

THE RESPONSIVENESS OF NEGATIVE COGNITIVE CONTENT TO AN INDUCED NEGATIVE MOOD STATE IN THOSE WITH AND WITHOUT A PREVIOUS HISTORY OF DEPRESSION IN A STUDENT SAMPLE

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ABSTRACT

This study investigates the responsiveness of cognitions to an induced negative mood state in those with and without a previous history of depression in a non-clinical student sample (n = 101). The Automatic Thought Questionnaire (ATQ-30) was used to observe the negative cognitive content. The negative mood state was induced in small groups utilising the Velten Negative Mood Induction Procedure (VNMIP). Self-reported mood was measured using the University of Wales Institute of Science and Technology (UWIST) Mood Adjective Checklist (UMACL) before and after VNMIP. The effects of previous history of depression (without history or with previous history of depression) and self-reported mood (pre or post negative mood induction) on cognitive content was shown in a 2 x 2 ANOVA with time (pre-test vs. post-test) as a within subjects factor and history of depression (with a history of depression vs. without a history of depression) as a between subjects factor. The results indicate no significant interaction between time and group in their effects on negative cognitive content. Also, there was no significant main effect for time on negative cognitive content. However, there was a significant main effect for previous history of depression on negative cognitive content. Findings are discussed on the basis of the literature and possible applications for practice.

Keywords: Automatic Negative Thoughts; History of depression; Mood Induction Procedure (MIP) and Cognitive Behavioural Therapy

1.0 INTRODUCTION

Cognitions impact on the way we feel and have been pivotal in devising cognitive treatment strategies for people with emotional disorders. There is a patient preference for cognitive based talking therapies rather than pharmacotherapies, as the latter has known side effects including weight gain, constipation and sometimes decrease in libido (Gotzsche, 2014). Cognitive and behavioural treatments have been shown to work for a variety of emotional disorders, including depression (Cuijpers, Smit, Bohlmeijer, Hollon & Andersson, 2010). However, there is lack of specificity of how these strategies might be affected by previous episodes of depression (Vittengl, Clark, Dunn & Jarrett, 2007). It would seem that questions still remain on how mood state and previous history of depression might impact on cognitions.

Cognitions have an important influence on the way we our feel and behave. Beckian theory suggests that our thoughts are fundamental in understanding our everyday feelings and behaviour. There are three levels of cognition that have been suggested. The surface level has become known as automatic thoughts and seem to enter our consciousness in response to internal or external cues. It was observed by Hollon & Kendell (1980) that a higher frequency of negative automatic thoughts were associated with certain mood states like depression. The authors developed the Automatic Thoughts Questionnaire (ATQ-30) to measure these negative self-statements that were associated with depression. The intermediate level cognitions are called underlying assumptions and seem to reflect a more stable cognition than automatic thoughts and might be seen as a personality characteristic. The deepest level of cognition is the core beliefs of the individual which is seen as the least conscious and accessible aspect of thought processes. These core beliefs are hypothesised to have developed early on in the individual's developmental history. It is assumed that higher frequencies of automatic negative thoughts reflect activation of core beliefs and dysfunctional assumptions. Beck (1976) argued that latent dysfunctional assumptions and unhelpful core beliefs represent an ongoing vulnerability for future depression.

Beck's Vulnerability Theory

Beck's (Beck, 1976; Beck, Emery & Greenberg, 1986) cognitive model suggests that schemas are trait-like and play a role in instigating future depressive episodes. The Beckian model suggests that the presence of cognitive bias should be apparent in people who later go on to develop depression (Beck, 1976). It also suggests that certain cognitive characteristics are not only displayed when depressed but remain even when the depressive symptoms are in remission (Lewinsohn, Steinmetz, Larson & Franklin, 1981). This vulnerability theory suggests that previous episodes of depression predispose a person to

developing future episodes. The argument suggests that negative thoughts that have developed through previous episodes can lead to future depressed mood, which increases the activation of negative schema, which in turn leads to more negative automatic thoughts and greater negative mood (Beck, 1976). It is hypothesised that core beliefs and dysfunctional assumptions are acquired during childhood, which renders people vulnerable to future depression. These cognitions lay dormant until activated by internal mood states. Outside stressors also interact with specific cognitive vulnerabilities to trigger depression (Clark, Beck & Brown, 1989) through a network of mood state effects on cognition.

Network Theories of Affect

Bower (Bower, 1981 & 1991) argues that mood state findings can be explained by a Network Theory of Affect. Mood state is thought to affect the manner in which cognitions are recalled by facilitating the activation of similarly affectively toned cognitions (Forgas, 1995). There are two theoretically important mood state phenomena that contribute to our understanding of mood effects on cognitive recall: mood dependent and mood congruent processing effects.

The former phenomenon, mood dependent effect, is where the mood state at recall matches the mood state at the time the event was experienced, and is more easily remembered (Kenealy, 1986). According to this, retrieval will be more likely while experiencing the same affective state that was experienced when the memory was encoded. The latter phenomenon, mood congruence, is where a certain mood will tend to enhance processing of cognitions that correspond to the concurrent mood state (Teasdale & Fogarty, 1979). This effect shows an influence of emotion at the retrieval stage; when a person is in a particular mood, they will tend to recall information that is congruent with the concurrent mood. In both cases it is thought that mood state at the time of the event and at recall acts like a filter to particular cognitions. Both state dependent and mood congruent findings show the influence that mood can have on activating certain cognitions.

Mechanism of Cognitive Activation

An important feature of cognitive theories of depressogenic cognitions is that they remain latent until activated by an environmental stressor such as primed mood or adverse life event (Beck, 1970). Once the depressogenic cognitions are activated, they negatively bias information processing which causes depressed mood (Beck, 1970). Theory proposes that depressogenic cognitions need to be activated by an external stressor to produce negative affect. Miranda, Gross, Persons & Hahn (1998) propose that the stressor is negative mood state, which activates a variety of negative automatic thoughts. These act as facilitators in bringing about depressed symptomatology. The cognitive facilitators are considered to be unstable and surface level cognitions that “effect an independent variable on a dependent

variable by various transformation processes inside an active organism” (Kwon & Oei, 1994, p.336). This process of activation works on latent depressogenic cognitions which reinforces the current mood state and can instigate longer term negative mood and trigger depression (Beck, 1976).

Depression and Negative Mood States

Depression and negative moods are closely linked but are not necessarily the same. Negative mood is dominated by high tense arousal with other components of mood such as anger / frustration being raised and corresponding low levels of energetic arousal and hedonic tone is predominantly seen as a short-lived response to everyday stressors. Depressed mood is predominantly seen as longer in duration and dominated by low hedonic tone and associated with low levels of energetic arousal (Matthews & Southall, 1991). Depressed mood can be seen as more stable and has greater global impact on the individual's mood (Baas, De Dreu & Nijstad, 2008). Investigating the mood state effects evoked by mood induction techniques is an essential aspect of discovering mood effects on cognitive recall but a clearer understanding of important mood state phenomena could provide a theoretical understanding to any mood state effects observed in cognitive content. The induction of a sad mood seems to facilitate or prime negative cognitions. Dent & Teasdale (1988) studied previously depressed and never depressed individuals and induced dysphoric and neutral mood, and found that the previously depressed individuals demonstrated stronger activation of negative self-schema. The observation by Dent & Teasdale (1988) suggests that mood induction activates depressogenic cognitions in the previously depressed but the activation doesn't seem to work for the never depressed individuals, which supports the 'differential activation' hypothesis. The differential activation hypothesis (Teasdale, 1983) suggests that individuals with a previous history of depression have particular unhelpful cognitions, reinforced during the depressive episode, which can be triggered by negative mood state. Two hypotheses can be created for investigation in this study.

Hypothesis #1 Bower's (Bower 1981) associative network theory predicts that induced negative mood will result in an increase in negative thoughts in a congruent direction with the induced negative mood state. This theory indicates that cognitive activation will co-occur with negative mood state, regardless of how that negative mood state is caused.

Hypothesis #2 Beck, Rush, Shaw & Emery (1979) schema theory predicts that latent cognitions from previous episodes of depression should be activated by negative mood state in those with previous history of depression but not those without. However, the theory

further suggests that temporary mood change would have little effect in the absence of current depressive symptoms. This theory indicates that cognitive activation is to do with some aspect of the depressive syndrome.

2.0 METHOD

2.1 Participants

A total of 101 University students (89 female and 12 male) participated, the mean age was 26.8 years (SD = 8.41; range 18-50 years).

2.2 Measures

Beck Depression Inventory (BDI-II, Beck, Steer & Brown, 1996)

The 21- item Beck Depression Inventory (BDI-II, Beck, Steer & Brown, 1996) was used to assess the level of depressive symptoms and to screen out those with depression for their protection. Participants scoring 13 or above on the BDI-II were excluded from the study as recommended for non-clinical undergraduate students (Dozois, Dobson, and Ahnberg, 1998). The BDI-II has demonstrated good internal reliability, reliability and validity (alpha = .82, test-retest reliability between .65 and .72; Vazquez & Sanz, 1991).

Automatic Thoughts Questionnaire (ATQ-30, Hollon & Kendall, 1980)

The Automatic Thoughts Questionnaire (ATQ-30; Hollon & Kendall, 1980) was used to assess negative cognitions. The measure assesses the frequency of automatic thoughts associated with depression. Participants rate 30 questions on a 5-point Likert scale indicating frequency (1 = not at all, 5 = all the time). Scores range from 30 to 150, with a high score indicating frequent occurrence of negative automatic thoughts. The ATQ-30 contains four sub-scales of personal maladjustment and desire for change, negative self-concept and negative expectations, low self-esteem and giving up/helplessness. The ATQ-30 has alpha = .96 (Hollen & Kendall, 1980).

History of Depression (Persons & Miranda, 1992)

Participants self-reported a history of depressive symptoms on a questionnaire asking about history of depression and treatments received. Those who had received previous treatments, such as pharmacology, cognitive behavioural therapy or counselling, were considered to have a history of depression and those who had not and were without a current history were classified as without a history of depression. The proxy for previous history of depression is

similar to Persons & Miranda (1992) questionnaire to identify those with a previous episode of depression.

Mood State Assessment (UWIST-UMACL, Matthews, Jones & Chamberlain, 1990)

The University of Wales Institute of Science and Technology – UWIST and Mood Adjective Checklist – UMACL (Matthews, Jones & Chamberlain, 1990) was selected due to its ability to assess general non-clinical mood states and its sensitivity to external stressors (Matthews et al., 1990). The UMACL measure consists of a 29-adjective checklist with each item on a 4 point Likert scale. Three factorial scales include Energetic Arousal (EA), Tense Arousal (TA) and Hedonic Tone (HT). The UMACL has good internal reliability for non-clinical mood variations (Matthews et al., 1990).

Cued Memory Questionnaire

The cued memory questionnaire was a modified version of the paradigm used by Williams & Broadbent (1986). Participants rated four memories cued by neutral words. Each memory was rated on a 7-point Likert scale (ranging from –3 to +3). Results are not discussed in this study.

Mood Induction Procedure

The Velten (Velten, 1968) technique was used to induce a temporary negative mood state in participants. This procedure involves participants reading a list of 60 graduated self-referent statements with negative themes. The current study administered the Velten technique to small groups of approximately 20 participants. The participants were asked to read each word, which was shown for approximately 10 seconds on a white screen. The Velten technique seems to be an effective technique in a group procedure in producing a depressed mood state (Bates, Thompson, Flanagan, 1999).

Procedure

Participants were recruited following ethical permission from various cohorts at a Higher Education institution in the United Kingdom. All participants were informed that the purpose of the study was to explore thoughts in relation to history of depression. Participant information sheet was provided and informed consent was obtained. The participants then responded to an invitation to attend and complete five questionnaires, BDI-II, ATQ-30, Cued memory questionnaire, history of depression and UMACL. Participants underwent the VNMIP and completed three further questionnaires, UMACL, cue memory questionnaire and ATQ-30. The procedure was completed in 60 minutes and followed by a debriefing session.

3.0 RESULTS

3.1 Mood Manipulation Check

As expected, following the negative mood induction participants reported a significant increase in sadness on energetic arousal and hedonic tone from before to after the VNMIP ($F(1, 99) = 37.04, p < .001$ and $F(1, 89) = 32.08, p < .001$ respectively). Tense arousal was non-significant ($F(1, 95) = 0.97, p = .326$) but the lack of significance in this factorial scale was less important, as depression is mainly characterized by low hedonic tone and low arousal, which were both significant and in the expected direction. The pre mood induction means for the ATQ-30 was 42.12 (SD = 10.3) and BDI-II was 5.7 (SD = 3.6). Table 1 shows the Independent t-test for pre and post mood induction ATQ-30 scores with means, standard deviations and numbers with and without a history of depression.

3.2 Mixed Repeated ANOVA

It was hypothesized that there would be a difference in the ATQ-30 scores in those with and without a history of depression. To test this hypothesis, a mixed effects ANOVA was completed, predicting a larger increase in ATQ-30 scores from pre to post in those with a previous history of depression but not in those without a previous history. The ATQ-30 scales and its four sub-scales were each tested in a 2 (time; pre mood rating, post mood rating; within Ss factor) by 2 (group; with a previous history of depression, without a previous history of depression; between Ss factor) mixed ANOVA to observe any interaction effects.

The ANOVA on the ATQ-30 scale revealed a non-significant interaction between time and group in their effects on ATQ-30 ($F(1, 92) = 0.31, p = .58$), as such that the previous history of depression group experienced no significant increase in ATQ-30 scores from pre to post manipulation when compared to the without history of depression group. A non-significant main effect was observed for time on ATQ-30 ($F(1, 92) = 0.53, p = .47$) but the main effect for previous history of depression on ATQ-30 was significant ($F(1, 92) = 4.16, p = .04$), suggesting that those with history of depression experienced more negative automatic thoughts, compared to the without history of depression group.

The Personal Maladjustment and Desire for change (PMD) subscale of the ATQ-30 revealed a non-significant interaction between time and group in their effects on PMD ($F(1, 92) = 1.27, p = .26$), as such that the previous history of depression group experienced no significant increase in PMD scores from pre to post manipulation compared to the without history of depression group. A non-significant main effect was observed for time on PMD ($F(1, 92) = 0.31, p = .58$) but the main effect for previous history of depression on PMD was significant ($F(1, 92) = 5.56, p = .02$), suggesting that those with history of depression

experienced more negative automatic thoughts on PMD, compared to the without history of depression group.

The negative Self-Concept and negative Expectations (SCE) subscale of the ATQ-30 revealed a non-significant interaction between time and group in their effects on SCE ($F(1, 92) = 0.27, p = .60$), as such that the previous history of depression group experienced no significant increase in SCE scores from pre to post manipulation compared to the without history of depression group. A significant main effect was observed for time on SCE ($F(1, 92) = 4.41, p = .04$) but the main effect for previous history of depression on SCE was non-significant ($F(1, 92) = 1.78, p = .19$).

Table 1. Independent t-test for equality of means pre and post mood induction ATQ-30 scores

	Pre Mood Induction		t-test	p	Post Mood Induction		t-test	p
	Without (n = 74) M (SD)	With (n = 27) M (SD)			Without (n = 74) M (SD)	With (n = 27) M (SD)		
ATQ-30	40.5 (9.5)	46.6 (11.4)	-2.70	.008	41.0 (10.9)	45.4 (13.6)	-1.63	.106
PMD	7.2 (2.8)	8.9 (2.2)	-3.32	.001	7.5 (2.4)	8.5 (2.7)	-1.74	.084
SCE	9.4 (2.6)	10.5 (3.2)	-1.82	.072	9.2 (3.0)	10.0 (3.3)	-1.07	.288
LSE	2.3 (0.6)	2.3 (0.7)	-0.29	.776	2.3 (0.8)	2.3 (1.0)	-0.12	.906
GUH	2.5 (0.9)	2.7 (0.9)	-1.01	.317	2.6 (1.0)	2.8 (1.1)	-1.09	.281

Note: M = Mean. SD = Standard Deviation. Without = without a history of depression. With = with a history of depression. ATQ-30 = Automatic Thoughts Questionnaire, PMD = Personal maladjustment and desire for change, SCE = Negative self-concept and negative expectations, LSE = Low self-esteem, GUH = Giving up/helplessness.

The Low Self-Esteem (LSE) subscale of the ATQ-30 revealed a non-significant interaction between time and group in their effects on LSE ($F(1, 92) = 0.02, p = .97$). There were also no significant main effects for time ($F(1, 92) = 0.40, p = .53$) and for history of depression ($F(1, 92) = 0.03, p = .87$). Similarly, Giving Up/Helplessness (GUH) subscale of the ATQ-30 revealed a non-significant interaction between time and group in their effects on GUH ($F(1, 92) = 0.20, p = .66$). There were also no significant main effects for time ($F(1, 92) = 0.33, p = .57$) and for history of depression ($F(1, 92) = 1.16, p = .29$).

4.0 CONCLUSION

The present study addressed the question of whether cognitive content is affected by negative mood state and what factors other than mood might mediate the mood state effects in cognitive recall. Specifically, the present study investigated the effect of a temporary induced negative mood state on the frequency of automatic thoughts. The aim was to

assess whether cognitions following a negative mood induction procedure are sensitive to temporary mood change. The design enabled assessment of previous depressive episodes and the possible effects on accessibility of the cognitions pre and post mood stress. Miranda & Persons (1988) suggest that depressive cognitions are potentially inaccessible in those that are vulnerable until activated by negative mood. Beck (1996) argued that cognitive, affective, motivational, behavioural and physiological symptoms of depression are linked together as a 'mode'. These modes vary in activation, or what Beck (1996) called charge. They are highly charged during depression, but continue to exist after depression has remitted, with the mode being far less activated and charged. This mood state hypothesis has been advanced by Persons & Miranda (1992) & Segal & Ingram (1994), and suggests that there are individual differences that exist in the availability of modes, but that the accessibility of these structures varies with and depends on negative mood for activation.

Bower's (Bower 1981) associative network theory suggests that accessibility of negative thoughts emerging from cognitive processes are intrinsically linked in an associative network joining cognitive content and mood. This theory would predict that mood change will result in negative content bias in a congruent direction with the induced mood. The findings in this study did not provide support for this theory. Hypothesis #1 predicted an increase automatic thought in both groups after a temporary mood induction. The non-significant findings indicated that this wasn't the case. The findings are also in contrast to previous cognitive reactivity research which generally found an association between negative mood and cognitions (Timbremont & Braet, 2004), but had a sample group with depressive symptoms rather than a previous history of depression group, which may account for the discrepant findings.

In contrast, Beck, Rush, Shaw & Emery (1979) alternative schema theory suggests that latent cognitions from previous episodes of depression are activated by negative mood states, and further suggests that temporary mood change would have little effect in the absence of prolonged depressive symptoms. This latter theory indicates that cognitive reactivity is to do with some aspect of the depressive syndrome. In hypothesis #2, those with a history of depression were predicted to hold significantly more negative automatic thoughts than those without a history of depression post negative mood induction. Contrary to predictions, non-significant changes were observed in the ATQ-30 scores. The results in this study did not differentiate those with and without depression on ATQ-30 scores post mood induction. This null finding provides support for hypothesis #2, which indicated that a temporary negative mood state would have little effect in the absence of current depressive symptoms. The interpretation suggests that automatic thoughts are non-responsive to the induced temporary mood state in the absence of prolonged depressive symptoms.

4.1 Limitations and Recommendations

While the study has strengths, there were some limitations that must be acknowledged in light of the present findings. A potential limitation is related to the small baseline differences in mood and automatic thoughts in the 'with' and 'without' previous depression groups. Despite this, it is unlikely that small baseline differences were influencing the findings in mood states and automatic thoughts. Although Hollon & Kendall (1980) did not suggest screening cut off scores for depression, they did report a mean of 76.9 (SD = 22.3) for depression and a mean of 48.6 (SD = 10.9) for non-depression; the pre mood induction means for the present sample was 42.12 (SD = 10.3) which clearly indicates minimal depressive symptoms. Additionally, the mean BDI-II score of 5.7 (SD = 3.6) clearly place the sample below the clinical cut off scores for depression. Due to these it seems unlikely that baseline differences accounted for the findings.

The other main limitation was the design involving induced mood state rather than clinically depressed mood state. It could be argued that participants exposed to the negative mood induction would have guessed the purpose of the study and produced responses in concordance with social desirability rather than a real mood state change. Again, this did not seem likely due to the component mood state changes observation during the manipulation check for mood change. Nevertheless the resultant interpretations have necessarily been reported with consideration of the cautions.

4.2 Implications

Future research would need to replicate the findings in this study before applying any practical implications. Clinicians could teach patients to monitor their automatic thoughts. A tried and tested way of achieving this is to record automatic negative thoughts in a thought diary. The idea is to identify unhelpful thoughts and replace these with more adaptive thoughts. Metacognition techniques could also be taught to help patients disengage from the negative automatic thoughts which seem to be a legacy of a previous history of depression.

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