)	**Goal orientation measure: :** Achievement Goal Questionnaire (Elliot & McGregor, 2001) **Other measures:** Achievement Emotions Questionnaire (Pekrun et al., 2002) Marlowe Crowne Social Desirability Scale (Crowne & Marlowe, 1960) Clark & Watson's(1990) Brief temperament survey 2 item Elliot & Church (1997) competence measure.	Performance avoidance goals were positive predictors of hopelessness, shame and anxiety. Study 2, controlling for social desirability, hierarchical regression analysis used to find performance avoidance goals are positive predictor of hopelessness. Mastery goals were negative predictors of anxiety and hopelessness.	**Strength**: Clear delineation of times in which emotion and goal assessment assessed. Confounding variables controlled including perceived competence, social desirability, and gender. Attrition analysis completed-no characteristic differences found between sample before and after attrition. **Limitations**: High attrition rate study 1 (but see above)
Cole, Matheson, & Anisman (2007)	To examine the relationship between ethnic identity, academic performance, goal orientation, social support, and depressive and anxiety symptoms over an academic year.	Prospective with naturalistic stressors. 3 assessments over the academic year.	Place of study: Canada Undergraduates: 261, 151 female, 112 male.	**Goal orientation measure:** Goal achievement items- (Elliot & Church, 1997) **Other measures:** BDI-II (depressive symptoms) Spielberger Anxiety Inventory	No regression analysis: Strong positive correlation ($p<0.001$) between avoidant goal orientation, and depressive symptoms, as well as performance avoidance goals and anxiety symptoms was found.	**Strengths:** Longitudinal Drop-out rate described and threats to validity and reliability, from change in demographic and other measures accounted for. **Limitations:** No further analysis was done to disentangle the nature of relationship between goal orientation and depressive symptoms. Self-report measures. Assumption achievement goals trait not state- only Measure: At T1
Cron, Slocum, VanderWalle,	To explore the effect of goal orientations	Prospective with naturalistic stressor	102 undergraduates (82 participants data	**Goal orientation measure:**	Multiple regression indicates:	**Strength:** Data collection over four time

Qingbo Fu (2005)	(potential mediator/ main predictor) on negative affect (potential mediator or main predictor) post performance test and future goal setting (dependent variable).		used for final analysis if they performed worse than they expected on exam at time point 3 of assessment.	Performance avoidance, approach and mastery assessed using Vandewalle's assessment (2001) **Other measures:** Neg. emotion assessment (Bagozzi, 1998)	If mastery goal was low, increasing negative affect after first task failure predicted more lower defensive goal setting for a second task, but no relationship when mastery goal high. Relationship between performance avoidance goal orientation and Goal setting in a second task partially mediated by negative affect following failure in first task.	points, reduces bias in ratings. **Limitation:** Unable to partial out potential covariates because of lack of other variable measures.
Hovath & Wambolt, 2010	To examine role of validation seeking goal orientation as self- worth regulator mediating relationship between feedback and affect.	Quasi-Experimental Measure: Other measures, then task, manipulation of feedback, then Measure: Other measures, then Validation seeking measure.	Place of Study: Canada 88 undergrad participants, 68 female 20 males. Sample showed subclinical depressive symptoms (relatively high distress)	**Goal orientation measure:** Measured 'validation seeking' (performance goals) only using GOI. **Other measures:** STAI-anxiety MAACL-R –dysphoria and positive affect (state affect version)	Hierarchical regression analysis suggests Performance goals attenuate effect of feedback on affect;- The DV, anxiety, was significantly higher following IV positive feedback group than negative or neutral feedback condition but only if high on Validation seeking goal, DV (dysphoria sign.) higher in negative feedback group than negative or neutral but only if high on Validation seeking goal orientation.	**Strengths:** Quasi-experimental Includes measure of dysphoria and positive affect. **Limitations:** Validation measured retrospectively, increase confounding effect of affect on memory and recall.
Elliot & Dweck, (1988)	To examine relationship between low and high feedback and goal orientation on negative affect, and performance on tasks	Experimental	Place of study: USA 101 Primary School Children, 57 boys 44 girls	**Goal orientation measure:** Goal orientation manipulated via experimenter induction script and manipulation check. **Other measures:**	Performance goal condition with low ability feedback more likely than either the mastery condition or performance condition with high feedback to (i) choose the simplest	**Strengths**: Pilot study to validate effect of feedback and mastery and orientation. Better control of variables, causal links more valid than correlational to be inferred. Research assistant giving

				Task choice (learning, or high, medium or low proving competence task) Negative verbalisation frequency recorded (negative affect), negative attributional statements recorded (cognitions).	task that offered them the chance of avoiding looking incompetent, avoided challenging task choice or learning opportunity, (ii) produced more negative affect and negative cognitions verbally during a task, and (iii) performed less well.	goal orientation manipulation blind to academic feedback level grouping of participants. **Limitations:** No control group Measure of negative affect and cognitions may be insensitive to true extent felt by participants.

GOI-Goal Orientations Inventory (Dykman, 1998); PSI-II Personal Style Inventory –II; CES-D- Centre for Epidemiological Studies – Depression Scale (Radloff, 1977).STAI-State Trait Anxiety Inventory (Spielberger, 1983) MAACL-R Multiple Affect Adjective Checklist-Revised (Zuckerman & Lubin, 1985) SAIS Striving to Avoid Inferiority Scale (Gilbert, 2007). DASS42 Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995);; WBSI- White Bear Suppression Inventory (Wegner & Zanakos, 1994); ERQ-Emotion Regulation Questionnaire (Gross & John, 2003): PMCSQ – Motivational Climate in Sport Questionnaire (Newton et al., 2000); PALS- Patterns of the Adaptive Life Survey (Midgely & Urdan, 2001)

Results

How has the association between performance goals, mastery goals and depressive affect been researched?

Design

A total of 14 papers were reviewed (See Table 1). Some papers contributed more than one study to the review, and therefore a total of 16 studies were included. Eight papers were cross-sectional correlational studies, four were prospective studies, and two papers had quasi-experimental designs.

Participants

Total sample sizes ranged from 62 participants (Rusk, Tamir, & Rothbaum, 2011) to 1321 participants (Tuominen-Sioni, Salmera-Aro, & Niemivirta, 2008) with the majority of studies samples ranging from 68 to 167 participants. Nine studies recruited undergraduate samples from higher education institutions, five from primary educational settings, and two recruited adolescents from secondary education settings. A further study recruited from a community sample. All of the studies involving undergraduate students and primary school children participants used convenience sampling facilitated either by offering course credit in return for participation or by assessing a whole academic year group or cohort when available, such as during or around lectures and lessons. Four of the studies did not include information sufficient to clarify how they recruited their sample.

Measures

Goal orientation was assessed using nine measures. Eight of the measures were self-report questionnaires or a combination of self-report questionnaire items (Sideridis, 2005, 2007) Choice of measure was depended on the particular goal

orientation construct that was being investigated. The most common, being used in five studies, was the Goal Orientation Inventory (GOI; Dykman, 1998). The other self-report measures included Goal Achievement Items (Elliot & Church, 1997), Achievement Goal Questionnaire (Elliot & McGregor, 2001), 5 - Scales Method (Niemivirto, 2002), VandeWalle's Goal Items (VandeWalle, 2001), as well as adapted scales the Task & Ego in Sport Questionnaire (Duda & Nicholls, 1992), and the Patterns of the Adaptive Life Survey (PALS; Midgely & Urdan, 2001).

Depressive affect was measured using assessments of recent depressive symptoms and state depressive affect. Four studies used the self-report measure, Beck Depression Inventory version II (Beck et al., 1996). The other self-report measures of recent depressive symptoms included the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), Children's Depression Inventory (CDI; Kovacs, 1980), Achenbach Youth Self-Report- Depression Scale (YSR-D; Clarke, Lewisohn, Hops, & Seeley, 1992), and a Depression Screening Instrument (Salokangas, Poutanen, & Stengard, 1995).

State depressive affect was measured using the Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999), Achievement Emotions Questionnaire (AEQ; Pekrun, Goetz, Titz, & Perry, 2002), Negative Emotional Reactions Questionnaire (Bagozzi, Baumgartner, & Pieters, 1998), and the Multiple Affect Adjective Checklist Revised (MAACL-R; Zuckerman, Lubin, & Rinck, 1983). One study measured the frequency of negative verbalisations to assess state depressive affect (Elliot & Dweck, 1988).

Method of analysis

Due to the high proportion of cross-sectional correlational studies in which goal orientation was measured, not manipulated, nine studies employed hierarchical

regression analysis to investigate the predictive relationships between variables tested. Alternatively three studies conducted structural equation modelling to explore the interrelationships between factors (Kaplan & Maehr, 1999; Sideridis, 2005, 2007). All the studies mentioned also examined associations with bivariate correlations. Four studies employed parametric statistics to make between- group comparisons including ANOVA's and t-tests, and one study employed non-parametric methods (chi-square test of significance).

What associations has research found between performance goals and depressive affect?

Having described how the association between goal orientation and depressive affect has been researched, the review will now go on to describe the nature of the relations found by the literature included in this review.

Performance goal orientation (proving one's ability or avoiding proof of one's ability) has been proposed to be an active factor leading to depressive affect, and other depressive symptoms in the presence of stressors as well as a generator of further stressors although no studies reported effect sizes (Dweck & Leggett, 1980; Dykman, 1998; Rothbaum et al.,2009). Six studies reviewed, directly tested the hypothesis that there would be a positive association between performance goals and depressive negative affect and five reported a significant correlation between these factors (Cron et al., 2013; Flett et al., 2014; Lindsay & Scott, 2005; Rusk, Tamir, & Rothbaum, 2009; Travers et al., 2013). One study did not find a significant correlation between performance goals and dysphoric symptoms but did report a significant correlation to a closely associated factor, anxiety (Hovath & Wambolt, 2010).

As correlations provide little information regards the nature of relationships between factors, multiple regression analyses have been used to better understand the association between goal orientations and depressive affect. This data analysis technique is used because it can partial out the influence of other related variables (covariates) that may predict variance in a dependent variable. Applying a multiple regression technique, six studies found performance goals were unique predictors of depressive affect and dysphoria (Dykman, 1998; Flett et al., 2014; Hovath & Wambolt, 2010; Pekrun et al., 2006; Rusk et al., 2011; Travers et al., 2013). One study found that performance goals moderated the relationship between perfectionism and depressive affect (Fleet et al., 2014) whilst another found performance goals moderated the relationship between exam performance and dysphoria in undergraduates (Lindsay & Scott, 2005). In the only experimental study, Elliot & Dweck (1988) employed an experimental design in which, following induction of a belief of low ability, school children induced to adopt a performance goal were shown to verbalise depressive negative affect and negative cognitions significantly more, than children induced to adopt a mastery goal.

Further development of the performance goal construct (Elliot & Church, 1997) has led to dichotomisation into performance avoidance goals (aim to avoid proof of inability and worthlessness) and performance approach goals (aim to prove ability and worthiness). Eight studies found that performance avoidance goals but not performance approach goals were significantly associated with depressive affect and negatively associated with positive affect, hope, and subjective well-being (Cole et al., 2007; Cron et al., 2003; Pekrun, et al., 2006; Rusk et al., 2011; Sideridis, 2005, 2007; Tuominen et al., 2008) using self-report measures. Contrastingly, two prospective studies found no significant differences in depressive symptoms, following a stressor, between participants with performance avoidance goal

orientations and mastery goal orientations (Sideridis, 2005, 2007). Three of the eight studies identified as having investigated performance avoidance and performance approach goals carried out further analysis using multiple regression analyses. Performance avoidance goals were found to be main predictors of depressive affect in all four studies.   In addition the performance avoidance goals predictive relationship with depressive affect was found to be mediated partially by other factors in one study (Rusk et al., 2011). Rusk et al. (2011) aimed to examine the relationship between performance goals for self-regulation, depressive affect, thought suppression, and rumination.   Although no mediation role was found initially, a second study found that performance-avoidance goals, not performance goals as a unitary construct, was a significant main predictor of depressive affect, and this relationship was partially mediated by thought suppression and rumination.

What associations has research found between mastery goals and depressive affect?

Eight studies found that mastery goals were significantly negatively correlated to depressive affect and significantly positively related to positive affect, hope, and enjoyment. Studies employing multiple regression analysis and structural equation modelling have also suggested mastery goals are a unique predictor of depressive affect (Kaplan & Maehr, 1999; Sideridis, 2005, 2007; Tuominen-Soini, Salmela-Aro, & Niemivirta, 2008) and mediates the relationship between a performance orientated environment or 'climate' and depressive affect (Travers et al., 2013) and moderates the relationship between negative affect and future goal setting (Cron, Slocum, VanderWalle, & Qingbo Fu, 2005). This suggests mastery orientation may have an indirect or direct anti-depressive relationship with stressors that can perpetuate depressive negative affect.

In summary, the literature suggests that performance goals, particularly performance avoidance goals, are broadly positively related to, and are main predictors of depressive affect. These findings arose from a range of studies with weaker cross-sectional designs to stronger experimental designs that had more control of confounding variables. A number of covariant factors are implicated in mediating this relationship including expectancy, perceived competence, rumination and thought suppression (Kaplan & Maehr, 1999; Rusk et al., 2011; Sideridis, 2005). Similarly, mastery was found to be negatively related to depressive affect, as well as moderating the relationship between depressive negative affect and future goal setting (Cron et al., 2003).

Strengths and weaknesses of the literature

Despite goal orientation being a difficult construct to assess, partly because it has continually been developed over the past 30 years (see Locke & Lathem, 2013, for a review) a number of well validated and reliable measures have been developed by the literature, in order to measure goal orientation. Many of the studies also had large sample sizes (>200) and therefore were likely to have the power required to detect the medium and smaller effect sizes they were investigating. It is of note that many of the studies originally identified as appropriate for review did not directly test depressive symptoms or depressive affect and had to be excluded from the final review. This may reflect a missed opportunity by researchers to develop the knowledge base between goals and depressive symptoms, two theoretically interrelated concepts.

From the literature included in the review an over-reliance on cross- sectional correlational designs and self-report measures was apparent, with only one experimental method manipulating task goal cited (Elliot & Dweck, 1988). The causal

relationships between goal orientation, and depressive affect were unable to be elucidated. The results of the literature in this review indicated that task goals relationship with depressive affect is mediated by other depression related variables and is also a mediator and moderator of depressive affect's relationship with other factors associated with depression. The research reviewed has not been able to inform our understanding of why the mediation or moderation occurs due to their correlational designs. It may also be possible third variables that have not been controlled for in the research reviewed may be partial or complete mediators/ moderators. Many of the studies note limitations in their study designs that indicate that further research should aim test these constructs using experimental and longitudinal methodologies, or daily measures (experience sampling method, for example), in order to test the specific situational and contextual predictions possible with goal orientation theory and Social-cognitive models of Depression. These studies could investigate whether there are other circumstances under which depressive affect and task goals are associated with each other than stressors such as failure. Rothbaum et al. (2009) predicted this association would occur at times of loss for instance.

A second limitation of the literature was the homogeneity of sample demographics. The majority of studies recruited from students in undergraduate higher education, secondary education or primary educational settings. This may reflect the historical development of goal orientation theory out of educational psychology (Dweck & Deiner, 1978; Kaplan & Maehr, 2007). However despite recent theoretical advances into the clinical realm (Dykman, 1998; Rothbaum et al., 2009) no studies in this review included clinical samples therefore it is difficult to determine whether these associations would apply in clinical populations. In addition other demographic groups have not been researched such as older adults, or adults of

working age not in higher education. Again, only one study reviewed used a community sample.

A further strength of the literature however, was commonality in which many potentially confounding variables (covariates) were measured alongside goal orientation and depressive affect including expectancy, perceived control, and the beliefs about competence in the ability being studied (Sideridis, 2005). These also allowed the potential moderators and mediators of the association between goal orientation and depressive affect to be examined and rule out competing explanations in terms of these covariates.

Lastly, the diversity of the places in which the studies took place was a strength of the literature reviewed and made the consistent findings, particularly that performance goals and performance-avoidance goals, were related to increased depressive affect and symptoms, across many multi-cultural and societal boundaries more powerful and impressive.

Risk of biases in the studies

Overall the risk of bias was low. The main source of bias originated from the recruitment of the sample populations, most of which were convenience samples. Given the motivational nature of the theories being examined the reasons for self-selection without structured sampling methods may risk over representation of particular elements of the sample population. Due to the common cross-sectional design employed by many of the studies included in the review concurrent completion of self-report measures was also prevalent, raising the risk of state factors such as mood state, life stressors, or state rumination (Martin & Tesser, 1996), during the time of testing having undue effects on the results. However, a number of studies employed prospective longitudinal designs in order to reduce this risk.

Some studies also did not report their recruitment methods (Flett et al., 2014). Although data was well reported no studies provided a priori power calculations or effect sizes.

Strengths and weaknesses of this review

This review focused on integrating the literature examining the association between performance and mastery goals orientation and depressive affect. This review drew together interrelationships and findings that may not be noticed or focused upon by other literature. This review was also carried out systematically allowing replication. However weaknesses of the review include potentially being too narrow in the search terms when gathering relevant literature. Due to the wide range of terms used to denote performance and mastery goal orientation this is not a simple task, and it may have been that the review was not able to capture relevant literature. Additionally perhaps if the review also reviewed articles that measured variables related to depressive affect such as self- esteem, and labile self- esteem this may have produced a larger sample of papers from which to review.

Conclusions

This review highlights that there is a large amount of heterogeneity in the terminology used to denote performance and mastery goal orientation which is a barrier to successful synthesis of research in the area. However, a small to average sample of studies relevant to the review were found. They produced consistent findings regards pre-episode and sub clinical depression populations that may be vulnerable to depressive affect, due to the adoption of performance and performance avoidance goals and the lack of adoption of mastery goals. The need for a wider range of design methods and analyses to test causal links between the constructs is highlighted, however, particularly experimental and longitudinal studies from clinical

and community samples with subclinical levels of depression. Further research questions to be addressed include whether goals are able to predict depressive episodes, or whether depressive episodes predict global performance goals (self-worth goals).

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Appendices

Appendix A – Data Extraction Form

Reference Number:

Title:

Author(s):

Source:

Date: **Volume:**   **Pages:**

Aim(s) of the study:

Setting & Geographical Location:

Study Design:

Population

    Population Characteristics (N, TBI severity):

    Method of TBI classification:

    Sampling method:

    Power calculation presented: Y/N   Outcome:

Inclusion Criteria:

Exclusion Criteria:

Control group characteristics:

Measures

Measures used:

Were measures validated?

Results

Method(s) of analysis:

Adequate reporting of data, parametric assumptions:

Emotional Empathy specific results:

Conclusions

Emotional empathy related conclusions:

Strengths of the Study:

Limitations of the Study:

Assessment of Study Quality/Sources of Bias:

   Relevant blinding procedures (if applicable):

   Incomplete outcome data:

   Selective outcome reporting:

   Other threats to validity (e.g. bias from design or recruitment):

Appendix B – The Cochrane Collaboration risk of bias tool

The Cochrane Collaboration's tool for assessing risk of bias

Domain	Description	Review authors' judgement
Sequence generation	Describe the method used to generate the allocation sequence in sufficient detail to allow an assessment of whether it should produce comparable groups.	Was the allocation sequence adequately generated?
Allocation concealment	Describe the method used to conceal the allocation sequence in sufficient detail to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment.	Was allocation adequately concealed?
Blinding of participants, personnel and outcome assessors *Assessments should be made for each main outcome (or class of outcomes)*	Describe all measures used, if any, to blind study participants and personnel from knowledge of which intervention a participant received. Provide any information relating to whether the intended blinding was effective.	Was knowledge of the allocated intervention adequately prevented during the study?
Incomplete outcome data *Assessments should be made for each main outcome (or class of outcomes)*	Describe the completeness of outcome data for each main outcome, including attrition and exclusions from the analysis. State whether attrition and exclusions were reported, the numbers in each intervention group (compared with total randomized participants), reasons for attrition/exclusions where reported, and any re-inclusions in analyses performed by the review authors.	Were incomplete outcome data adequately addressed?
Selective outcome reporting	State how the possibility of selective outcome reporting was examined by the review authors, and what was found.	Are reports of the study free of suggestion of selective outcome reporting?
Other sources of bias	State any important concerns about bias not addressed in the other domains in the tool. If particular questions/entries were pre-specified in the review's protocol, responses should be provided for each question/entry.	Was the study apparently free of other problems that could put it at a high risk of bias?

Possible approach for *summary assessments* outcome (across domains) within and across studies

Risk of bias	Interpretation	Within a study	Across studies
Low risk of bias	Plausible bias unlikely to seriously alter the results.	Low risk of bias for all key domains.	Most information is from studies at low risk of bias.
Unclear risk of bias	Plausible bias that raises some doubt about the results	Unclear risk of bias for one or more key domains.	Most information is from studies at low or unclear risk of bias.
High risk of bias	Plausible bias that seriously weakens confidence in the results.	High risk of bias for one or more key domains.	The proportion of information from studies at high risk of bias is sufficient to affect the interpretation of the results.

Criteria for judging risk of bias in the 'Risk of bias' assessment tool

SEQUENCE GENERATION **Was the allocation sequence adequately generated? [Short form: *Adequate sequence generation?*]**	
Criteria for a judgement of 'YES' (i.e. low risk of bias).	The investigators describe a random component in the sequence generation process such as: • Referring to a random number table; Using a computer random number generator; Coin tossing; Shuffling cards or envelopes; Throwing dice; Drawing of lots; Minimization*. *Minimization may be implemented without a random element, and this is considered to be equivalent to being random.
Criteria for the judgement of 'NO' (i.e. high risk of bias).	The investigators describe a non-random component in the sequence generation process. Usually, the description would involve some systematic, non-random approach, for example: • Sequence generated by odd or even date of birth; • Sequence generated by some rule based on date (or day) of admission; • Sequence generated by some rule based on hospital or clinic record number. Other non-random approaches happen much less frequently than the systematic approaches mentioned above and tend to be obvious. They usually involve judgement or some method of non-random categorization of participants, for example: • Allocation by judgement of the clinician; • Allocation by preference of the participant; • Allocation based on the results of a laboratory test or a series of tests; • Allocation by availability of the intervention.
Criteria for the judgement of 'UNCLEAR' (uncertain risk of bias).	Insufficient information about the sequence generation process to permit judgement of 'Yes' or 'No'.
ALLOCATION CONCEALMENT **Was allocation adequately concealed? [Short form: *Allocation concealment?*]**	
Criteria for a judgement of 'YES' (i.e. low risk of bias).	Participants and investigators enrolling participants could not foresee assignment because one of the following, or an equivalent method, was used to conceal allocation: • Central allocation (including telephone, web-based, and pharmacy-controlled, randomization); • Sequentially numbered drug containers of identical appearance; • Sequentially numbered, opaque, sealed envelopes.
Criteria for the judgement of 'NO' (i.e. high risk of bias).	Participants or investigators enrolling participants could possibly foresee assignments and thus introduce selection bias, such as allocation based on: • Using an open random allocation schedule (e.g. a list of random numbers); • Assignment envelopes were used without appropriate safeguards (e.g. if envelopes were unsealed or non-opaque or not sequentially numbered); • Alternation or rotation; • Date of birth; • Case record number; • Any other explicitly unconcealed procedure.

Criteria for the judgement of 'UNCLEAR' (uncertain risk of bias).	Insufficient information to permit judgement of 'Yes' or 'No'. This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement – for example if the use of assignment envelopes is described, but it remains unclear whether envelopes were sequentially numbered, opaque and sealed.
BLINDING OF PARTICIPANTS, PERSONNEL AND OUTCOME ASSESSORS **Was knowledge of the allocated interventions adequately prevented during the study? [Short form: _Blinding?_]**	
Criteria for a judgement of 'YES' (i.e. low risk of bias).	Any one of the following: • No blinding, but the review authors judge that the outcome and the outcome measurement are not likely to be influenced by lack of blinding; • Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken; • Either participants or some key study personnel were not blinded, but outcome assessment was blinded and the non-blinding of others unlikely to introduce bias.
Criteria for the judgement of 'NO' (i.e. high risk of bias).	Any one of the following: • No blinding or incomplete blinding, and the outcome or outcome measurement is likely to be influenced by lack of blinding; • Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken; • Either participants or some key study personnel were not blinded, and the non-blinding of others likely to introduce bias.
Criteria for the judgement of 'UNCLEAR' (uncertain risk of bias).	Any one of the following: • Insufficient information to permit judgement of 'Yes' or 'No'; • The study did not address this outcome.
INCOMPLETE OUTCOME DATA **Were incomplete outcome data adequately addressed? [Short form: _Incomplete outcome data addressed?_]**	
Criteria for a judgement of 'YES' (i.e. low risk of bias).	Any one of the following: • No missing outcome data; • Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias); • Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups; • For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate; • For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size; • Missing data have been imputed using appropriate methods.
Criteria for the judgement of 'NO' (i.e. high risk of bias).	Any one of the following: • Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups; • For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate; • For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size; • 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomization; • Potentially inappropriate application of simple imputation.

Criteria for the judgement of 'UNCLEAR' (uncertain risk of bias).	Any one of the following: • Insufficient reporting of attrition/exclusions to permit judgement of 'Yes' or 'No' (e.g. number randomized not stated, no reasons for missing data provided); • The study did not address this outcome.

SELECTIVE OUTCOME REPORTING
Are reports of the study free of suggestion of selective outcome reporting? [Short form: *Free of selective reporting?*]

Criteria for a judgement of 'YES' (i.e. low risk of bias).	Any of the following: • The study protocol is available and all of the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way; • The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon).
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Criteria for the judgement of 'UNCLEAR' (uncertain risk of bias).	There may be a risk of bias, but there is either: • Insufficient information to assess whether an important risk of bias exists; or • Insufficient rationale or evidence that an identified problem will introduce bias.

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DOCTORATE IN CLINICAL PSYCHOLOGY

Part 2: Empirical Paper

Relationship between Depressive Symptoms, Performance and Mastery Goals, Rumination and Affect

George Baines

Supervisor: Dr. Nick Moberly

Word count= 8000
(Excluding headings, tables, figures, abstract, appendices and references)

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Abstract

The social cognitive theory of Depression proposed by Rothbaum et al. (2008) integrates theory originating from the motivation, cognitive and rumination literature. Following stressors, those with vulnerable self-beliefs are predicted to adopt performance goals that aim to avoid threats to self-worth, necessitating protective mechanisms like rumination. Both the goals themselves and rumination serve to protect self-worth but are proposed to have depressogenic consequences. This theory, combined with literature on contingent self-worth and trait rumination in depression, led to an elaborated social cognitive model whereby rumination mediates the relationship between goal orientation and depression. The current study aimed to test this model. Seventy two healthy participants participated in an experimental manipulation of goal orientation prior to a difficult anagram task and rated their sadness, anxiety, and state rumination following a stressor and during a subsequent sustained attention task. The results suggested many of the hypotheses about condition differences were not supported and this may have been due to an unsuccessful task goal manipulation. However extrinsic contingent self-worth based on other's approval was found to moderate the effect of goal orientation on task based depressive affect and rumination. For those reporting high contingent self-worth based on other's approval, cuing a performance goal was related to significantly higher sadness and rumination following a stressor than cuing mastery goal. Findings suggest that therapy specifically focusing on assessing extrinsic contingent self-worth and associated vulnerable self-beliefs, and encouraging the adoption of mastery goals may be therapeutically beneficial in making people less reactive to stressful life events.

Introduction

This study examines the influence of task goals on affect and rumination and elaborates on previous models explaining the relationships between goal orientation, negative affect, and rumination.

Explanations of depression have tended to focus on cognitive theories. Abramson, Metalsky, and Alloy (1989) proposed that cognitive vulnerabilities remain latent before and between the onset of depressive episodes. At times of distressing and negative life-events, cognitive vulnerabilities are hypothesised to be activated, precipitating depression (stress-diathesis models). Dykman (1998) proposed weaknesses in the ability of these theories to predict and explain the course of depressive symptoms and depression. Additionally he argued that cognitive theories neglected to integrate explanations for the many personality traits that co-occur with depression, including phenomena such as rumination. Cognitive models of depression have also been criticised for neglecting motivational factors that drive people toward or away from unintentional patterns of behaviour that perpetuate depression (Dykman, 1998; Sideridis, 2005). It has been argued that these motivational explanations of depression may be useful in explaining responses to life events in terms of mood. Klinger drew attention to the pervasiveness of goal pursuit in everyday life and suggested that understanding behaviours and their motivations can contribute to explaining mood and symptoms (Klinger, 1977).

Goal theorists have attempted to differentiate different types of goals employed by humans. General goals describe 'what' we aim to achieve about an aspect of our lives (I want to be happy), while task goals may be thought of as representing one's approach to a defined task (e.g. avoid failure solving anagrams). Diener & Dweck

(1978) proposed two categories of task goals they termed 'mastery' (focusing on developing an ability) and 'performance' goals (focusing on preserving pre-existing abilities). Later work by Elliot and Church (1997) further dichotomised performance goals into avoidance goals (avoid proof of inability) and approach goals (prove ability) goals. These developments in theory enabled Rothbaum et al. (2009) to propose an updated social cognitive model of depression which included clearer elaboration of the relationship between task goals (motivation) and beliefs (cognitions). This model predicts that people with vulnerable self-beliefs tend to either adopt goals to prove self-worth (global performance approach goals), or to avoid proof of worthlessness (global performance avoidance goals). When encountering prolonged stressors, such as failure, they are likely to shift toward performance avoidance goals, causing them to behave in ways which perpetuate depression. Based on prior work by Dweck and colleagues (Dweck, 1999) and Dykman (1998) Rothbaum's model proposed that mastery goals, whereby one aims to learn grow and improve one's ability, can alleviate depression by reducing the drive for self-assessment.

Rumination was defined as conscious thoughts that revolve around an instrumental theme and occur in the absence of environmental demands that would require it (Martin & Tesser, 1996). It was hypothesised to have a specific function in Rothbaum et al.'s (2009) model of depression. According to Rothbaum et al. (2009), rumination was predicted to occur when individuals aim to avoid proof of worthlessness (i.e., adopt performance avoidance goals) in a context where threats to self-worth are present. The role of rumination suggested by Rothbaum et al. (2009) was to protect self-worth by enabling a process to occur where justifications for one's avoidance motivation and avoidance behaviours are focused on, at the cost of sacrificing successful performance, and preventing attainment of desired outcomes.

Individuals adopting performance avoidance goals may make constant checks to see whether they are failing, and repetitively assess their strategy for dealing with any threats that they perceive. Such arguments predict why performance-avoidance goals would lead to rumination, as will now be elaborated.

Control theories propose why and how rumination is initiated (Carver & Scheier, 1998; Martin & Tesser, 1996). They argue that if an individual perceives a discrepancy between where one wishes to be in regard to obtaining a goal and where one perceives themselves to currently be, this will trigger rumination. Experimental studies have provided evidence that cueing an unresolved goal produces self-focused rumination (Roberts, Watkins, & Wills, 2013). Rumination is hypothesised to recede when an individual does something to diminish this discrepancy or abandons their desired goal (Martin & Tesser, 1996). If an individual continues to ruminate, and achieves progress, it can be helpful (Watkins, 2008). But if it is unconstructive, serving only to increase discrepancy salience and to maintain goal discrepancy, depression results.

Despite these theoretical arguments, rumination's association with task goals has scarcely been researched empirically.

This study aimed to examine the role of task goals in depression. Task goals were chosen in this experimental design because they were more easily manipulated than general goals which are seen as dispositional. This study was interested in the potential role of task goals as an instigator or inhibitor of negative emotional states that precipitate other depressive symptoms and therefore this experiment will measure state depressive symptoms such as sadness and anxiety and rumination which may be transient in nature. The sustained attention to response task (SART; Roberts, et

al., 2013) is a tool that has been used to capture momentary changes in state mood and state rumination and was therefore employed by this study.

The study uses an analogue sample because it aims to investigate the processes that are active pre-depressive episodes. Further, using this sample is a useful initial step to later clinical research and much of the research on which the study builds has taken a similar approach.

Research Aims and Hypotheses

The current study aims to investigate the effect of experimentally cued performance and mastery goals on state rumination, depressive symptoms, and affect in relation to a proposed model. This model is an elaboration of Rothbaum's model, and Martin and Tesser's (1996) Control Theory (See Appendix R).

Firstly it proposes that the adoption of performance goals will be likely to precipitate negative mood states and defensive strategies (state rumination), when faced with a stressor (i.e. goal failure) in a meaningful domain (i.e. academic competence) in which one holds vulnerable self-beliefs (fixed, global and contingent to self-worth). The adoption of mastery goals is expected to produce significantly less negative affect and less rumination compared to the performance goal condition. In this study, participants received a manipulation script, similar to those used by other goal orientation researchers (Elliot & Dweck, 1988) intended to encourage them to perceive a series of tests as predictors of their future academic performance and competence as well as inducing either a performance avoidance goal (Performance condition, PG) or a mastery goal (Mastery condition, MG).

Therefore, Hypothesis 1 predicts those induced with PG will report significantly higher levels of sadness, and anxiety than those induced with MG following feedback

of low ability on an anagram task (stressor) and after the SART. Hypothesis 2 predicts that PG will report significantly more state rumination than MG following anagrams.

As has been shown in other research (Roberts et al., 2013), hypothesis 3a predicts participants will ruminate significantly more in the first half than the second half of the SART as the effect of the stressor on rumination recedes over time. Consistent with Rothbaum's theory of rumination, Hypothesis 3b predicts that PG will ruminate significantly more than MG during the first half of the SART.

Hypothesis 4 predicts PG will report significantly greater levels of sadness (mood), and anxiety (tenseness) than MG during the SART because the effects postulated by H1 will be prolonged, as rumination fuels negative mood.

Consistent with previous research (Elliot & Dweck, 1988) Hypothesis 5 predicts PG will be significantly more likely to choose to avoid challenging anagrams as a third hypothetical task, compared to the MG.

Lastly, the model proposes that pre-existing beliefs that see a specific ability or trait as contingent for self-worth (CSW) are a necessary component of vulnerable self-beliefs (Rothbaum et al., 2009) which are a predisposing factor to depression. Consistent with this, RST (Nolen-Hoeksema, 1991), and contingent self worth theory (Crocker & Park, 2004), Hypothesis 6 predicts that extrinsic CSW (CSW Approval from Others), CSW Academic Competence and trait rumination will moderate the relationship between participants induced goal during manipulation and outcome variables including state mood, and state rumination in the direction of greater negative outcomes for the performance group than the mastery group.

Method

Participants[1]

Seventy two participants took part in this study, 10 males and 62 females. Participants had a mean age of 19.1 years, SD = 1.12, range = 18-24. This sample was recruited from the university student population via the student online psychology research participation system (SONA). Course credits were granted as a result of participation. Participants were required to be aged 18 and above. In addition, participants currently experiencing severe symptoms of depression were excluded because it would be unethical to induce the distress that difficulty completing the tasks of the experiment could produce in this population. Those with severe depression were identified as scoring 20 or above on the Patient Health Questionnaire-9 (PHQ-9). Participants were also required to be native English speakers.

Ethical approval was obtained from the University of Exeter Ethics Committee, prior to data collection (in appendix H)

Design

The study was a mixed design with a between subject factor of condition (performance goal vs. mastery goal) and a repeated-measures factor of time (pre-testing, pre- sustained attention response time task (SART), during SART, post SART).

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[1] For sample size calculations see Appendix B

Measures and materials

Pre-experimental measures

Depressive symptoms: Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a nine item self-report measure assessing a person's mood over the previous 2 weeks. The items are consistent with DSM-IV criteria for depression. Participants were asked to indicate on a four point scale from 0 'not at all' to 3 'nearly every day' how much each item had bothered them over the last two weeks. It has been shown to be a reliable and valid measure of depression (Kroenke, Spitzer, & Williams, 2001). Cronbach's alpha for the nine PHQ-9 items suggested high internal reliability (α = .81).

Trait rumination: Ruminative Responses Scales of the Response Styles Questionnaire

(Short version of the RRS-RSQ (Nolen-Hoeksema & Morrow, 1991)

The short version of the RRS-RSQ is a 10 item self-report measure of the tendency for an individual to ruminate. Rumination is defined as dwelling repetitively on the causes and consequences of sad mood. The measure includes 5 brooding and 5 reflective items, taken from the original full 22 item RRS-RSQ. Respondents indicate how often they engage in 10 ruminative thoughts and behaviours when they feel sad, blue or depressed. They rate each item using a scale from 1 (almost never) to 4 (almost always). To get an overall score the items are summed, with higher scores indicating a higher tendency for traits of depressive rumination. This scale has high internal consistency, acceptable construct validity, and good test-retest reliability (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Cronbach's alpha suggested high

internal reliability for the five brooding items (α = .74), and five reflection items (α = .83) as well the ten items combined (α = .84).

Self-worth: Contingencies of Self-Worth Scale (CSW, See Appendix G):

This is a 30 item self-report measure that focuses on six domains hypothesized to be important internal and external sources of self-worth in previous research and theory: others' approval, physical appearance, outdoing others in competition, academic competence, family love and support, and being a virtuous or moral person. Cronbach's alpha suggested high internal reliability for the five items corresponding to the domains of CSW 'Other's Approval' (α = .73), 'Competition' (α = .82), 'Physical Appearance' (α = .77), and 'Academic Competence' (α = .80), and moderate internal reliability for 'Virtue' (α = .67), and 'Family Support' (α = .65).

Experimental manipulation and anagram task

Participants were randomly split into two equal-sized conditions. In condition 1, participants were presented with the performance manipulation instructions[2] on the computer, before the anagram task. After being given a short time to read them, they then heard them read out by the experimenter:

In condition 2 participants were presented with mastery manipulation instructions[3] on the computer, before the anagram task. After being given a short time to read the instructions, they then heard them read out by the experimenter:

The manipulations were designed to induce particular goal orientations (Dweck, 1999).   The performance manipulation was designed to induce a performance avoidance goal, whereby participants attempt to avoid performing poorly thereby

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[2] See Appendix N for 'performance' goal manipulation script.

[3] See Appendix N for 'mastery' goal manipulation script.

avoiding looking academically incompetent or avoiding being outdone by their peers. The mastery manipulation was designed to induce a mastery learning goal, whereby participants attempt to develop their abilities in a particular domain, in this case academically.

The subsequent anagram task included 15 anagrams. Participants were asked to complete anagrams that previous student populations (e.g., Watkins, Moberly, & Moulds, 2008) had consistently found to be very difficult. An example of a difficult anagram was 'yambl', which had the low frequency word solution 'balmy'. This level of difficulty increased the chances that participants, likely invested in their academic ability, would be challenged by getting many of the answers incorrect. Challenge to their academic ability was proposed to increase the possibility of rumination (Watkins, Moberly, & Moulds, 2008). In order that participants got a sense that the task was possible and that they were able to develop their ability to improve the percentage of anagrams they solve, a smaller number of easier anagrams was randomly interspersed with the difficult anagrams, such as the anagram 'tinga' and its solution 'giant'. The correct answer followed each anagram presented. They were given 20 seconds to complete each anagram. As feedback, the percentage of the anagrams solved so far was provided by the computer programme to participants following each anagram item.

Sustained attention to response task (SART; Robertson, Manly, Andrade, Baddeley & Yiend, 1997)

The modified SART is a shortened version of that presented by Roberts, Watkins, and Wills (2013). SART items are relatively undemanding and high in repetitiveness. Participants therefore engage in the assessment for long periods of

time without being cognitively occupied or consumed by the task. This creates optimal conditions for participants to think about other things out of context, whilst completing the assessment (state rumination). The high propensity for participants to ruminate during the SART enables this assessment to be sensitive to quantitative and qualitative differences in state rumination and state mood between groups of participants who have been subject to different experimental conditions. Roberts et al. (2013), for example, used the SART to investigate the differential effect of experimentally manipulating the participants' type of personal goal (unresolved and resolved goals) on state rumination and mood. Having been shown to be a valid and reliable assessment for investigating the effects of different types of personal goals on state rumination, and state mood, the SART was used in the current study to investigate the effects of different task goals.

Participants were presented with 900 neutral words (trials). Each word was presented individually for 300 ms followed by 900ms during which the word was masked. For the majority of trials, when the word was presented in lower-case, the trials required participants to respond to the word by pressing the spacebar (GO TRIALS). On a minority of trials (NOGO TRIALS), when the word was presented in uppercase, participants were required to withhold their response.

The task comprised two blocks. Each block presented 450 trials consisting of 45 words repeated ten times in a different order. Within each set of 45 words, 5 uppercase words appeared at random times within the sequence of 40 lowercase words. No discernible break was given between each block.

Participants were randomly (following 66% of no-go trials within each block) probed regarding the focus of their attention immediately prior to the probe.

Participants were asked to select from six responses, which were explained before the task, to indicate what they were thinking just before the probe. These options were:

(a) SART task (i.e., the stimuli or appropriate response)

(b) SART task performance

(c) Current physical state (i.e., conditions such as hunger or sleepiness)

(d) The previous anagram task (our index of state rumination)

(e) Other personal worries that were not connected to the problem identified in the previous task.

(f) Other thought types.

Following each thought probe, participants were asked to indicate on three computerised bipolar scales ranging from 0 to 9 their mood, with '0' representing 'very happy' and '9' representing 'very sad', tenseness, with '0' representing 'very calm' and '9' representing 'very tense', and ruminative self-focus, with '0' representing 'not at all focused on myself' and '9' representing 'extremely focused on myself'.

Negative affect measurement using bipolar computerised scales

Sadness and anxiety was assessed pre-testing, post -Anagram task, and post -SART task to index changes in emotional response to the goal orientation manipulation. To assess sadness, participants were presented with the following question, "To what extent are you currently feeling sad?". To assess anxiety participants were presented with the following question: "To what extent are you currently feeling anxious?" The participants reported their current levels of state sadness and state anxiety using bipolar computerised scales ranging from 0 meaning 'not at all' to 9 meaning 'extremely'. Scales with this format have been found to be

reliable and sensitive measures of current mood and self-focus (Watkins & Teasdale, 2001, 2004).

State rumination measurement using bipolar computerised scales

State rumination was assessed post-anagram task using three question items[4]. Participants reported their current levels of state rumination using bipolar computerised scales ranging from 0 meaning 'not at all' to 9 meaning 'extremely'.

Scales with this format have been found to be reliable and sensitive measures of current mood and self-focus (Watkins & Teasdale, 2001, 2004).

Manipulation check using bipolar computerised scales

Goal orientation in the anagram test was assessed post anagram task to provide a manipulation check. The degree to which participants adopted a performance goal orientation or a mastery goal orientation was assessed using four question items using bipolar computerised scales ranging from 0 meaning 'not at all' to 9 meaning 'extremely'[5]. 2 questions assessed performance orientation and two assessed mastery orientation.

The participants reported their goal orientation toward the anagram task.

Scales with this format have been found to be reliable and sensitive measures of goal orientation (Elliot & Church, 1997).

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[4] See Appendix O to view State Rumination items.

[5] See Appendix O to view manipulation check items.

Procedure[6]

Participants initially expressed an interest in taking part in the study by booking a time slot via the student online psychology research participation system (SONA). Trait rumination and contingent self-esteem questionnaires were sent out via email, which participants were asked to complete and return either via email or on the day of the test session. Where participants failed to return these via email or on the day, they were asked to complete them before testing could begin.

Participants were provided with a study information sheet and consent form at the start of the testing session. Having consented, participants were then asked to fill in the patient health questionnaire (PHQ-9) as an assessment of depressive symptoms. Participants scoring below 20 proceeded to the testing stage of the experiment. Those scoring 20 or more were excluded from further participation.

To begin the computer based testing, participants completed the pre-testing state sadness and anxiety scales.

The next stage involved experimental manipulation in order to induce either a performance or mastery goal (See 'Experimental manipulation' section above). Participants were randomised into either the performance or mastery condition. Participants were then asked to complete a small sample of items from the SART as a practice task, the purpose of which was to prevent subsequent instructions providing a distraction from rumination induced by the preceding anagram task. No thought probes, or mood and self-focus questions were included in this practice task. This was followed by a reiteration of the goal manipulation before participants were prompted to

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[6] See Appendix C for procedure flowchart

begin the computerised anagram test. The verbal instructions provided prior to the anagram task were:

"You'll be asked to do a series of tests. Follow the instructions on the computer for each task. The first task will require that you solve anagrams. A combination of letters will appear on the screen. Rearrange the letters to make a word. You'll have 20 seconds to solve each one. Do you have any questions? (proceed when appropriate) When you are ready, follow the instructions on the screen to begin."

Following the anagram task, participants were asked a number of questions to assess state rumination, current sadness, current anxiety, and lastly, their goal orientation towards the anagram task which served as a manipulation check.

Having read a brief explanation of the SART and re-iteration of the goal manipulation, participants then completed the SART which is explained in the previous section. At the end of the SART task participants were required to complete a final two mood questions assessing sadness and anxiety using computerised bipolar scales.

After completion of the SART task, participants were then prompted to choose their third task, using the following script:

"For a final task you have a choice of two activities. Your first option is to do the anagram task you did before. If you choose to do this you are likely to make mistakes and get things wrong, but it may allow you to improve your performance and to develop and learn skills. The other activity would be novel to you. It is just as difficult as the anagram task and you're just as likely to make mistakes. You may find it more interesting, but it will not affect the results from your previous tasks because we believe it assesses other cognitive skills and abilities."

Once the choice had been made they were told that they did not need to complete another task, as the experimenter was only interested in the choice that they made. Participants were asked to listen to a recorded relaxation script and to follow the instructions of the speaker if they wished (see Appendix T for relaxation script). Participants then received a verbal debrief, which fully explained the nature of the manipulation used (see Appendix K). Participants were given an opportunity to ask any questions they had about the research.

Results[7]

Preliminary analysis

Exclusion of participants. Four of the original 72 participants who took part in the study were excluded from data analysis due to reporting an abnormally high level of confidence in their performance during the anagram task (more than 2 standard deviations above mean in perceived anagram performance). Reported high confidence was taken to suggest the anagram task had not achieved its aim to instil a perception of failure/ poor performance on this task. A perception of failure/ poor performance is theoretically required for participants to adopt avoidance self-worth goals and therefore essential to test the study's main model and hypotheses (see Appendix R).

Demographics for each of the experimental conditions. Participants were randomised into either the performance or mastery condition. Following exclusion of four participants from the analysis (see above) there were 34 participants, allocated to each of the two experimental conditions. Age of participant, trait rumination, six

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[7] For expanded preliminary analysis results section including assumptions of normality, Manipulation checks and incidental checks, see Appendix M.

dimensions of contingent self - worth, and trait depression were examined to assess equivalence of the induced 'mastery' vs. 'performance' goal conditions and there were no significant differences between conditions for any of the variables. Descriptive statistics are shown in appendix P.

Manipulation check. There were no significant differences found between the conditions of induced mastery goal ($M = 8.92$, $SD = 4.35$) vs induced performance goal ($M = 9.8$, $SD = 4.56$) for self-rated performance goal orientation, $t(58) = 1.07$, $p = .29$. There were no significant differences found between mastery ($M = 11.79$, $SD = 4.0$) and performance ($M = 12.4$, $SD = 3.1$) conditions for self-rated mastery goal orientation, $t(58) = 0.44$, $p = .67$. Analysis of the manipulation check items, therefore, suggested there was no evidence that the goal manipulation had been successful. For more detail see Appendix M [8]. However, because self-reported goal orientation using the manipulation check items designed for this study may not be sensitive to all the effects of the manipulation it was decided to continue with the planned analysis.

Main Analysis

Hypothesis 1

Two separate mixed 2 X 3 ANOVAs were conducted to compare reported sadness and anxiety of participants in both mastery and performance conditions pre-testing (T1), post the first experimental anagram task (T2), and at the end of testing following the second SART task (T3). There was a significant main effect of time on sadness rating, $F(2,132) = 37.36$, $p < .001$. Post hoc comparisons, corrected using a Bonferroni adjustment, indicated that participants' mean ratings of sadness were significantly higher following the anagram task ($p < .001$, $M = 3.35$, $SD = 1.83$) and after the SART task ($M = 2.72$, $SD = 1.51$; $p < .001$) than the mean rating of sadness

prior to the anagram task (M = 1.75, SD = 0.92). Participants' mean ratings of sadness following the end of the anagram task were significantly decreased (p = .006) at the end of the secondary SART task. There was no main effect of goal manipulation on ratings of sadness, F (1, 66) = 0.17, p = 0.68. There was no significant interaction effect of time x goal manipulation on sadness rating, F (2,132) = 1.15, p = 0.32. This suggests there was no significant change in reported sadness between conditions over time (T1, T2, or T3).
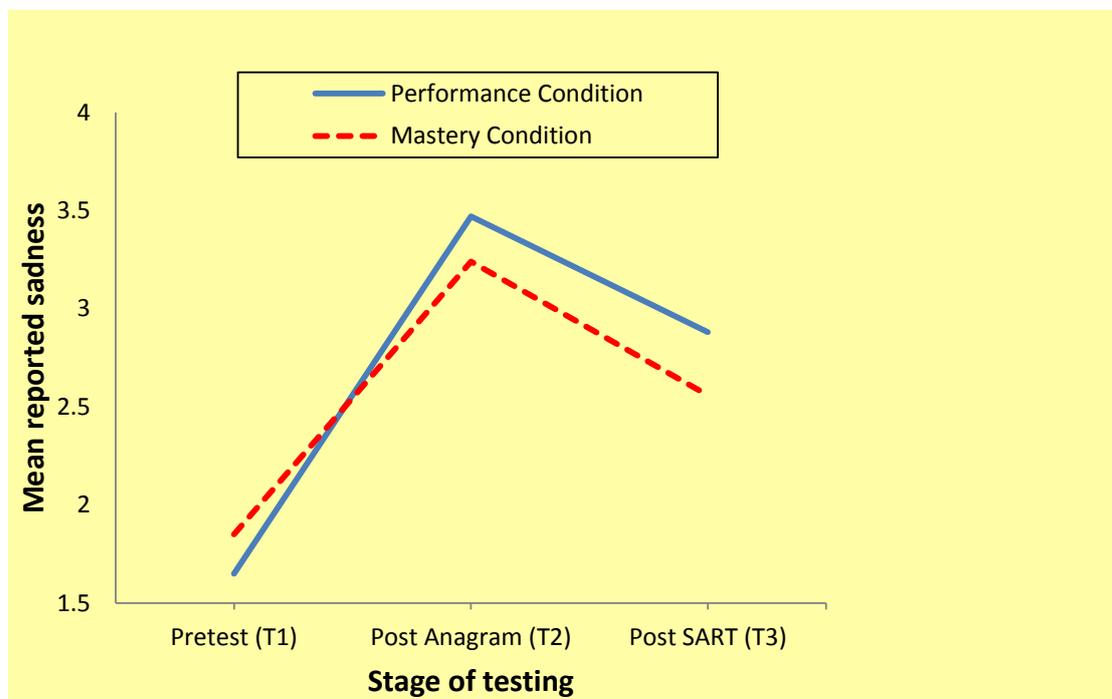
Figure 1. Mean ratings of sadness of all participants at pre-testing (time 1), post- anagrams, the first experimental task, (time 2), and post- SART, the second experimental task (time 3) for the performance and mastery goal conditions.

There was a significant main effect of time on anxiety rating, F(1.79, 118.4) = 23.11, p < .001. Post hoc comparisons, corrected using a Bonferroni adjustment test indicated that participants' mean ratings of anxiety were significantly higher following

the anagram task ($p < .001$, $M = 3.49$, $SD = 2.11$) and after the SART task ($p < .001$, $M = 2.82$, $SD = 1.49$) than prior to either of the experimental tasks ($M = 2.03$, $SD = 1.26$). Participants' mean ratings of anxiety following the end of the primary anagram task were significantly decreased ($p = .011$) compared with at the end of the secondary SART task. There was no main effect of goal manipulation on ratings of anxiety, $F(1, 66) = 0.81$, $p = .37$. There was no significant interaction effect of time X goal manipulation on anxiety rating, $F(1.79, 118.4) = 1.49$, $p = .23$. This suggests that there was no significant change or difference in reported anxiety between each of the conditions over time (T1, T2, and T3).
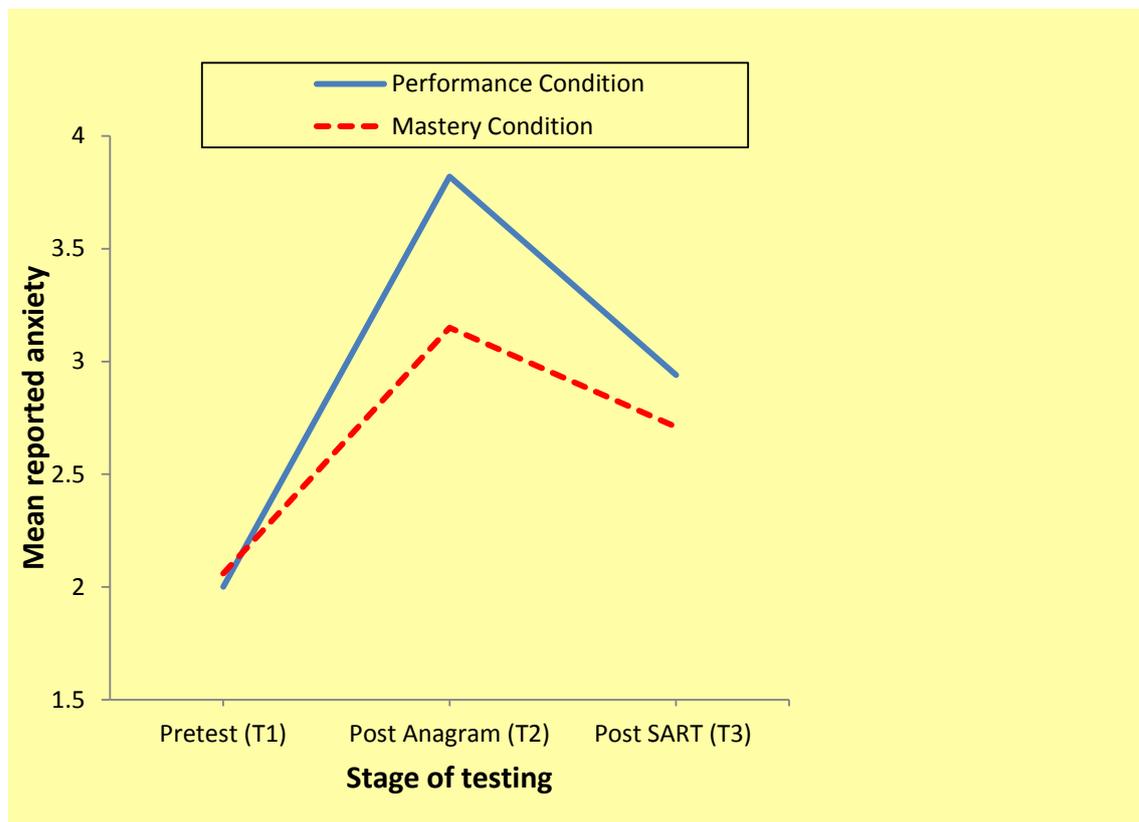
Figure 2. Mean ratings of anxiety of conditions 'PG' and 'MG' at pre-testing (time 1), post- anagrams, the first experimental task, (time 2), and post- SART, the second experimental task (time 3).

These results indicate no significant change between the PG and MG groups in sadness or anxiety during the time of testing. There was also no main effect of group and therefore no significant difference in anxiety or sadness between the PG and MG groups. Lastly there were significant differences in reported sadness and anxiety between T1, T2 and T3, with participants reporting more sadness and anxiety at T2 than T1 or T3 and reporting more sadness and anxiety at T3 than at T1. These results suggest Hypothesis 1 was not supported.

Hypothesis 2[8]

The effect of goal manipulation on reported state rumination (the mean ratings of the three state rumination questions) after the anagram task was assessed using an independent t-test. There was no significant difference found between the performance ($M = 19.79$, $SD = 4.39$) and mastery ($M = 20.00$, $SD = 4.63$) conditions for state rumination $t(66) = - 0.19$, $p = .85$. This suggests Hypothesis 2 was not supported because there was no significant effect of goal manipulation on the state rumination of participants after the anagram task.

Hypothesis 3a and 3b

A 2x2 mixed ANOVA was conducted to assess the effect of the study's goal manipulation on the frequency of intrusive thoughts about the anagram task reported in the first half (H1) and second half (H2) of the SART task. The stage of the SART (H1 and H2) was the within-subjects factor and the goal manipulation (PG or MG) was the between-subjects factor. There was no main effect of goal manipulation found for intrusive thoughts during the SART, $F(1, 66) = .17$, $p = .68$, $\eta p^2 = .01$. These results

[8] Cronbach's alpha for the three questions assessing state rumination that followed the anagram task suggested they had high internal reliability ($\alpha = .75$) and therefore we can assume that the questions tested a unitary concept. This suggests the three questions were assessing the related concept of state rumination.

suggest there was no significant difference between the intrusive thoughts reported by PG (M = 1.03, SD = 2.04) and MG (M = .82, SD = 1.00). There was a main effect of time of SART, F (1, 66) = 6.80, p = .01, ηp^2 = .09. For the whole participant sample, there was a significant decrease in intrusive thoughts from the H1 (M = .60, SD = .96) to H2 of the SART task (M = .32, SD = .85). There was no significant interaction effect between goal manipulation X stage of SART, F (1, 66) = .17, p = 0.68. This suggests there was no change in the difference between the PG and MG over the time of the SART on participants' reports of intrusive thoughts.

Participants answered an anagram check question following the SART. They were asked to indicate the extent to which they thought about the anagram task whilst carrying out the SART. An independent t-test compared the responses of the MG and PG groups on the anagram check question. There was no significant difference found between the responses of the PG (M = 3.15, SD = 1.97) and MG (M = 3.09, SD = 1.93) conditions on the anagram check, t(66) = .12, p = .90. These results suggest Hypothesis 3a was supported but 3b was not.

Hypothesis 4

A 2 x 2 mixed ANOVA was conducted to assess the effect of the study's goal manipulation on ruminative self-focus reported in the first half (H1) and second half (H2) of the SART task. The stage of the SART (H1 and H2) was the within subject factor and goal manipulation (PG and MG) was the between subjects factor. The predicted interaction between goal manipulation, and stage of SART was not significant, F(1, 66) = .002, p = .969. There was no significant main effect of goal manipulation, F(1, 66) = .41, p = .53, nor stage of SART, F(1, 66) = .47, p = .49.

A similar ANOVA was conducted to investigate effects on participants' mood ratings. The predicted interaction between goal manipulation, and stage of SART was not significant, $F(1, 66) = 3.18$, $p = .08$. There was no significant main effect of goal manipulation, $F(1, 66) = .60$, $p = .401$, but there was a significant main effect of stage of SART, $F(1, 66) = 9.23$, $p = .003$. This suggests participants reported a significant increase in sadness from the first half ($M = 3.59$, $SD = 0.13$) to the second half ($M = 3.76$, $SD = 0 .14$) of the SART.

An equivalent ANOVA was conducted to investigate effects on the participants' anxiety (Tenseness). The predicted interaction between goal manipulation, and stage of SART was not significant, $F(1, 66) = 1.17$, $p = .28$. There was no significant main effect of goal manipulation, $F(1, 66) = .56$, $p = .46$, nor a main effect for the stage of the SART, $F(1, 66) = 1.59$, $p = .21$.

The results suggest that there was no significant difference between MG and PG, nor a change in the difference between them over the first to the second half of the SART.

Hypothesis 5

An overwhelming majority of 94% PG participants and 97% of MG participants chose to do an alternative task rather than further anagrams. Only two participants (6%) in the PG and one participant (3%) of the MG chose to repeat the anagram task with new items. The predicted effect of goal manipulation on task choice was not significant ($p = .50$, Fisher's Exact Test).

Hypothesis 6

To explore hypothesis 6, a series of moderation multiple regression analyses were conducted, with the dependent variables being Post anagram sadness ratings, state rumination post anagrams, SART sadness, self-reported rumination (self-focus), intrusive ruminative thoughts reported during the SART, and ruminative thought check about the anagram task post SART. In order to control for alternate explanatory variables, age, gender, initial sadness (T1), and perceived performance on the anagram task were entered as predictors into step 1 of the model. Goal manipulation and contingent self-worth were predictors for step 2, and goal manipulation x contingent self-worth as the predictor for step 3. The majority of the moderation multiple regression results were not significant. The significant models will be reported below. Tests of 'regions of significance' were used to interpret significant interactions between moderators and the predictor variable[9].

Table 2

Summary of Regression Analysis for Hypothesis 6: Intrusive Ruminative Thoughts Reported During 1ˢᵗ Half SART

Variable	B	$SE\ B$	β
Step 1			
Constant	3.71	3.60	
…..Age	-.17	.19	-.11
…..Gender	-.20	.58	-.04
…..Initial Sadness (T1)	.45*	.22	.25*
Step 2			
Constant	26.01	2.68	
Goal Manipulation	3.29	1.90	-.11
CSW Acad.	$-1.40^{†}$	2.48	$.22^{†}$

[9] For a detailed explanation of 'tests of regions of significance' see Appendix S

Comp.			
Step 3			
Constant	3.33	3.44	
Goal Manipulation	-.36	.38	-.11
CSW Acad. Comp	1.02**	.35	.48**
Condition x CSW Acad. Comp	-1.09*	.50	-.36*

Note R^2 = for Step 2 (p = .121); ΔR^2= for Step 3 (p = .03). ** *p<.01,* * *p<.05*

The change in R^2 between step 2 and step 3 was significant (see table 2), with a significant interaction between Manipulation and CSW Academic Competence being found in terms of their effect on ruminative thoughts reported during the SART, $F(1,61)$= 4.79, p = .03. For intrusive ruminative thoughts reported during the SART, tests of regions of significance (Aiken & West, 1991) found, at values of .51 (CSW Academic Competence score ≥ 5.88) the effect of manipulation was significant with PG reporting higher levels of ruminative thoughts reported during the SART than the MG. The direction of the effect was found using the simple slopes technique. There were no significant effects of manipulation found for CSW Academic Competence below 5.88.

Table 3

Summary of Regression Analysis for Hypothesis 6: Ruminative Thoughts During SART

Variable	*B*	*SE B*	*β*
Step 1			
Constant	3.71	3.60	
…..Age	-.17	.19	-.11
…..Gender	-.20	.58	-.04
…..Initial	.45^t	.22	.25^t

Sadness.

    Step 2

Constant	2.67	3.66	
Goal Manipulation	-.30	.40	-.09
CSW Approval	.30	.22	.17

    Step 3

Constant	4.56		
Goal Manipulation	-.26	.39	-.08
CSW Approval	.89*	.34	.50*
Condition x CSW Approval	-.98*	.44	-.43*

Note R^2 = for Step 2 (p = .27); ΔR^2 = for Step 3 (p = .03). ** $p < .01$, * $p < .05$

When equivalent analysis was done with CSW Approval of Others as the outcome variable (See Table 3), the change in R^2 between step 2 and step 3 was significant, with a significant interaction between Manipulation and CSW Approval from Others being found in terms of their effect on ruminative thoughts during the SART, $F(1,61)$ = 5.01, p = .03. Using tests of regions of significance, at values of .76 (CSW Academic Competence score ≥ 5.57) the effect of manipulation on ruminative thoughts during the SART was significant with those in the performance group reporting higher levels of ruminative thoughts during the SART than the mastery group. The direction of the effect was found using the simple slopes technique. There were no significant effects of manipulation found for CSW Academic Competence below 5.57.

Thus, it appears that there may have been significant differences between the groups for ruminative thoughts during the SART only for individuals with higher levels

of Contingent Self Worth 'Approval from Others', and 'Academic Competence'.   No

other moderation effects were found for CSW variables on state ruminative post-

anagrams, or ruminative thoughts and self- reported rumination during the SART[110].

Table 4

Summary of Regression Analysis for Hypothesis 6: Post-Anagrams Sadness

Variable	B	$SE\ B$	B
Step 1			
Constant	3.71	3.60	
…..Age	-.17	.19	-.11
…..Gender	-.20	.58	-.04
…..Initial Sadness.	$.45^{†}$	.22	$.25^{†}$
Step 2			
Constant	2.67	3.66	
Goal Manipulation	-.30	.40	-.09
CSW Approval	.30	.22	.17
Step 3			
Constant	4.56		
Goal Manipulation	-.26	.39	-.08
CSW Approval	.89*	.34	.50*
Condition x CSW Approval	-.98*	.44	-.43*

Note R^2 = for Step 2 (p = .40); $ΔR^2$ = for Step 3 (p < .01). ** *p < .01,* * *p < .05,*

---

[10] [1] Hierarchical regression analysis revealed trait rumination (brooding and reflection subscales) and CSW Competition significantly predicted sadness and anxiety post anagrams and post SART. Only trait brooding and CSW Competition, not trait reflection significantly predicted self-reported state rumination post anagrams and during the SART. For these calculations see Appendix Z.

As can be seen in Table 4 the change in R^2 between step 2 and step 3 was significant, with a significant interaction between Manipulation and CSW Approval from Others being found in terms of their effect on Post Anagram Sadness, $F(1, 61) = 8.34$, $p = .005$. Tests of the region of significance were then used to explore the regions of significance for the interactions. For CSW Approval from Others, at values below -1.72 (CSW Approval scores of between 0 and 3.09) the effect of condition was significant ($p = .005$) in the direction of higher levels of sadness post anagrams in the mastery group, and at values of and above 0.29 (CSW Approval score ≥ 5.1) the effect of manipulation was significant in the direction of higher levels of sadness post-anagrams in the performance group. There were no significant effects of condition found for post anagram sadness scores between 3.10 and 5.09. The direction of the effect was found using the simple slopes technique.

This suggests that MG participants reported significantly higher sadness than PG if their CSW Approval was low and at medium and high levels of CSW Approval this relationship was inverted and PG participants reported significantly higher sadness than MG.

Table 5

Summary of Regression Analysis for Hypothesis 6: 1st Half SART Sadness

Variable	*B*	*SE B*	*B*
Step 1			
Constant	1.38	2.29	
…..Age	.09	.12	.09
…..Gender	-.01	.37	-.01
…..Initial Sadness.	.33	.14	.28
Step 2			

Constant	.48	2.58	
Goal Manipulation	-.16	.26	-.08
CSW Approval others	.11	.14	.10
Step 3			
Constant	-.06	2.53	
Goal Manipulation	-.13	.25	-.26
CSW Approval others	.45	.22	.40
Condition x CSW Approval others	-.57*	.29	-.39*

Note R^2 = for Step 2 (p = .59); ΔR^2 = for Step 3 (p = .05). ** *p < .01, * p < .05,*

The change in R^2 between step 2 and step 3 was significant (see table 5), $F(1, 61)$ = 4.01, $p = .05$, and there was a significant interaction between Manipulation and CSW Approval from Others found in terms of their effect on Mood during SART 1st half. Tests of the region of significance were then used to explore the regions of significance for the interactions. For CSW Approval from Others, at values of 1.32 (CSW Virtue scores of 6.14 and above) the effect of manipulation was significant ($p = .05$) in the direction of lower levels of Sadness during SART in the MG than the PG. There were no significant effects of manipulation, for those scoring 5.8 or below in CSW Approval from Others, found for sadness scores in the 1st half of the SART.

The results suggest hypothesis 6 was partially supported. The effect of goal manipulation was moderated by CSW Approval from Others on three outcome variables and to a lesser extent by CSW Academic Competence on one outcome variable. No evidence for trait rumination as a moderator was found. PG participants scoring above the samples mean average in CSW Approval from Others, reported

significantly more ruminative thoughts during the SART, more sadness post-anagrams, and more sadness during the 1st half of the SART than MG participants who scored above average in CSW Approval from Others. MG participants scoring below average CSW Approval from Others reported significantly more post anagram sadness than PG participants scoring below average CSW Approval from Others. PG participants scoring above average in CSW Academic Competence reported significantly more ruminative thoughts during the SART then MG participants scoring above average in CSW Academic Competence.

Discussion

The main aim of the current study was to test the hypothesis that a causal relationship exists between goal orientation, depressive affect, and state rumination. Additionally, it was predicted that the relationship between goals and depressive affect would be moderated by contingent self-worth and trait rumination.

Initial analysis found no significant differences between the performance goal condition and the mastery goal condition on these outcome variables. On further analysis, the predicted relationship between induced goal orientation and the outcome variables described above was moderated by high levels of trait CSW in the domains of Approval from Others, and Academic Competence. For those with high contingent self-worth in those domains listed, significant differences between performance and mastery groups occurred on a range of outcome variables including sadness and rumination. Other contingencies of self-worth and mood before testing were not found to moderate the relationship between goal orientation and outcome variables. Trait rumination was not found to significantly moderate this relationship, but was a main predictor of outcome variables.

Regards hypothesis 1, there were no statistically significant differences in sadness or anxiety found between the conditions. These findings are inconsistent with previous study results (Cury et al., 2006; Dweck & Leggett, 1988) and social-cognition theories of depression (Rothbaum, et al. 2009).   This may suggest there is a weaker relationship between goal orientation and depression than our model proposes. Alternatively, the results may indicate that the stressor was insufficient to induce those in PG to adopt a performance-avoidance goal.   In support of this premise, the experimenter observed some participants reframed the performance manipulation script toward an approach orientation. Research has shown those with performance-approach goals behave adaptively and do not experience the same "adverse reactions" to stressors that are not prolonged or severe (Kaplan & Maehr, 2007). We may suggest that the anagram task may not have provided a sufficiently prolonged or severe stressor for those in the PG to adopt performance-avoidance orientations.

Congruent to Rothbaum et al.'s model (2009) proposing rumination protects self-worth if under threat, Hypothesis 2 proposed PG would report more state rumination than MG post anagram failure. There was no significant difference found between PG and MG on self-reports of state rumination post-anagram failure. Consistent with Martin & Tesser's (1996) control theory, these findings may suggest that in both conditions state rumination was equivalent because both experienced an equivalent degree of discrepancy between their goal at the end of anagrams and their perceived progress toward this goal, irrespective of their goal orientation. Perhaps participants that adopted learning goals may still experience threats to self-worth and as a consequently ruminate, if they perceive goal discrepancy, i.e., they are not learning or fail to experience mastery in that domain of ability.

There were no significant differences in ruminative self-focus during the SART, and retrospective ratings of anagram rumination between PG and MG failing to support Hypothesis 3. Alternatively, for a non-clinical sample, the SART may provide a distraction from ruminative thoughts, thereby producing a blanketing effect on the rumination caused following failure on the anagram task. To support this assertion, during the first half of the SART, there were low ratings of ruminative self-focus and low ratings on the anagram check post SART. These contrasted with high ratings of state rumination post Anagrams.

Hypothesis 4 proposed that PG participants would report higher levels of ruminative self-focus, sadness and anxiety than MG on the first half of the SART. Contrary to previous research (Dweck & Leggett, 1980), and theory (Dykman, 1998; Rothbaum et al., 2009), no significant differences between conditions were found. These results may partially be explained by the arguments forwarded to explain the results in hypothesis 1. Alternatively, research suggests rumination maintains depressive symptoms (Nolen-Hoeksema, 1991). If there were no significant differences between conditions for state rumination, this research would predict no significant difference in depressive symptoms such as sadness and anxiety.

As a final task, participants were told they had a choice between further anagrams, which provided them with another opportunity to build on past learning but was also a potential source of further failure and threat to self-worth, or an alternative task which was a less valid predictor of future academic competence. Contrary to hypothesis 5 that proposed PG will be more likely than MG to avoid further anagrams and choose a task that avoids proof of worthlessness, no significant difference between conditions was found. A large majority of participants chose to complete the alternative task and avoid anagrams, in contrast to other research findings (Dweck & Leggett, 1980). This

could suggest the first anagram task was seen unanimously as threatening to self-worth, inducing adoption of performance avoidance goals.   Helplessness theory (Abramson, Seligman, & Teasdale, 1978) would predict this result proposing only those with prolonged exposure to failure will remain in an aversive situation, rather than change and try something new that has uncertain consequences.   This discrepancy may therefore be due to participants experiencing limited failure prior to this study, or the preponderance of experiences they have had in which changing task has been effective in relieving distress, and facilitating growth.

The role of rumination as a mediating factor between goal orientation and outcomes related to depression was not able to be tested due to findings presented in the discussion so far.   However, mixed results were found for hypothesis 6 which predicted domains of CSW and trait rumination would moderate the relationship between goal manipulation and outcome variables, specifically mood post anagrams, and rumination before and during the SART.

Those in PG with high trait CSW Academic Competence reported significantly more ruminative thoughts in the first half of the SART than the MG with high CSW Academic Competence.   These findings support the current proposed model which predicts those individuals whose self–worth is contingent on academic competence, are more likely to have vulnerable self-beliefs and be predisposed to adopting self-worth goals in academic tasks, if encouraged to do so.   In the face of failure, they are more likely to adopt a performance - avoidance goal orientation.   Once a stressor has occurred they are predicted to employ defensive strategies such as rumination about past failure (Rusk, Tamir, & Rothbaum, 2011).   An interactive relationship between high goal importance (similar to CSW) and low success has been shown to predict state rumination about problems (Moberly & Watkins, 2010).   None of these

interrelationships were expected to occur for those participants whose self- worth was less contingent on academic competence. However it was expected that those with high contingent self-worth based on academic ability in the PG would also report more depressive symptoms (mood and rumination) on other outcome measures. This did not occur however suggesting this effect may be situationally and temporally limited.

At moderate to high levels of CSW Approval from Others, PG reported significantly higher levels of post anagram sadness, as well as sadness and rumination about anagrams and other worries during the first half of the SART, and made significantly less errors of omission and commission in the second half of the SART. This finding supports the current elaborated model. Self-worth, highly contingent on others approval (a type of extrinsic self-worth), increases the likelihood you will seek to prove yourself as worthy to others. Hypothetically one would therefore be more likely to adopt performance goals (approach and avoidance) when prompted, be more sensitive to performance avoidance goal manipulations when faced with failure, and therefore be more likely to present with defensive behaviours such as rumination (Rothbaum et al., 2009). It is also possible that those reporting high CSW Approval from Others, are more sensitive to mastery goal manipulations because these manipulation scripts explicitly signify others' negative judgements are not salient to the aims of the task. Therefore vulnerable self-beliefs related to others' judgements of good or bad academic task performance are not activated and do not lead to performance goal orientations or their outcomes.

The manipulation checks appear to suggest that the manipulation was unsuccessful and therefore any results should be interpreted with caution. The items used as a manipulation check may not have been sensitive to all the effects of the manipulation. The inferences made so far assume that significant differences on

outcome measures between both MG and PG groups indicated the goal manipulation was successful and therefore inferring manipulation checks themselves were insensitive or lacked validity. The simplest explanation is that the goal manipulation appeared to be ineffective for the majority of the sample excluding participants either moderate or high in trait CSW Approval from Others or high in trait CSW Academic Competence[11].

Another limitation is that the sample size was not sufficient to discover the effect of the manipulation (type II error). Some previous studies using similar manipulations have used moderately larger sample sizes (n ≥ 100, Dykman, 1998; Elliot & Dweck, 1988), whilst other research has shown effective goal manipulations for sample sizes similar to that used in the current study (n ≤ 78, Darnon, Butera, & Harackiewitz, 2007; n ≥ 51, Darnon, Harackiewitz, & Butera, 2007). Power calculations based on previous studies results suggested this study's sample size was large enough to find a genuine effect, and the differences between both groups in some outcomes were very small suggesting other factors may have greater influence over the results.

Secondly, differences in the sample population between the current study and previous studies may account for the failure of the manipulation. Many studies employing goal manipulations with children (Elliot & Dweck, 1988) and therefore developmental factors may partially explain the differential reactions to manipulation. However, goal manipulations almost identical to those used in the present study have been effective with undergraduate samples with similar demographics (Darnon et al., 2007).

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[11] Trait rumination and pre-experimental mood were not found to moderate the relationship between goal orientation and outcome variables. Of note, regression analyses found sadness at baseline, and trait rumination (brooding and reflection subscales), were significant predictors of all outcome variables but were not found to moderate the effect of the manipulation. CSW Academic Competence, and CSW Approval from others were also indicated to be a predictors of the remaining outcome variables where no moderating effect was found.

The majority of students had already taken part in several psychology studies and will most likely have been subject to previous deceptions and manipulations not dissimilar to that used in this study. They may have been sensitive and vigilant to suspected manipulations, confounding the results.

Alternatively there may be theory driven reasons for why the manipulation failed. Rothbaum et al.'s model (2009) stressor(s) have to be sufficiently distressing and prolonged in order to shift from a self- worth goal to a 'predominance' of performance-avoidance goals, and consequently be at risk of depressive symptoms (Dykman, 1998). The manipulation may have failed because the stressor, i.e. task failure, may not have been prolonged or distressing enough to induce negative self-beliefs. It is not clear from Rothbaum's theory, what time duration or quantitative increase in distress is requisite for a shift to negative self-beliefs and performance-avoidance goals. Insensitive measures, specifically the SART (Roberts, et al., 2013), may account for the non-significant differences between groups. This task was shown to be sensitive to changes to ruminative self-focus, and mood following an unresolved goal being 'cued' in a study by Roberts et al. (2012). The unresolved goal however was personal and meaningful to the participants potentially inducing a greater ruminative effect than the present studies less personal goal manipulation.

As the goal manipulation was largely unsuccessful, this has impeded attempts to derive clinical implications from the study's findings. However, the manipulation's proposed ineffectiveness may suggest that goal orientation is largely dispositional, and requires a prolonged stressor in order to trigger a shift in an individual's general goal orientation. If substantiated this has clinical implications.

The most interesting finding was the moderating effect of CSW based on approval from others and to a lesser extent academic competence. Although further research is required to corroborate this assertion, assessing clients' goal orientation and contingent self- worth may enhance the clinician's ability to predict those whom are more likely to drift into depression following or during stressors because of goal orientation's and contingent self-worth's suspected dispositional nature. It may also indicate, for someone to make positive changes from a performance orientation toward a greater emphasis on mastery orientation, minor encouragement toward mastery goals in the presence of non-contingent, localised, and malleable beliefs are necessary but not sufficient. Personally meaningful prolonged stressors perhaps like ruptures in the therapeutic relationship may be required to instigate changes in goal orientation.

The finding that certain levels and types of contingent self- worth, in interaction with a context encouraging performance avoidance goal orientation, predicted higher rumination and depressive symptoms highlights the need for approaches to take account of the motivations for individuals' goals, specifically being sensitive to the presence of an extrinsic value base, and to aim to support individuals to develop a balance between intrinsic and extrinsic motivations.

Suggestions for future research

Future research aiming to test the validity of the model by adopting a similar design to this study may need to increase the power of the stressor by increasing difficulty or prolonging its use. Due to time and resource constraints during this study it was not possible to conduct a pilot study and therefore a manipulation was constructed based on those used in previous studies with the assumption that

previous effects would be replicated. However, despite early testing suggesting the manipulation was successful, this was not robust. Future research should initially pilot a manipulation using a range of explicit and implicit measures to test goal orientation. It may be that goal orientation is more dispositional and fixed and therefore is less susceptible to manipulation than is indicated by existing literature. In this case, it may be more helpful to adopt a longitudinal design using daily measures or existing measures at certain time points.

Conclusion

In conclusion this study provides preliminary evidence to support the inclusion of contingent self-worth (CSW) based on academic competence, and approval from others in models explaining the relationship between goal orientation and depression. It appears that self-worth strongly contingent in these areas may equate to the vulnerable self-beliefs, described by Rothbaum. Therefore, people with high values in these CSW areas may be more vulnerable to adopting a performance goal orientation when faced with a negative life event and are likely to be more susceptible to experimental goal manipulations. This finding may advocate for current clinical approaches to the treatment and prevention of depression to incorporate further, motivational factors.

Conflict of Interest

None of the authors have conflict of interests or financial disclosures.

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Appendix A - Instructions to authors

See 'Appendix C - Instructions to authors' in Part 1, Literature Review

Appendix B

Sample size calculations were conducted using GPower2. Based on the effect size reported in the Elliot & Dweck[12] (1988) study, we assumed large effect sizes. To investigate H1 a sample size of 46 participants would be required to detect a large effect size (η^2 = .35) with power = .8 and α = .05. For hypothesis H2 participants 21 would be required to detect a large effect size (r = .50). For hypotheses H3 46 participants would be required to detect a large effect size (η^2 = .35). For hypothesis H4 72 participants would be required to detect a medium effect size (η^2 = .15) with power = .8 and α = .05. For hypotheses H5, a total sample size of 46 participants would be required, and for H6 a sample of 72 participants required, to detect a large effect size (r = .50) with power = .8 and α = .05. For H7 a sample of 48, would be required to detect a large effect size (f = .35) with power = .8 and α = .05. The Hypothesis H8 would require 48 participants to detect large effect size (f = .35) with power = .8 and α = .05. These calculations indicated that overall a total sample of 72 participants would need to be recruited.

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[12] calculations for the effect sizes from Elliott & Dweck (.5 = large, .3 = medium, .1 = small):

Elliott & Dweck (1988): task choice (w = .49, large), strategy change during failure (.27/.24 hi/lo ability, medium), verbalized attributions (w = .44/.14 lo/hi ability, large/small), verbalized NA (.50/.19, low ability, large/small-medium).

Appendix C: Procedural Flow Chart

BEFORE TESTING:
E-mail Trait measures to participants.
(Measures of Trait Rumination and Contingent Self- Worth)

START OF TESTING SESSION:
Study information sheet + consent for filled in and read
Participants given Depression Measure PHQ-9

Mood State Assessment (Ax.)- 9 point bipolar computerised scales

Performance Manipulation

Mastery Manipulation

15 Difficult Anagrams

Manipulation check plus, State Rumination Assessment, Mood State Assessment

Reiterate of manipulation script (ammended script from that provided at either step 4 a or 4 b)

SART task

State Rumination check plus, Mood State Ax.

Task choice: more anagrams to develop skills and score or similar difficulty task where participants can avoid showing their competence at doing previous anagrams.

Positive Mood Induction Task: Relaxation Exercise

Debrief

Appendix D: Anagrams from first experimental task

Anagram	Correct Answer
Oldme	Model
Hroab	Abhor
Datir	Triad
Tinga	Giant
Aewtk	Tweak
Dgrou	Gourd
Tanbo	Baton
Aitop	Patio
Mgeon	Gnome
Rigon	Groin
Malby	Balmy
Rcoha	Roach
Arfyo	Foray
Glaei	Agile

Appendix E: Patient Health Questionnaire -9

PHQ-9 Patient Questionnaire

Nine symptom checklist

Patient Name: _____ Date: _____

Dear Patient,

In an effort to provide the highest standard of care and meet the requirements of your insurance company, we ask that you fill out the form below. This form is used as both a screening tool and a diagnostic tool for depression. Your provider will discuss the form with you during your visit. Thank you for your cooperation and the opportunity to care for you.

1.   Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

Not at all	Several days	More than half the days	Nearly every day
0 1	2	3	

	Not at all	Several days	More than half the days	Nearly every day
a. Little interest or pleasure in doing things	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless.	☐	☐	☐	☐
c. Trouble falling/staying asleep, sleeping too much.	☐	☐	☐	☐
d. Feeling tired or having little energy.	☐	☐	☐	☐
e. Poor appetite or overeating.	☐	☐	☐	☐
f. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.	☐	☐	☐	☐
g. Trouble concentrating on things, such as	☐	☐	☐	☐

reading the newspaper or watching television.

h. Moving or speaking so slowly that other people ☐ ☐ ☐ ☐
could have noticed. Or the opposite – being so
fidgety or restless that you have been moving
around a lot more than usual.

i. Thoughts that you would be better off dead or of ☐ ☐ ☐ ☐
hurting yourself in some way.

Appendix F: Ruminative Response Scales of the Response Style

Questionnaire *(RRS-RSQ Noel-Hoeksema & Morrow, 1991*

Rumination Scale

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed.

Please indicate what you *generally* do, not what you think you should do.

Almost Never	Sometimes	Often	Almost Always	
☐	☐	☐	☐	1. Think "What am I doing to deserve this?".
☐	☐	☐	☐	2. Analyse recent events to try to understand why you are depressed
☐	☐	☐	☐	3. Think "Why do I always react this way?"
☐	☐	☐	☐	4. Go away by yourself and think about why you feel this way
☐	☐	☐	☐	5. Write down what you are thinking about and analyze it
☐	☐	☐	☐	6. Think about a recent situation, wishing it had gone better
☐	☐	☐	☐	7. Think "Why do I have problems other people don't have?"
☐	☐	☐	☐	8. Think "Why can't I handle things better?"
☐	☐	☐	☐	9. Analyze your personality to try to understand why you are depressed.

☐ ☐ ☐ ☐ 10. Go someplace alone to think about your feelings.

Appendix G - Contingencies of Self Worth Scale

Personality Questionnaire

INSTRUCTIONS: Please respond to each of the following statements by circling your answer using the scale from "1 = Strongly disagree" to "7 = Strongly agree." If you haven't experienced the situation described in a particular statement, please answer how you think you would feel if that situation occurred

		Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
.	When I think I look attractive, I feel good about myself.	1	2	3	4	5	6	7
.	I feel worthwhile when I perform better than others on a task or skill.	1	2	3	4	5	6	7
.	My self-esteem is unrelated to how I feel about the way my body looks.	1	2	3	4	5	6	7
.	Doing something I know is wrong makes me lose my self-respect.	1	2	3	4	5	6	7
.	I don't care if other people have a negative opinion about me.	1	2	3	4	5	6	7
.	Knowing that my family members love me makes me feel good about myself.	1	2	3	4	5	6	7
.	I can't respect myself if others don't respect me.	1	2	3	4	5	6	7
.	My self-worth is not influenced by the quality of my relationships with my family members.	1	2	3	4	5	6	7
.	Whenever I follow my moral principles, my sense of self-respect gets a boost.	1	2	3	4	5	6	7
0.	Knowing that I am better than others on a task raises my self-esteem.	1	2	3	4	5	6	7
1.	My opinion about myself isn't tied to how well I do in school.	1	2	3	4	5	6	7
2.	I couldn't respect myself if I didn't live up to a moral code.	1	2	3	4	5	6	7

		Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
3.	I don't care what other people think of me.	1	2	3	4	5	6	7
4.	When my family members are proud of me, my sense of self-worth increases.	1	2	3	4	5	6	7
5.	My self-esteem is influenced by how attractive I think my face or facial features are.	1	2	3	4	5	6	7
		Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
6.	Doing well in school gives me a sense of self-respect.	1	2	3	4	5	6	7
7.	Doing better than others gives me a sense of self-respect.	1	2	3	4	5	6	7
8.	My sense of self-worth suffers whenever I think I don't look good.	1	2	3	4	5	6	7
9.	I feel better about myself when I know I'm doing well academically.	1	2	3	4	5	6	7
0.	What others think of me has no effect on what I think about myself.	1	2	3	4	5	6	7
1.	When I don't feel loved by my family, my self-esteem goes down.	1	2	3	4	5	6	7
2.	My self-worth is affected by how well I do when I am competing with others.	1	2	3	4	5	6	7
3.	My self-esteem is influenced by my academic performance.	1	2	3	4	5	6	7
4.	My self-esteem would suffer if I did something unethical.	1	2	3	4	5	6	7
5.	It is important to my self-respect that I have a family that cares about me.	1	2	3	4	5	6	7
6.	My self-esteem does not depend on whether or not I feel attractive.	1	2	3	4	5	6	7
7.	My self-worth is influenced by how well I do on competitive tasks.	1	2	3	4	5	6	7

8.	I feel bad about myself whenever my academic performance is lacking.	1	2	3	4	5	6	7
9.	My self-esteem depends on whether or not I follow my moral/ethical principles.	1	2	3	4	5	6	7
0.	My self-esteem depends on the opinions others hold of me.	1	2	3	4	5	6	7

Appendix H: Ethical Approval Letter

UNIVERSITY OF
EXETER

Psychology Research Ethics Committee

Psychology, College of Life & Environmental Sciences

Washington Singer Laboratories

Perry Road

Exeter

EX4 4QG

Telephone   +44 (0)1392 724611

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EmailMarilyn.evans@exeter.ac.uk

To:	**George William Baines**
From:	**Cris Burgess**
CC:	**Nicholas Moberly**
Re:	**Application 2013/514 Ethics Committee**
Date:	**11th February 2014June 15, 2015**

The School of Psychology Ethics Committee has now discussed your application, ***2013/514 – An investigation into the relationship between depressive symptoms, performance and mastery cued goals, affect and rumination .*** The project has been approved in principle for the duration of your study.

The agreement of the Committee is subject to your compliance with the British Psychological Society Code of Conduct and the University of Exeter procedures for data protection (http://www.ex.ac.uk/admin/academic/datapro/). In any correspondence with the Ethics Committee about this application, please quote the reference number above.

I wish you every success with your research.

Cris Burgess

Chair of Psychology Research Ethics Committee

Appendix I: Patient Information Sheet

PSYCHOLOGY, COLLEGE OF LIFE AND ENVIRONMENTAL SCIENCES

STUDY INFORMATION SHEET

Title of study: An investigation into the relationship between depressive symptoms, performance and mastery goals, affect and rumination.

Researchers: **George Baines**; Trainee Clinical Psychologist

Dr. Nick Moberly; Senior research Fellow, University of Exeter

Address:

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Washington Singer Laboratories

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gwb203@ exeter.ac.uk

Start Date:25/1/2014:   **End Date: 1/6/2014**

WHAT IS THIS STUDY ABOUT?

The study aims to investigate how people feel, think, behave and perform when doing a task that provides them the opportunity to meet specific personal goals. We're interested in whether the type of goals people have when approaching a meaningful task may be related to patterns of behavior and emotions synonymous with depression.

WHAT THIS STUDY INVOLVES

This study involves taking part in a number of tasks completed in one testing session. We will firstly ask you for contact details, your address and details of your GP. Prior to attending the experimental session you will be sent two short screening questionnaires asking about your thinking style whilst in certain moods or feeling states, and your personality. The experiment will last for one hour. When you arrive you will be asked to fill in a mood questionnaire and be

given some guidance about the nature of the forthcoming tasks and how to approach them. You will then be asked to complete a series of cognitive tasks, one assessing your non-verbal reasoning using anagrams and the other assessing your capacity for sustained attention. You will then be given a choice, from two options, of what you'd like to do as a third and final cognitive task. Both options will be similar in nature to the first two tasks. All tasks will be computer based with clear instructions provided. To find out how you are approaching these tasks we will ask about your mood and the focus of your thoughts during and after you've completed them. Whenever you leave the study I will explain the purpose of the research in more detail and answer any questions that you may have. You are free to not answer any particular question or item if you do not wish to do so.

Why do I need to provide details about my GP?

We ask you to provide contact details for your GP as we may need to contact him/her if we are concerned about your wellbeing or if there is any risk of harm to you or someone else. If this happened, we would need to inform your GP of this to ensure you are receiving the correct help and support. We will tell you if we feel we need to do this.

WHO IS ORGANISING THIS RESEARCH?

The research is conducted by George Baines, Trainee Clinical Psychologist at the University of Exeter. George is supervised by Dr Nick Moberly, (Senior Lecturer).

What are the possible benefits of taking part?

You will receive 1 course credit for taking part in the study. In addition you will have a

chance to get some insight into yourself and the way you approach meaningful tasks, as well as

learning about this area of psychology.

WHAT WILL HAPPEN TO THE INFORMATION YOU GIVE?

All data gathered will be identifiable only through an ID number (not your name). No one else will see this data apart from the researchers and we will not communicate any of this information to anybody else. Your name and contact details will be stored securely and separately from any personal information that you provide on the questionnaires. All information collected during the study will be kept securely and will remain confidential.

WHAT WILL HAPPEN TO THE RESULTS OF THE STUDY

When complete, we may communicate the results of the study to the wider community of researchers. This is typically achieved through writing up the results in an academic journal and/or presenting the results at conferences. This will NOT involve identification of any individuals who took part in the research.

CONSENT

Your participation in the study is entirely voluntary. Having read this information, if you do not wish to participate, that is okay. If you do decide to participate, you are always free to withdraw at any time, without needing to give a reason. If you agree to take part, please sign the Consent Form. If you have any questions, please ask them now before signing this form. Even if you sign this form, you are still free to withdraw from the study at any time without needing to give a reason.

WHERE CAN I FIND OUT MORE INFORMATION ABOUT THE STUDY?

You are free to ask questions about the study at any time before, during or after you participate. You can contact the research team via email: gwb203@exeter.ac.uk

Appendix J: Consent Form

PSYCHOLOGY, COLLEGE OF LIFE AND ENVIRONMENTAL SCIENCES

CONSENT FORM

Title of Project: An investigation into the relationship between depressive symptoms, performance and mastery goals, affect and rumination.

Name of Researcher: George Baines, Trainee Clinical Psychologist, D.Clin Psych

Dr. Nick Moberly; Senior research Fellow, University of Exeter

Please tick box

1. After reading the Study Information Sheet for the above study I agree to take part. I have had the opportunity to ask questions.   ☐

2. I understand that my participation is voluntary and that I am free to withdraw from the study at any point, without giving a reason.   ☐

_____   _____

_____

Participant name   Signature   Date of birth

_____   _____

_____

Researcher   Signature   Date of testing

Appendix K: Debriefing Sheet

Debrief

The experiment is now over. I'd like to debrief you and explain the rationale for the study more fully.

Firstly, contrary to what I told you at the beginning these tasks are not a standardised test for intellect and do not predict your intellectual or academic ability. They do not tell you or us anything about your academic functioning no matter how well or badly you thought you did. To fulfil the aims of the experiment, we needed you to believe they did however to mimic a real life situation where your awareness of your own competence would become salient and to feel as if it were being assessed.

We wanted to know whether people differed in the way they reacted to this scenario depending on the type of goal they adopted for completing the tasks.

You received one of two types of scripts describing your goal as guidance for how to approach the task. The script that you received was determined randomly for each participant.

Either you received the script that told you should try to avoid performing worse than your peers, a "performance-avoidance goal", <u>or</u> you were told to learn, and develop your abilities on the task, a "mastery-approach" goal. You received the (enter mastery or performance here) manipulation.

You were then given a difficult anagram task in which (based on prior tests on students) it would be unlikely for you to succeed on every occasion. This was done to provoke you to begin to brood over your performance. If you felt bad or frustrated after the anagram task, we expected this because we designed them to be hard so that you would brood and ruminate.

A sustained attention task followed which was designed to test whether people continued to brood and ruminate about the previous anagram task and, if they did, to see whether that brooding had a detrimental effect on your mood and performance.

Although there is limited research in this area, previous studies' results have suggested a link between the type of goal they have when approaching a task, how they think during and after

the task, their emotions during and after that task, and their consequent behaviour including their performance on that task, and whether or not they persevere with the task to achieve their aims. There is a particularly link between performance goals and behaviours associated with clinical depression.

We predicted that those given a performance goal, i.e. those told to avoid performing worse than your fellow students would be more likely, than those given a mastery goal, to think their self-worth was under threat, ruminate and brood over one's performance following failure with difficult anagrams in a way which impedes their performance on a later less challenging task, the sustained attention task, and experience more negative emotions as a result. We believe that the results of this study may eventually contribute to psychosocial treatments for depression that focus people on more adaptive goals, and therefore this research could have a potentially positive impact for people who are adversely affected by depression.

Do you have any further questions?"

Appendix L -

Table L1

Distributions of Variables and Transformations Applied to Achieve Normality

Variable	Skewness z score	Kurtosis z score	Transformation appropriate?[13]	Transformation applied?[14]
Age Performance Condition	2.22	1.21	No	No
Age Mastery condition	7.20	7.74	Yes	Transformation unsuccessful
Age within group	5.97	8.32	Yes	Transformation unsuccessful
PHQ-9	2.26	0.66	No	No
PHQ-9 Mastery	1.74	1.12	No	No
PHQ-9 Performance	1.37	-0.65	No	No
CSW Competition Performance	-0.30	0.20	No	No
CSW Competition Mastery	-1.62	-0.17	No	No
CSW Competition Within Group	-1.13	0.17	No	No
CSW Appearance	-0.37	-0.42	No	No
CSW Academic	0.52	0.11	No	No

---

[13] Normality of distributions was determined by examining normality plots in combination with skewness and kutosis z-values for each distribution. Z-values above 2.58 were taken to indicate an unacceptable level of skewness of kurtosis.

[14] Appropriate transformation methods were selected in line with the recommendations of Tabachnik and Fidell (2001), which take into account data distribution patterns.

Competence Perform.				
CSW Academic Competence Mastery	-0.94	0.08	No	No
CSW Academic Competence Within G.	-0.26	0.01	No	No
CSW Family Support Performance	0.35	-0.48	No	No
CSW Family Support Mastery	0.02	-0.46	No	No
CSW Family Support	1.03	-0.55	No	No
CSW Virtue within Group	-1.14	2.08	No	No
CSW approval others within group	-2.48	1.11	No	No
RRS RSQ Brooding Performance	0.98	-0.80	No	No
RRS RSQ Brooding Mastery	1.62	-0.86	No	No
RRS Brooding within groups	1.81	-0.77	No	No
RRS Reflection Performance	1.09	-0.67	No	No
RRS Reflection Mastery	1.15	-0.90	No	No
RRS RSQ	1.48	-1.12	No	No

Reflection				
RRS RSQ Total	1.84	0.2	No	No
Post Anagram sad	1.06	-1.80	No	No
Post Anagram Anx	1.98	-1.00	No	No
Post-Anagram Mood minus Initial Mood Performance	0.36	-0.85	No	No
Post-Anagram Mood minus Initial Mood –Mastery	2.1	-0.96	No	No
Difference post anagram Anxiety - initial anxiety-Performance	1.18	-0.83	No	No
Post-Anagram Anx. minus Initial Anxiety-Mastery	1.26	1.77	No	No
Manipulation check P1 Performance	-1.49	0.97	No	No
Manipulation check P1 Mastery	0.30	1.35	No	No
Manipulation check P1 within group	-1.23	-1.75	No	No
Manipulation check M1 Performance	-1.82	-0.96	No	No

Manipulation check M1 Mastery	-0.94	1.05	No	No
Manipulation check M1 within groups	-1.82	-1.41	No	No
Manipulation check P1 Performance	-0.95	-1.53	No	No
Manipulation check P1 Mastery	0.74	-1.55	No	No
Manipulation check P2	-0.13	-2.40	No	No
Manipulation check M2 Performance	-2.43	0.26	No	No
Manipulation M2 Mastery	-1.78	0.17	No	No
Manipulation check M2 within groups	-2.89	-0.04	No	No
State rumination Q1 Performance	-1.70	-0.39	No	No
State Rumination Q1 Mastery	-1.43	-0.82	No	No
State Rumination Q1 within groups	-2.13	-0.92	No	No
State Rumination Q2 Performance	2.43	0.44	No	No

State Rumination Q2 Mastery	-4.32	4.03	No	No
State Rumination Q2 within groups	-4.65	2.90	No	No
State Rumination Q3 Performance	-1.78	-0.75	No	No
State Rumination Q3 Mastery	-2.39	1.06	No	No
State Rumination Q3 within groups	-2.81	-0.05	No	No
Overall PQ Performance	2.63	0.17	No	No
Overall PQ Mastery	3.03	0.80	No	No
Overall PQ within gorups	3.83	0.45	No	No
1st half SART mood performance	0.21	-1.65	No	No
1st half SART mood mastery	0.41	-1.02	No	No
1st half SART mood within group	0.40	-1.79	No	No
1st half SART average mood rating-initial mood :performance	0.75	0.16	No	No
1st half SART average mood rating-	-0.29	-1.21	No	No

initial mood :mastery				
1st half SART tense: Performance	0.86	-0.80	No	No
1st half SART tense: Mastery	1.41	-1.21	No	No
1st half SART tense within group	0.40	-0.72	No	No
1st half SART average self – focus perform	0.55	-0.47	No	No
1st half SART average self – focus mastery	0.43	-1.01	No	No
1st half SART self focus within group	0.95	-0.72	No	No
Anagram check performance	1.84	-0.56	No	No
Anagram Check mastery	2.55	0.38	No	No
Anagram Check	2.59	-0.31	No	No
Task Choice	n/a	n/a	No	No

Appendix M:

Preliminary analysis:

To examine whether variables had normally distributed data, both graphical representations and measures of kurtosis and skewness were used.

Manipulation check

There were no significant differences found between the conditions of Induced Mastery Goal (*M*=8.92, *SD*=4.35) vs Induced Performance Goal (*M*=9.8, *SD*=4.56) for self-rated performance goal orientation, *t*(58) = -1.07, *p* =.29. There were no significant differences found between mastery (*M* = 11.79, *SD* = 4.0) and performance (*M* = 12.4, *SD* = 3.1) conditions for self-rated mastery goal orientation, *t*(58) = 0.44, *p* =.67. It was therefore concluded that the manipulation may have been unsuccessful. However, because self-reported goal orientation may not be sensitive to all the effects of the manipulation, as well as the fact that there was substantial existing literature which reported these manipulations have been successful, it was decided to continue with the planned analysis.

      Incidental Checks.

There was no significant difference found between the performance (*M* = 2.56, *SD* = 1.81) and mastery (*M* = 2.35, *SD* = 1.98) conditions for perceived performance on the initial anagram task, *t*(66) = 0.51, *p* =.61. No significant difference was found between performance (*M* = 1.79, *SD* = 0.98) and mastery (*M*= 1.68, *SD* = 0.91) conditions for overall total of anagrams solved , *t*(66) = 0.45, *p* =.66. There was a very low percentage of anagrams solved as intended by the experimenters

Appendix N: Goal Manipulation Scripts

Performance goal manipulation script:

"In this experiment, you'll be asked to complete some tasks on a computer. Taken together, these tasks have been shown to be a good assessment of your future academic performance. It is important for you to focus on your performance and aim to avoid doing poorly relative to others on the different tasks presented here. Keep in mind that we are concerned with how you perform compared to your peers and you should try not to perform more poorly than the average student."

Mastery goal manipulation script:

"In this experiment, you'll be asked to complete some tasks on a computer. Taken together, these tasks have been shown to be a good assessment of your future academic performance. It is important for you to try to focus on learning from your mistakes and aim at getting better at the tasks presented here. Keep in mind that we are concerned with how you develop and enhance your own skills and you should try to learn new strategies that help you on the tasks."

Appendix O:

State rumination measurement items following anagram task.

"During the anagram task, to what extent were your thoughts focused on yourself?"

"During the anagram task, to what extent were you thinking about how you were performing on the task?"

"During the anagram task, to what extent were your thoughts about your performance interfering with your concentration and focus?"

Manipulation check items:

Performance goal items:

"During the anagram task, to what extent were you concentrating on avoiding solving fewer anagrams than other people?"

"During the anagram task, to what extent were you concentrating on how well you might be performing compared to others?"

Mastery goal items:

During the anagram task, to what extent were you thinking about ways you could improve your chance of solving the anagrams?"

"During the anagram task, to what extent were you trying to find a more productive strategy?"

Appendix P: Demographic information of the sample

Table P1

Descriptive Statistics for Variables Across Each of the Conditions

	Performance Goal Condition (PG)		Mastery Goal Condition (MG)	
	Mean	SD	Mean	SD
Age	19.06	.98	19.12	1.28
PHQ	2.21	.95	1.88	.84
CSW Competition	4.89	.60	4.98	.73
CSW Acad. Comp	5.39	.79	5.35	.78
CSW Family support	5.61	.60	5.55	.73
CSW Approval from others	4.91	.85	4.72	1.04
RSQ Brooding	11.24	3.12	10.41	2.79
RSQ Reflection	10.62	3.44	10.56	4.04
RSQ Total	21.54	5.49	20.97	6.08
Anagrams solved	2.56	1.81	2.35	1.98
Perceivd Anag performance	1.79	.98	1.68	.91
Initial Sad	1.65	.69	1.85	1.10
Post Anagr. sad	3.47	1.85	3.24	1.84
Post SART Sad	2.88	1.45	2.56	1.58
Post Angr. –initial Sad	1.82	1.77	1.35	1.47
Post SART –initial sad	1.24	1.18	.68	1.51
Initial Anxiety	2.00	1.04	2.06	1.46
Post Anagram Anxiety.	3.82	2.19	3.15	1.99
Post SART Anxiety	2.94	1.59	2.71	1.38
Post Angr. –initial Anxiety	1.82	2.24	1.09	1.71
Post SART –initial sad	.94	1.59	.65	1.32
State Rumination post Anag	19.79	4.39	20.00	4.63
Omission 1st half SART	3.00	2.53	3.32	3.72
Omission 2nd half SART	4.76	3.68	5.32	4.85
Commission 1st half SART	1.53	2.44	1.12	1.72
Commission 2nd half SART	.8235	1.14	1.29	1.53
Intrusive thgt. D 1^{st}hlf SART	.68	1.09	.53	.83
Intrusive thgt D 2^{nd}hlf SART	.35	1.10	.29	.53
Intrusive thgt.E 1st hlf SART	.76	1.48	.65	1.15
Intrusive thgt E 2nd hlf SART	1.06	1.48	.82	1.45
Mood 1st half SART	3.64	1.03	3.53	1.10
Tense 1st half SART	4.15	1.26	4.40	1.83
Self-Focus 1st half SART	3.41	1.16	3.10	1.32
Intrusive thght. Anag. check	3.15	1.97	3.09	1.93

Appendix Q: Dissemination statement

In order to ensure that the research findings are disseminated, it is hoped that a paper will be submitted to the Journal of Cognition and Emotion. A back-up plan is to submit it to another journal should it not be accepted (e.g. Journal of Personality and Social Psychology). It is also hoped that the findings will be presented at a BABCP conference on affective disorders. Finally, a lay summary of the findings will also be emailed out to the lived experience group at the Mood Disorders Centre.

Appendix R: Summary of the project's proposed theoretical model that expands on the social cognition model proposed by Rothbaum et al. (2009).
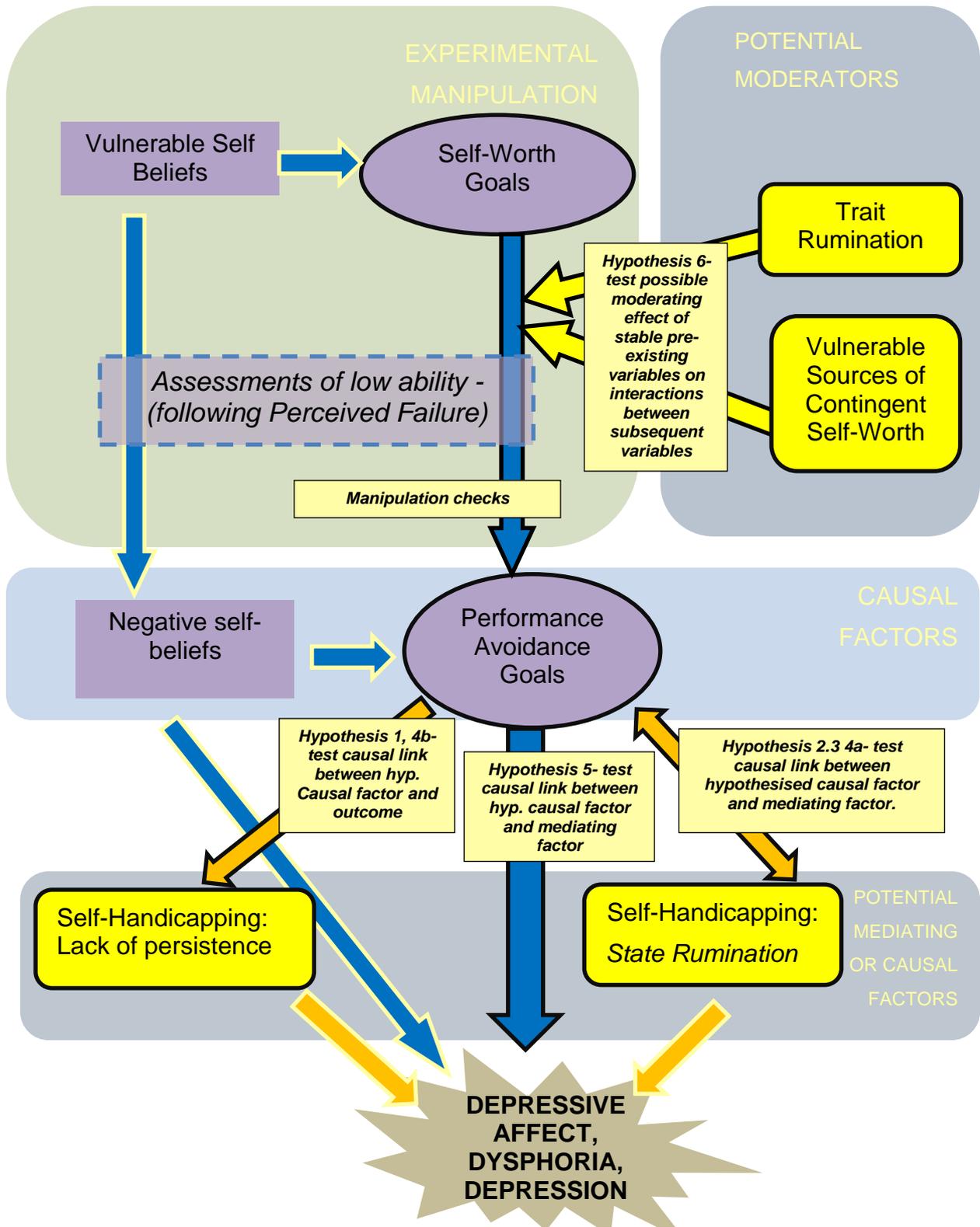
Appendix S: Tests of Regions of Significance- Johnson Neymar technique
(Hayes & Matthes, 2009):

1) *Why use test of 'regions of significance'?*

Although a multiple regression analysis for moderation will indicate that the moderator (e.g. contingent self-worth) interacts with the predictor variable (e.g. goal type) to predict an outcome (e.g. depressive mood), it does not indicate **how** the predictor-outcome relationship varies as the moderator changes. In other words you cannot interpret the interaction between moderator and predictor variable. To interpret the interaction a number of techniques can be used including 'tests of regions of significance', which is otherwise known as the Johnson-Neymar Technique.

2) *What does the test of 'regions of significance' do?*

The region of significance defines the specific values of the moderator at which the regression of the outcome 'y' on predictor variable 'x' moves from non-significance to significance. There are lower and upper bounds to the region. In many cases, the regression of outcome y on the focal predictor x is significant at values of the moderator that are less than the lower bound and greater than the upper bound, and the regression is non-significant at values of the moderator falling within the region. However, there are some cases in which the opposite holds (e.g., the significant slopes fall within the region). Consequently, the output will explicitly denote how the region should be defined in terms of the significance and non-significance of the simple slopes.

3) *How does the test of region of significance test translate back to the original scores?*

At each level of the moderator one can plot a simple slope of the regression of 'y' on 'x'. The region of significance test generates a series of simple slopes from low moderator values up to high moderator values. It also calculates a 't' score and a respective probability ('p') value for each simple slope at the different levels of the moderator (see blue box on SPSS output below). The greater the value of 't', the higher probability of a significant difference between the focal predictors variables (i.e. goals). When the probability 'p' is equal to or less than 0.05 this is the criterion normally set to indicate a significant difference between focal predictor variables and defines the upper and/or lower boundary of the 'region of significance' (see green boxes on SPSS output below).

The moderator values indicated by the SPSS output as the upper and lower boundaries of the 'region of significance' can be 'mean centred' (See red circle in SPSS output below). This is how they are initially reported in the results section of this study. In order to calculate the actual moderator values for the region of significance one needs to add the mean of the participants' scores on that particular moderator. The resulting figure is the value or values reported in brackets in the results section (see example extract below).

4) *Example of Translation from test of region of significance to original scores.*

The following results section extract relates to the SPSS output below –

'For CSW Approval from others, at values below -2.56 (CSW Approval scores of between 0 and 2.25) the effect of condition was significant (p=.05) in the direction of higher levels of Sadness Post anagrams in the Mastery Group, and at values of and above 0.06 (CSW Approval score ≥ 4.87) the effect of manipulation was significant in the direction of higher levels of sadness post-anagrams in the Performance Group.'

The initial figures '-2.56' and '0.06', reported in this extract are the mean centred moderator values that represent the upper and lower boundaries of the region of significance reported in the SPSS output (see red circle in SPSS output).
In this example the mean average moderator value is 4.81.
To calculate the actual lower boundary moderator value = mean average moderator value (4.81) + mean centred lower boundary value (-2.56) = <u>2.25</u>.
To calculate the actual upper boundary moderator value = mean average moderator value (4.81) + mean centred upper boundary value (0.06) = <u>4.87</u>.

From the SPSS output one can see moderator scores equal to and below the lower boundary (0 to 2.25) and equal to and above the upper boundary (4.87 and above) represent the region of significance (see green boxes on SPSS output below).

How do you interpret which condition's scores are significantly higher than the other condition for moderator values in the region of significance?

The direction of significance (e.g. participants in the performance goal condition are significantly *higher* than mastery goal condition) is indicated by the valency of the 't' value. For example, if the 'mastery goal' group are given a label of 1.00 and the 'performance goal' group are given a label of 0.00 (as was done to generate the SPSS output below), a positive 't' value indicates the mastery goal group's average outcome variable scores are higher than the performance groups. A negative 't' value indicates the opposite (see 't' scores in green boxes on SPSS output below). This can be further supported and confirmed by drawing a simple slope at the values of the moderator in which a significant difference between focal predictor variables (i.e. goals) are indicated by the test of region of significance.

Figure S1. A 'mean centred' test of regions of significance SPSS output.

Run MATRIX procedure:

Moderator Value(s) Defining Nonsimultaneous Johnson-Neyman Significance Region(s)

-2.5564
0.0593

> The moderator's 'mean centred' upper and lower boundaries of the regions of significance

Conditional Effect of Focal Predictor at Values of Moderator Variable

CSWappro	b	se	t	p	LLCI(b)	ULCI(b)
-2.6095	2.4396	1.2071	2.0210	0.0481	0.0214	4.8578
-2.5564	2.3754	1.1857	2.0033	0.0500	0.0000	4.7507
-2.3795	2.1614	1.1149	1.9387	0.0576	-0.0720	4.3948
-2.1495	1.8832	1.0237	1.8397	0.0711	-0.1675	3.9339
-1.9195	1.6051	0.9339	1.7187	0.0912	-0.2658	3.4759
-1.6895	1.3269	0.8460	1.5685	0.1224	-0.3678	3.0216
-1.4595	1.0487	0.7605	1.3790	0.1734	-0.4747	2.5722
-1.2295	0.7706	0.6785	1.1357	0.2609	-0.5886	2.1297
-0.9995	0.4924	0.6012	0.8189	0.4163	-0.7121	1.6968
-0.7695	0.2142	0.5310	0.4034	0.6882	-0.8495	1.2779
-0.5395	-0.0640	0.4707	-0.1359	0.8924	-1.0070	0.8791
-0.3095	-0.3421	0.4249	-0.8053	0.4241	-1.1933	0.5090
-0.0795	-0.6203	0.3983	-1.5573	0.1250	-1.4183	0.1776
0.0593	-0.7881	0.3934	-2.0033	0.0500	-1.5763	0.0000
0.1505	-0.8985	0.3950	-2.2744	0.0268	-1.6898	-0.1071
0.3805	-1.1766	0.4156	-2.8315	0.0064	-2.0091	-0.3442
0.6105	-1.4548	0.4567	-3.1857	0.0024	-2.3697	-0.5400
0.8405	-1.7330	0.5135	-3.3750	0.0013	-2.7616	-0.7044
1.0705	-2.0112	0.5814	-3.4592	0.0010	-3.1758	-0.8465
1.3005	-2.2893	0.6570	-3.4847	0.0010	-3.6054	-0.9733
1.5305	-2.5675	0.7379	-3.4797	0.0010	-4.0456	-1.0894
1.7605	-2.8457	0.8225	-3.4598	0.0010	-4.4933	-1.1980
1.9905	-3.1238	0.9098	-3.4334	0.0011	-4.9465	-1.3012

Regions of Significance

------ END MATRIX -----

Appendix T: Relaxation Script

GUIDED RELAXATION PROCEDURE [RELAXED CALM VOICE. SLOW DELIVERY AND SOUND MORE RELAXED THROUGH EXERCISE. CHANGE WORDS SLIGHTLY]

To begin with, I would like you to relax your body completely. It is easier to focus the mind when the body is relaxed. Make sure you are sitting comfortably on the chair so that you will be able to keep still for several minutes. I will begin by asking you to tense and relax each part of your body in turn. First, if you are happy to, close your eyes. Now focus on your breath for a few moments. [5] Your breathing should be deep and regular. [5] Breathe in…and out…nice and slow. [5]

I would like you first to focus on your legs. [5] Spend a few moments concentrating on the sensations coming from your legs. [5] Now tense the muscles in your legs as much as you can. Tense your legs while I count to 5. 1-2-3-4-5. Now let go and relax your legs completely. [5] Notice the difference between tension and relaxation. [5] Feel the tension in your legs draining away. [5] Focus on the feelings of relaxation in your legs. [5]

Nice slow breathing – long breaths in and long breaths out. Calm and relaxed. [5]

I would like you now to focus on your stomach. [5] Spend a few moments concentrating on the sensations coming from your stomach. [5] Now tense your stomach muscles as tightly as you can. Tense your stomach muscles while I count to 5. 1-2-3-4-5. Now relax your stomach completely – let go of the tension. [5] Notice how tension feels different to relaxation. [5] Feel the tension in your stomach draining away. [5] Focus on the feelings of relaxation in your stomach and legs as they strengthen and deepen. [5]

I would like you now to focus on your shoulders. [5] Spend a few moments concentrating on the sensations coming from your shoulders. [5] Now hunch and tense your shoulders as tightly as you can. Tense your shoulders while I count to 5. 1-2-3-4-5. Now relax your shoulders completely – let go of the tension. [5] Notice the difference between tension and relaxation. [5] Feel the tension in your shoulders draining away. [5] Focus on the deepening feelings of relaxation in your shoulders, stomach and legs. [5]

Continue to breath slowly and steadily. Calm and relaxed. Becoming more and more relaxed with each slow and gentle breath in…and…out. [5]

I would like you now to focus on your arms. [5] Spend a few moments concentrating on the sensations coming from your arms. [5] Now stretch out your arms in front of you as far as you can. Stretch your arms while I count to 5. 1-2-3-4-5. Now relax your arms completely – let them drop to your sides. [5] Notice the difference between tension and relaxation. [5] Feel the tension in your arms draining away. [5] Focus on the your arms, shoulders, stomach and legs as they become more and more relaxed. [5]

I would like you now to focus on your hands. [5] Spend a few moments concentrating on the sensations coming from your hands. [5] Now make your hands into fists and clench them as tightly as you can. Clench your fists while I count to 5. 1-2-3-4-5. Now relax your hands completely – let your hands open and unclench. [5] Feel the tension in your hands draining away. [5] Focus on the growing and deepening feelings of relaxation in your hands, arms, shoulders, stomach and legs. [5]

Keep your breathing calm, steady, and relaxed. More relaxed and calm with every breath. [5]

I would like you now to focus on your face. [5] Spend a few moments concentrating on the sensations coming from your face. [5] Now screw up your face as tightly as you can. Screw up your face while I count to 5. 1-2-3-4-5. Now relax your face completely – feel your face loosen and unwind. [5] Feel the tension in your face draining away. [5] Focus on the feelings of relaxation spreading through your face, hands, arms, shoulders, stomach and legs. [5]

I would like you to focus on your whole body. [5] Spend a few moments concentrating on the sensations of relaxation from all over your body. [5] Relax your whole body completely, feeling the tension drain away as you sink deeper into relaxation. [5] Focus on the feelings of relaxation spreading throughout your whole body. [5] Focus on breathing regularly and deeply. [5] Concentrate on the feeling of becoming more and more relaxed. [20]

Now spend a few moments concentrating on slow, gentle breathing, as you continue to feel calm and relaxed. [30]

As you hear me count from 1 to 5, feel more and more relaxed. Feel this state of complete relaxation deepen and strengthen. On 5, return your attention to the room around you, holding onto these helpful feelings of relaxation. These feelings will stay with you throughout the day, to help when difficulties or problems arise. 1–2–3–4–5