Positive Mental Training: Efficacy, Experience and Underlying Mechanisms of a Health Promotion Intervention for Resilience and Wellbeing in the Workplace

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Declaration

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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Abstract

There is a growing interest in brief, low-cost workplace health promotion interventions for wellbeing, which target increasing resilience, mindfulness and positive appraisal. One such health promotion intervention is Positive Mental Training. Three linked studies set out to investigate the efficacy of Positive Mental Training in the workplace. Study 1 used a double blind, randomised control trial design, with healthy volunteer employees randomised to intervention or control conditions. Validated questionnaires measured wellbeing, resilience, mindfulness, burnout and emotional distress at 4 time intervals, over a 6 month period. Multi-level linear modelling showed significant effects of the intervention on wellbeing and depression. ANCOVA analysis revealed these benefits were not sustained at follow up (26 weeks). Study 2 expanded on study 1, with qualitative interviews of purposefully selected participants of study 1. A grounded theory approach was used to explore individual motivations, benefits and limitations of the programme. Study 3 adopted a component research design to investigate one possible underlying aspect of this multi-component health promotion intervention (positive appraisal suggestion) in a student population and examined whether relaxation increased this effect. Positive appraisal suggestions given with or without relaxation were both able to significantly increase levels of positive affect and self-esteem compared to a control. Positive cognitive bias was found to increase in both the active conditions and the control suggesting differential cognitive and emotional processes, in that an increase in positive CB was not associated with an increase in mood. Overall these studies indicated evidence for the efficacy of Positive Mental Training in workplace health promotion, explored experience of participants undertaking the study and investigated the underlying mechanisms of an active component of Positive Mental Training. Theoretical and clinical implications are discussed.

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Overview of thesis

This thesis falls into three sections: Each section relates to a research study investigating the use of a mental health promotion programme, Positive Mental Training, as an intervention to promote wellbeing and resilience.

1) Study 1 employed quantitative methodology to evaluate a mental health promoting programme, Positive Mental Training, in the workplace. Healthy volunteers were recruited and randomised to intervention or control conditions, described as verbal relaxation training and music relaxation training. The intervention was a 12 track multicomponent audio programme, incorporating relaxation, suggestion and visualisations, and the control condition was the background music of the intervention. A longitudinal study design was adopted with validated questionnaires measuring the outcomes of interest at 4 time intervals, pre, during, post and at 6 month follow up. Results were statistical analysed. Outcome variables, were identified from the literature review, a process of 'operationalisation'. This is consistent with the experimental methodology and facilitates a shared understanding, within the scientific community, making this research more easily understood and its contribution more easily identifiable.

2) Study 2 expanded on and developed study 1, by employing qualitative methodology. This methodology evaluated the intervention through exploration and generation of concepts and theories from employees' experiences of their participation in study 1 which allowed capture of data not present within the quantitative methods of study 1. A grounded theory approach was adopted and semi-structured interviews were carried out on purposively selected participants from both the control and intervention groups from study 1.

3) Study 3 further extended study 1 and study 2 by adopting a component research design to investigate the effect of a single component, of this multi component health promotion intervention. The component of study was positive appraisal suggestion which was investigated with and without relaxation, and compared to a control. Measures of emotionality and underlying cognitive biases were examined. Additionally psychological resilience to a stressor was tested. A student population was used in a university setting.

1 Introduction

'Mental health and well-being are fundamental to quality of life' – WHO 2005

This introduction presents the reasons for and challenges herein for promoting individual psychological resilience and wellbeing in the workplace. It begins by outlining the extent of mental distress with specific reference to the workplace, and thus establishes the pressing need for effective preventative strategies. This is followed by a critical review of the relevant literature that lays out the concepts which define the areas of interest. This takes the form of firstly considering stress at work and current management approaches to this. There follows a description of common mental health disorders, and the concept of burnout. The introduction then introduces positive mental health and its constituents, wellbeing and resilience. There follows a critique of mental health interventions at work and then a description of the mental health promotion programme, Positive Mental Training and the rationale for its use. The section finishes with a description of the research framework and hypotheses.

1.1 Scope of mental distress

The World Health Organisation has declared mental health to be the *'foundation for well-being and effective functioning for both the individual and the community'* (WHO, 2004, p.12*)* and defined it as a state *'which allows individuals to realise their abilities, cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their community'* (WHO, 2004, p. 59).

However depressive disorders have been identified as the second most common cause of disability worldwide, according to the Global Burden of Disease 2010 study (Ferrari *et al.*, 2013). Additionally these researchers noted that clinical depression also contributed separately to the burden of suicidality and coronary heart disease. These findings highlight depression as a public health priority and emphasise the importance

of developing and implementing cost effective interventions to reduce the burden of this condition.

In Europe it has been estimated, from data from all 27 European Union countries, that every year over a third of the population experience mental health disorders (Wittchen *et al.* 2011). They estimate that less than one third receive treatment; a similar figure has been reported in the UK (McManus *et al.* 2007), and conclude that there is a need for increased research to find better strategies for prevention and treatment of mental health disorders. The approach investigated in this thesis, to offer employees resilience building programmes, may offer such a solution.

In Britain, the 2007 Adult Psychiatric Morbidity survey, estimated that at any one time, 1 in 6 adults will have a common mental health disorder, (McManus *et al.* 2007). Common mental health disorders (CMDs) have been defined as '*mental conditions that cause marked emotional distress and interfere with daily function*' (McManus *et al.* 2007, p. 25) and is a collective term for the different types of anxiety and depression. Incidence is higher among women and in people aged 45-54 years. There is however a lack of consistency and consensus in documenting and describing common mental health distress or disorders, particularly with reference to the inclusion of stress. For example the British Occupational Health Research Foundation (BOHRF) (Seymore & Grove, 2005), in their systematic review of common mental health problems at work, used a definition of CMDs that did not include stress, however the studies included in this review commonly referred to stress-related disorders. For the purpose of this current study the term psychological distress was used to include stress, anxiety and depression. Other surveys include stress along with anxiety and depression, such as the Labour Force Survey, which surveys 60,000 adults, annually collating self-reported work related illness, the commonest being musculoskeletal, followed by stress, anxiety and depression. In 2011/2012 over half a million people reported work stress at a level that was making them ill, resulting in 10.4 million lost working days from stress, depression and anxiety (HSE, 2012). This source of

information may represent an underestimate, perhaps due to survey design, respondent bias and the changing nature of work, e.g. attributing illness to part-time work may be more problematic. The Bristol Stress & Health at Work study reported a greater number, over 5 million people (one in five workers) that feel 'very' or 'extremely' stressed by their work. A survey from a different perspective, of trade union safety representatives, reported that the number of workplaces citing stress as their most common concern, had risen by 2% in two years, to 58%, representing three in five workplaces (TUC 2004). Clearly, however psychological distress is measured, there is consensus that the extent of the problem even at lower or conservative estimates is considerable, and that this results in significant costs to individuals, employers and society.

Costs to the UK employer have been estimated to be significant - £26 billion/year, or £1,035 for every employee. This estimate includes sickness absence and reduced productivity of those who remain at work whilst ill (presenteeism) (SCMH, 2007). Researchers, on examining the relative cost to the employer of 10 modifiable health risk found that depression had the highest associated costs (Goetzel *et al.*, 1998). The other risk factors were smoking, excessive alcohol intake, being overweight, high blood glucose, high stress, sedentary lifestyle, high cholesterol, poor diet and hypertension. They found that depressed employees cost their employer 70% more than non-depressed employees; that those with unmanageable stress cost 46% more than non-stressed colleagues and those with both stress and depression the increase was 147% (Goetzel *et al.*, 1998). Other researchers have estimated that depressed workers' productivity is about 20% less, caused by poor concentration, lack of self-confidence and fatigue (Greenberg *et al.* 1993). These estimates are limited in that they do not take account of the impact of the absenteeism on the mental health of co-workers, nor do they include wider societal costs associated with ill health, such as caring and days or skills lost to the workforce and health care costs.

1.2 **Unmet need of psychological distress**

The Adult Psychiatric Morbidity survey found that on average only 24% of those with CMD were currently receiving treatment, a treatment rate that dropped to 15% for those with mixed anxiety and depressive disorder (McManus *et al.* 2007). This indicates the extent of undiagnosed depression and anxiety in society and the large numbers of those with significant mental distress that do not attend health professionals. This study, as with earlier national surveys provided a cross sectional snapshot of the CMDs in the population and as such gave no information on the progress and duration of mental health disorders. Longitudinal studies address this and a follow up of individuals interviewed in the 2000 Psychiatric Morbidity Survey found that 18 months later 38% of those with CMDs had recovered while 11% of the total sample had developed a CMD (Singleton & Lewis, 2003). Predictors of onset of CMD were found to be living in rented accommodation, and experiencing stressful events, i.e. those who experience over 3 stress events within the 18 month survey period had an increase in onset of CMD from 3 % to 22% in women, and 17% in men. However the strongest predictor for onset was sub-clinical symptoms in the 2000 survey. This supports the view expressed by Keyes (2002) that although CMDs are clinical conditions, mental health can be conceptualised as on a continuum wherein any deficiency in good mental health is associated with a greater risk of depression. The concept of health as a continuum is one that is particularly helpful for mental health. CMDs are conditions that are defined by symptoms that represent a level at which clinical caseness is present. However as indicated by the Adult Psychiatric Morbidity Survey many CMDs are untreated and may well be undiagnosed, and this, along with sub-clinical conditions, indicates a substantial level of mental ill-health in the community. Given that there is still stigma attached to diagnosis of depression and anxiety, particularly in light of the new expanded diagnostic criteria of the American Psychiatric Association (DSM V), its rejection by the National Institute for Mental Health (NIMH, 2013) [America's main funder of mental health research] and that there is debate about the value of diagnoses (Timimi, 2011), it may be more helpful to talk of psychological distress in terms of stress and to address it in a non-stigmatising manner. The next section will describe stress with specific reference to stress at work.

1.3 **Stress**

1.3.1 **Defining Stress**

Stress is a term used to define the body's response to stressors, either internal or external (Patel, 1989). Although not all stress is harmful, the term as it is used here in this thesis, relates to the negative effects of having too much stress, or the having symptoms of stress.

Lazarus in his review (1993, p. 4) describes four basic concepts of the stress process; 1. A causal agent (internal or external); 2. An evaluation (by mind or body); 3. Coping process by mind or body; and; 4. A complex pattern of effects on mind and body, often referred to as the stress reaction. From this it can be understood how exposure to a stressful experience may lead to physiological and psychological distress, including anxiety or depression.

Stress has been also proposed to be a specific emotional state (Clark & Watson, 1991; Henry & Crawford, 2005; Lovibond & Lovibond, 1995). In their factor analysis of a scale to identify and discriminate between anxiety and depression symptoms, Lovibond & Lovibond (1995) found that a unique third factor emerged, in addition to the depression and anxiety factors. This third factor, became the Stress scale within their Depression, Anxiety and Stress Scale (DASS: Lovibond & Lovibond, 1995), and consists of items that assessed irritability, restlessness, nervous tension, agitation, difficulty relaxing, and low frustration tolerance. The concept of a third independent factor within the spectrum of anxiety and depression also concurred with the tripartite model of anxiety and depression (Clark & Watson, 1991) which proposes that anxiety and depression share a nonspecific affect component that encompasses generalised distress but are distinguished from that component by physiological hyper-arousal specific to anxiety and low positive affect, specific to depression. The stress component of the DASS has also been found to reliability reflect worry within a non-clinical population further supporting that stress is distinguishable from general distress (Szabo, 2011). Matching the DASS stress subscale scores to a well-established worry questionnaire - Penn State Worry Questionnaire (PSWQ) and to diaries, this

researcher found that results of hierarchical multiple regressions revealed that the DASS stress subscale explained a significant amount of variance in worrying over and above the variance explained by depression and anxiety, in both the self-completion questionnaires and the diaries (Szabo, 2011).

1.3.2 Work related stress

Work - related stress has been defined by the Health and Safety Executive (HSE, 2012) as '*a harmful reaction that people have to undue pressure and demands placed on them at work.'*

There is a considerable body of research that has identified stress as a major contributing factor to ill health, particularly psychological health (Cartwright & Cooper, 2005; Lunt *et al.* 2007; Melchior *et al.* 2007) One of the earliest, and probably most impactful work and health study, is the Whitehall Study. The first study, Whitehall I, followed a cohort of civil servant employees for 10 years from 1967 and the Whitehall II study started in 1985 (Marmot *et al.* 1978; UCL; 2013). Contrary to expectations of the time [that higher grades of management experience more stress], it was found that lower grade employees experienced greater stress, through low job control and greater job demands, with a correspondent greater coronary heart disease risk, compared with senior colleagues. The lower grade workers also had higher prevalence rates of risk factors, such as obesity, and smoking, which accounted for only 40% of the difference in increased cardiovascular mortality. (Bosma *et al.* 1997). Other studies have similarly found that workplace stress is significantly related to coronary morbidity and mortality, coronary vascular disease and stroke, for a review see (Backe, *et al.* 2012).

The job demand-job control model is a widely cited work stress model and proposes that work stress (strain) is a result of an imbalance between the demands of the job and job control with high demands and low control leading to stress (Karasek & Theorell, 1990). Job control has been hypothesised to consist of decision making and skill utilisation and job demands can be emotional, mental or physical (Karasek, 1989). Conversely this model also hypothesises that high job control and high job demand

will result in increased work motivation, learning and personal growth. A recent longitudinal study found that this model applied where the nature of the work was mental or emotional, and not physical, and that also that there was a significant relationship between low job control and psychosomatic health symptoms (De Jonge *et al.* 2010).

Another similar recent theory that also incorporates job demands is the job-demands-resources model (Schaufeli & Bakker, 2004). This theory proposes that work has both job demands and job resources. Job demands are those aspects that require physical and/or psychological effort, whilst job resources are those aspects of work which reduce job demands, help reach work goals and increase personal development. Job resources foster motivation, both extrinsic motivation, through attainment of goals, and intrinsic motivation, through work providing belongingness, competency and autonomy. Job resources are positively associated with work engagement. When job demands exceed job resources then health impairment can results. This process has been found to be mediated by burnout (Ahola & Hakaken, 2007; Hakaken *et al.* 2006). A three year longitudinal study of Finnish dentists found that job demands predicted burnout, which predicted future depression (Hakaken *et al.* 2008).

These theories emphasise the balance between demands and resources. Therefore interventions that can foster and increase the use of individual resources, such as psychological skills, may be useful, particularly in work contexts where reducing demands may not be practical or feasible.

1.3.3 Work related stress complaints

Work related stress complaints have been categorised as 'distress complaints', which are predominately anxiety and depression, and burnout (De Vente *et al.* 2008). These are reviewed below.

1.3.3.1 Burnout

Burnout was first defined in the 1980s by Maslach and Jackson as a *'syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment that can occur among individuals who work'* (Maslach & Jackson, 1981, p.1) and since then the Maslach Burnout Inventory (MBI) has become the 'gold standard' to measure burnout (Schutte *et al.* 2000). At the core of the concept of burnout is emotional exhaustion which describes feelings of being overextended, and drained of personal emotional and physical resources. Exhaustion represents the individual stress dimension of burnout and results in actions of emotional and cognitive distancing from work and has been identified as a significant factor influencing how satisfied patients are with their care (Vahey *et al.* 2004). Depersonalisation reflects this distancing and encompasses negative and cynical feelings and detachment towards clients. This aspect represents the interpersonal component of the concept. The development of depersonalisation depends on emotional exhaustion and therefore these two aspects are correlated. Reduced personal accomplishment is the third aspect of burnout which represents the self-evaluative dimension of burnout and refers to negative self-evaluation, and feelings of incompetency, particularly with regard to work performance with others. The concept of burnout represents a response to prolonged exposure to emotional and interpersonal stressors at work and is conceptualised as a continuum from low to high, rather than a dichotomous variable, i.e. present or absent (Maslach *et al.* 1996; Schaufeli *et al.* 2001).

There have been numerous studies into the relationship between health and burnout (for a review see Maslach *et al.* 2001). These have been carried out in many different work settings, originally within the human services industry and health care, i.e. with those professions that care for other people, and the MBI, known as the MBI Human Services Survey (MBI HSS: Maslach *et al.* 1996) was designed for this sector. However the measure was later adapted for education (MBI ES– educator survey) and for general use i.e. for those not directly involved with service recipients (MBI GS – general survey). The MBI GS assesses the same three constructs of burnout as the

original measure but with a broader conceptualisation of work, not limited to personal relationships within the job (Maslach *et al.*, 2001).

Maslach *et al.* (2001) in their review, report that burnout seems to be higher in younger people. It is also inversely correlated with hardiness, as well as internal locus of control, and self-esteem. Engagement is the antithesis to burnout and is conceptualised as an individual's relationship with their work, characterised by energy, involvement and efficacy. Burnout is particularly related to job demands (i.e. work overload, emotional demands) and engagement is particularly related to job resources, such as job control, support and learning opportunities. Burnout is understood to occur when demands exceed resources (Maslach *et al.* 2001). Resources have been broadly defined to encompass both aspects of work environment (i.e. autonomy, supervisory support) and aspects of personal resources that help manage the work environment (e.g. wellbeing, emotion regulation resources) (Lilius, 2012).

What helps recovery from burnout? There are many studies on individual coping (see Maslach *et al.* 2001 review) and fewer organisational studies addressing this. As burnout is a phenomenon that is related to work, it is generally thought that recovery involves non work activities; for example burnout has been shown to be influenced by restorative activities such as leisure time at weekends or evenings (Fritz & Sonnentag, 2005). More recently however, research focus has shifted to recovery in the workplace, and it has been shown that there are activities that can take place in work that can be restorative, e.g. work time breaks such as lunch (Trougakos *et al.* 2008) which enable employee wellbeing and reduce burnout. Other researchers have focused on personal resources and their ability to be restorative, for example increasing positive emotions (Thoman *et al.* 2011; Tice *et al.* 2007).

1.3.3.2 Depression & Anxiety

The toll of emotional psychopathology on health has been highlighted at the beginning of this thesis with the recent assessment that depression is the 2nd highest cause of mortality and morbidity worldwide.

Depression and anxiety are characterised by having high levels of negative affect, with depression being distinguished by low positive affect, and anxiety by physiological tension and hyperarousal (Clark & Watson, 1991). It has been estimated that 40% of those with depression also have a current anxiety disorder and 45% of those with anxiety have a concurrent depression disorder (Cassano *et al.* 2003).

1.4 Mental Health Promotion at Work

With almost 70% of working age adults in employment, it is recognised that the workplace can be an appropriate and effective setting for the prevention of common mental health conditions (Hill *et al.* 2007). Although there has been a 70% decrease in work-related injury, disease and death since the Health & Safety at Work Act (1974) was introduced, most of this has been due to the changes in work practice, with a risk management approach, the traditional approach to health in the workplace. Some evidence has suggested that the HSE management standards approach (a risk management approach) is effective. Using job satisfaction as a measure, amongst others, of job stress, research has found that the HSE management approach, measured by assessing the organisations performance against the standards, was inversely correlated with job related anxiety, depression, and positively associated with job satisfaction (Kerr *et al.* 2009) However the generalisabilty of this study is limited as only one workplace was surveyed, using self-completion questionnaires, with a response rate of 29%.

The risk management approach has been criticised by Lunt *et al.* (2007) in their review of occupational health strategies, as being poorly applied particularly to prevention of psychosocial conditions i.e. stress, depression and anxiety. They concluded that to optimise workers' wellbeing the risk management approach was not sufficient, as wellbeing is '*more than the absence of stress*' (p. viii). Taking a broader, biopsychosocial approach was recommended, which included ensuring the presence of wellbeing resources, such as increased social support, and positive health behaviours, such as access to healthy eating and exercise classes.

Accordingly there is now a shift to preventing illness and promoting wellbeing at work, which has led to an increased number of health related activities in the workplace (Black, 2008). Governments recommend employers implement policies (non statutory) to prevent and control work related stress (HSE, 2005, 2007a) and have commissioned many reports and reviews to inform their policies, e.g. (Harrop *et al.* 2009; Hill *et al.* 2007; Lunt *et al.* 2007). Despite this, the number of those stressed at work has not decreased and thus there is a need for effective workplace health promotion and increased understanding of the role this has to play in employee mental health and wellbeing.

The TUC 2004 report concluded that employers were failing to tackle the main occupational health challenges, of which stress was the key issue within most workplaces (TUC, 2004). The TUC 2010 report of safety representatives still cites stress as the most frequently identified workplace hazard and recognises that there is a ' *clear need for an integrated occupational health strategy, covering all areas from prevention to rehabilitation'* (TUC, 2010, p.42).

The European Network Workplace Health Promotion have a consensus definition of workplace health promotion (ENWHP, 2005, p. 1) it is

'*Workplace Health Promotion (WHP) is the combined efforts of employers, employees and society to improve the health and well-being of people at work. This can be achieved through a combination of:*

- *Improving the work organisation and the working environment*
- *Promoting active participation*
- *Encouraging personal development'*

A European report (Federal Institute for Occupational Safety and Health 2003) on best practice in workplace health promotion activity recommended that mental health promotion should be integrated into the company structure by using existing structures for identification (e.g. Occupational health staff and managers). They also advocated that both a 'top down' and 'bottom up' approach be utilised, meaning involvement at

both the management level, (focusing on optimising working conditions), and combined with individual level action to increase wellbeing, (such as boosting internal locus of control, facilitating social inclusion, developing coping strategies, reducing anxiety and depression).

Concurrent with the increased emphasis on health promotion at work, it is increasingly recognised that work can have a positive impact on developing good health and wellbeing. This is reflected in the Scottish Executive (2004) policy to advocate a 'healthy working life' – '*one that continuously provides working age people with the opportunity, ability and support and encouragement to work in ways and in an environment which allows them to sustain and improve their health and well-being*' (Scottish Executive, 2004, p. 11). This approach encompasses the recognition that health is not just the absence of disease; wellbeing is 'optimal psychological functioning and experience' (Ryan & Deci, 2001). Waddell and Burton (2006) in their review 'Is work good for your health and well-being?' conclude that '*there is a strong evidence base that work is generally good for physical and mental health and wellbeing,*' (Waddell & Burton, 2006, p. ix). However these studies have a health selection effect, most are short term in nature and do not look at long-term relationships. Also importantly the review considers average effects that mask those for whom work causes ill effects. Therefore although it is generally recognised that work is good for health and wellbeing, this does depend on the nature and quality of the work. The fact that the TUC 2010 safety executive report (mentioned above) included for the first time bullying/harassment as the second most commonly identified hazard (after stress), indicates the presence of unhealthy workplaces and emphasises the need to give employees the confidence and skills to change these toxic cultures.

However the general acknowledgement of the positives to be found in the workplace is a welcome shift to a more positive focus in general. Up until now though most interventions have been focused on diminishing negative measures of psychological distress, rather than accentuating the benefits of positive mental health. Building on Clark & Watson's (1991) observation that depression is characterised by the low

positive affect, there has been recent interest in developing approaches that increase positive emotions in order to aid recovery from mental dysfunction (Pictet *et al.* 2011).

Positive Mental Training is an intervention that adopts such a positive approach. This next section therefore, will describe positive mental health, its constituents, i.e. wellbeing and resilience, and the benefits of a positive mental health approach.

1.5 Positive Mental Health

Positive Mental Health refers to the conceptualisation of mental health in positive terms, through positive indicators of wellbeing (WHO, 2004). Positive mental health is a term which is used in the literature synonymously with mental wellbeing, or wellbeing. (Tennant *et al.* 2007). Other researchers have defined wellbeing as '*healthy, congruent, and vital functioning*' (Ryan & Deci 2001, p. 147).

1.5.1 Describing Wellbeing

In his influential review Diener (1984) identifies 3 aspects of wellbeing within the research literature.

1) Wellbeing as a normative standard against which an individual can be judged, wellbeing is the framework of the observer and not the individuals own evaluation.

2) Wellbeing as life satisfaction, i.e. as an individual's own evaluation of their life in positive terms. As such this view is based on an individual's own criteria of what is a good quality of life and is therefore a subjective evaluation.

3) Wellbeing focussing on having more positive emotions (positive affect) than negative affect and an individual's predisposition to experience positive affect, whether or not currently experiencing then. This view is also a subjective evaluation.

The latter two aspects are encompassed in subjective wellbeing (SWB) (Diener, 1984).

Another way of conceptualising wellbeing has been described by Ryan & Deci in their review of wellbeing (Ryan & Deci, 2001). These researchers identified two aspects of wellbeing – hedonism (pleasure and happiness) and eudaimonism (actualisation and fulfilling one's potential). Hedonism is the experience of pleasure, as opposed to displeasure in all areas of life, i.e. in both mind and body and can be thought of as subjective happiness or subjective wellbeing (SWB) and equate to the second and third aspects identified by Diener (above). Eudaimonism on the other hand expresses the view that wellbeing is more than happiness and encompasses individual actualisation and psychological functioning.

Ryan and Deci (2000) theorise that self-determination theory (SDT) comprises the core of eudaimonic wellbeing, through describing the attainment of self-actualisation. SDT states that there are three basic psychological needs – autonomy, competency and relatedness, and fulfilment of these needs is essential to psychological wellbeing and self-actualisation (Ryan & Deci, 2000). Where these requirements are not met, this will result in poor personal development and low psychological wellbeing. It is argued that different types of motivations or goals enhance or undermine these needs, with concomitant positive or negative effects. Intrinsic motivations, are those that are interesting and enjoyable in themselves, such as personal growth or enhanced relationships. Intrinsic motivations have been found to be positively related to greater physical and psychological wellbeing, whereas extrinsic goals, such as wealth, or fame, undermine wellbeing (Deci & Ryan, 2000; Kasser & Ryan, 1993, Kasser *et al.* 2007). However, the cross cultural relevancy of this theory has been questioned, as it has been argued that the basic premise of autonomy, as a universal need, may not be valid in all societies. SDT relates to Western cultures that are individualist in nature, which value the experience of autonomy, whilst other Eastern cultures value conformity and family interdependence and so may not experience the same benefits from satisfying this need (Jang *et al.* 2009).

Happiness, and positive mood, are terms used synonymously for SWB (Diener,1984). Happiness has been operationised by Seligman and colleagues into three concepts - positive emotion; engagement; and meaning. Their research suggests that the most

satisfied people are those who embrace all three, with engagement and meaning having the greatest weight (Seligman *et al.* 2005). However happiness and SWB research has been criticised as being too narrow, and not encompassing the broader aspects of wellbeing and therefore conditions that promote SWB may not necessarily yield eudaimonic wellbeing; that the hedonic search for happiness cannot be equated with wellbeing (Ryff & Singer, 1996).

However some measures of wellbeing capture this broader approach, by encompassing both SWB and eudaimonic conceptual perspectives (Tennant *et al.* 2007), thereby conceiving wellbeing in a wide inclusive manner, as '*healthy, congruent, and vital functioning*' (Ryan & Deci, 2001 p. 147), and thus helpful for assessing positive mental health therapeutic interventions.

1.5.2 Benefits of wellbeing

Wellbeing as noted above is a diverse category (Diener & Chan, 2011) but research into the benefits of wellbeing, usually focuses on SWB and falls into two broad areas – life satisfaction and positive affect, often measured as a single concept, to include these differing aspects.

Lyubomirsky and colleagues in their meta-analysis of 225 papers on happiness and wellbeing, found that happiness, or SWB is associated with a wide range of advantages associated with success (Lyubomirsky *et al.* 2005). (Here success was defined by societal attributes of good mental health and good relationships at home and work.) Longitudinal evidence suggest that it is happiness, that causes these successful outcomes, rather than happiness being a result of success. Similarly Diener and Chan (2011) in their review of the SWB literature concluded that there is compelling evidence that SWB influences health and longevity; that '*happy people live longer*.

SWB has been found to be characterised by a preponderance of positive emotions, positive affect (Lyubomirsky *et al.* 2005) and it is the amount of time spent feeling positive rather than the intensity of the experience that predicts self-reported happiness

(Diener *et al.* 1991). There is debate in the literature of whether there is a fixed 'set point' for SWB, i.e. an emotional point to which an individual returns after an emotional challenge. Evidence for this is seen in, for example, widows returning to previous states of wellbeing after death of a spouse (Bonanno *et al.* 2005). In addition, twin studies suggest there may be a heritable component (Bartels & Boomsma, 2009). Identical twins reared apart had more similar levels of SWB than non-identical twins reared apart (Tellegen *et al.* 1988). However it has also been proposed that set points differ between individuals and that an individual can have different 'set points' throughout life (Diener *et al.* 2006) and most importantly from the point of view of this current study that an individual's SWB can change (Diener *et al.* 2006; Tay & Kuykendall, 2013).

Characteristics of positive emotions include confidence, optimism, self-efficacy, self-esteem, activity energy, immunity and physical well-being, effective coping with challenge and stress, originality and flexibility, personal mastery and control (Lyubomirsky *et al.* 2005). Positive emotions lead people to think and act in ways that promote resource building and involvement with approach goals (Elliot & Thraash, 2002). They are in possession of past skills and resources which they have built over time during previous pleasant moods (Lyubomirsky *et al.* 2005). The characteristic one group of researchers found to have the highest correlation to happiness was affiliation, i.e. the inclination to relate to other people (De Neve & Cooper, 1998). This is reflected in other characteristics of positive emotion that have been observed such as likeability, positive construal of others, sociability and prosocial behaviour, as observed, for example, in the study that happy college woman were less likely to be hostile towards other women compared with women who were less happy (Cowan *et al.* 1998). Inducing positive emotions by manipulating unexpected rewards has been found to be associated with many cognitive benefits including (amongst others); creative problem solving; integration of ideas; ability to focus on important negative information when needed; cognitive flexibility, i.e. ability to swap perspectives between self and others; inclusive social grouping and generosity to self and others (for reviews see Isen & Labroo 2003; Isen, 2008), and most recently improvement in working memory (Carpenter *et al.*, 2013; Yang et al. 2013). A criticism of these studies is that they have

been carried out on an experimental basis, measuring short term outcomes and sustained effects have not been assessed. However longitudinal studies show that positive emotions have effects on physical health, associated with less incidence of physical illness and prolonged healthy life expectancy, reduced risk of stroke and coronary heart disease postulated as due to the demonstrable reduced levels of inflammatory biomarkers (infraleukin 6) (Brouwers *et al.* 2013, Di Bona *et al.* 2009) and promoting functional recovery if these events occur (Ostir *et al.* 2008).

1.5.3 Subjective wellbeing and work

There are numerous benefits to wellbeing in the workplace. Not only are happy employees less likely to experience job burnout and show counterproductive work behaviours, such as absence (Donovan, 2000; Thoresen *et al.* 2003; Wright & Cropanzano, 1998) and less interpersonal conflict at work (Van Katwyk *et al.* 2000), but they are also more likely to have greater job satisfaction (Connolly & Viswesvaran, 2000) and are likely to exhibit behaviours which help them perform better at work, as judged by their supervisors, (Cropanzano & Wright, 1999) or clients (DeLuga & Mason, 2000). Similarly SWB in an organisation climate has been correlated with increased productivity and profitability (Foster *et al.* 2004, *cited in* Lyubomirsky *et al.* 2005)

Not surprisingly happier people have been reported to show fewer symptoms of poor mental health, like depression & anxiety (Diener & Seligman, 2002) and those who are optimistic are less likely to participate in unhealthy behaviours such as smoking & drinking (Bogner, 2001)

Researchers (Ford *et al.* 2011) have also identified, from a meta-analysis of 111 different studies of health and work performance, that an individual's psychological health is moderately strongly correlated with their work performance. From these authors' analysis, it was revealed that positive psychological indicators, such as wellbeing were more strongly correlated with work performance, than negative

indicators of mental health, such as depression. However as this meta-analysis was based on correlational studies, causality is not known and it could be that work performance influences wellbeing. This meta-analysis had a single inclusion criteria - effect size between a health variable and an indicator of job performance. Whilst effect size is a good comparator between studies, the lack of other inclusion criteria questions the robustness of analysis. With 111 studies, there was a wide variation in methodology, influencing bias and effect size. However it is interesting to note the stronger relationship with positive health constructs, which reinforces the value of including these in research.

Similarly the Health and Employment Review on the research evidence on work related stress and ill health found that employee wellbeing was most strongly linked to job satisfaction (Faragher *et al.* 2005). These researchers found that job satisfaction was more strongly correlated with mental health than physical health and that employees with low levels of job satisfaction were most likely to experience mental health problems such as anxiety and depression, as well as experiencing reduced levels of self-esteem and 'burnout'. Job strain and job insecurity are aspects of job satisfaction that are encompassed within this concept and other researchers have similarly identified a strong link between job insecurity, job strain and health, both physical and mental (Kivimaki *et al.* 2012; Virtanen *et al.* 2013; Witte, 1999).

Job stressors are unlikely to lessen given the changing nature of work and the workplace (e.g. organisational restructuring, 'just in time' processes, short term contracts, 'zero hour' contracts, self-management and home working). All have the potential to increase stress, although for some, it may be that greater working flexibility may lead to less work demands (Cooper, 2006). To adapt to these evolving and potentially challenging work place patterns, employees may be well served by intervention programmes to develop resilience to protect their wellbeing. Any such interventions should be evaluated in well-controlled studies, in line with evidence based practice (Marine *et al.* 2009).

1.6 **Resilience**

According to the Oxford English Dictionary (2013) resilience is

1. *the ability of a substance or object to spring back into shape; elasticity:*
2. *the capacity to recover quickly from difficulties; toughness*

These definitions capture the concept that resilience in people is the ability to '*successfully adapt or 'bounce back' from stress or trauma'*, (Campbell-Sills *et al.* 2006, p. 586). However, within the literature there is no agreed definition of the construct of resilience (for reviews see Davydov *et al.* 2010; Fletcher & Sarkar, 2013; Herrman *et al.* 2011). Resilience has been defined as a trait, outcome or process. For example, resilience has been conceptualised as 'individual characteristics' (Block & Kremen, 1996) or 'protective factors' (Rutter, 1985); as '*good outcomes in spite of serious threats to adaptation or development*' (Masten, 2001, p.228); as '*a dynamic process encompassing positive adaptation within the context of significant adversity or trauma*' (Luthar & Cicchetti, 2000, p. 543); as a measure of emotional stability – '*an individual's stability or quick recovery (or even growth) under significant adverse conditions*' (Leipold & Greve, 2009, p. 41); or '*the ability to successfully adapt to stressors, maintaining psychological well-being in the face of adversity*' (Haglund *et al.* 2007, p. 889) Despite these differing operationalisations, there is within the construct of resilience two core concepts - risk (adversity) and positive adaptation.

Resilience research has been applied to individuals, families and communities (Becvar, 2013; Masten, 2001). However for the purpose of this thesis, this review is confined to individual psychological resilience. Much research in this area has focused on characteristics of those who have had been exposed to difficult circumstances once they have arisen e.g. terrorism (Fredrickson *et al.* 2003), pain (Friborg *et al.* 2006), cancer (Craver *et al.* 1993), loss (Bonanno, 2004), and measured the association of resilience with markers of positive functioning (e.g. coping) or negative functioning (e.g. anxiety) to determine the attributes of resilient individuals. Other researchers have focused on the development of resilience through either the removal of risk or, more recently in a shift to health promotion; the fostering of protective, psychological, factors to increase resilience.

There are relatively few measures of psychological resilience and fewer for measuring resilience in adults (Ahern *et al.* 2006). Some scales reflect the fact that resilience is a multidimensional concept by having subscales, but there are problems with these, not least that there is no agreement on the definition of resilience (White *et al.* 2008). The most widely used resilience scales are unidimensional, for example the ego resilience scale (ER) which conceptualises resilience as general resourcefulness, flexibility of functioning, and strength of character. (Block & Kremen, 1996). However this scale was designed to measure resilience as a stable construct. Alternatively the Connor & Davidson resilience scale (CDRISC) (Connor & Davidson, 2003) was designed to measure the ability to cope with stress and to capture change in an individual. This unidimensional, 25 item scale draws on five conceptual areas - personal competence, trust/ tolerance/ strengthening effects of stress, acceptance of change and secure relationships, control and spiritual influences and so captures the concepts of broadening and building theories (Fredrickson, 2001). In a recent review the CDRISC was recognised as one of the scales with the strongest psychometric properties (Windle *et al.* 2011). A subsequent factor analysis of the CDRISC found some redundant items which led to the development of the ten item a short form CDRISC scale (Campbell-Sills & Stein, 2007), a robust psychometrically sound resilience scale to measure stress coping ability in clinical and experimental situations. These resilience scales have been used to distinguish between persons with lesser or greater resilience, in order to compare their characteristics and response to events (e.g. Ong *et al.* 2006, Waugh et al 2008, Scali *et al.* 2012). Another aspect of resilience research has focused on investigating the ability to recover from stressors – to bounce back- , and in this case, levels of positive emotions, pre and post stressor, have been used as a measure of psychological resilience (e.g. Tugade & Fredrickson, 2004).

1.6.1 Determinants of Resilience

Resilience has been found to be related to personality dimensions, being negatively associated with neuroticism, and positively correlated with extraversion and conscientiousness (Campbell-Sills *et al.* 2006). Both the latter attributes have also been

associated with successful coping with stressful events (Penley *et al.* 2002; Tugade *et al.* 2004). Other factors that have been identified with resilient functioning are positive self-perceptions and good attachments (Masten, 2001). This supported earlier findings by Rutter (1985) that resilient individuals had clear goals, being action orientated, having high self-efficacy and self-esteem, and strong attachments. Additionally, resilient individuals have the ability to adapt to change by using coping strategies, drawn from previous experiences, and in particular having a sense of humour and engaging the help of others (Rutter, 1985). Block and Kremen (1996) conceptualised these protective factors as 'ego resilience' which reflected general resourcefulness, flexibility of functioning, and strength of character. Those with high ego resilience were found to be optimistic, open, positive, energetic, curious and good at problem solving (Block & Kremen, 1996). Hardiness and coping are also similar constructs that are related to resilience as it has been demonstrated that these concepts mediate the relationship between stress and emotional wellbeing resiliency (Baez, 2000-02). Kobash identified that hardy individuals had a greater sense of internal locus of control, a stronger sense of commitment to self, a sense of meaning and the ability to see stressful events as challenges (Kobash, 1979). Hardiness has also been shown to protect soldiers from developing post-traumatic stress disorder (PTSD) (Waysman *et al.* 2001).

However for the purpose of this thesis, it is important to distinguish between resilience and coping. Coping research is rooted within the ability of the individual to adapt to events generally and how coping responses are used to manage stressful encounters (Fletcher & Sarkar, 2013). Resilience has however a positive focus on adaptation, and counters the negative focus of 'coping' (Lemay, 2004). Whilst a coping response influences behaviour, which may be positive (self-talk) or negative (self-harm), resilience influences appraisal of the event and therefore choice of coping style, in a positive way, prior to the behaviour and thereby acting as a protective factor moderating the stress process (Fletcher & Sarkar, 2013). Additionally resilience is more than just recovery, and as well as positive adaptation also encompasses growth to maintain healthy and stable levels of physical and psychological functioning and to

avoid psychological dysfunction when faced with novel and challenging environments or coping with traumatic experiences (Bonanno, 2004).

Resilience is associated with many positive adaptations to adversity. For example resilient people experience less grief symptoms on bereavement (Bonanno *et al.* 2005) perceive less pain and stress (Friborg *et al.* 2006) and report fewer depressive symptoms following a national crisis (Fredrickson *et al.* 2003). Resilience has also been found to moderate the impact of self-reported childhood emotional neglect (Campbell-Sills *et al.* 2006). These researchers found that those with high emotional neglect and high resilience, as measured by a resilience questionnaire scale, had the lowest current psychiatric symptoms of the subjects' studies, lower even than those with low childhood neglect and high resilience. This lends support to the idea that resilience builds growth and not just recovery. This idea was first proposed in the 'broaden-and-build theory' (Fredrickson, 2001), which states that positive emotions, such as amusement and contentment, influence, alter and enrich neural processes and thereby widen the thought/action repertoire. Developing this further Tugade and Fredrickson (2004) suggested that this was due to positive emotions increasing the ability to find positive meaning in stressed circumstances which allow for 'broadening of one's mindset'. They found positive correlation between high resilience and the coping strategy of finding positive meaning, and that this relationship was mediated through positive emotion.

The role of positive emotions in resilience has also been noted in a cohort of research subjects (Fredrickson *et al.* 2003) being studied pre and post 9/11, and it was observed that the ability to spontaneously access positive emotions (i.e. gratitude, interest and love) mediated whether people thrived or became depressed. Fredrickson & Losada (2005) have postulated that there is a critical level of positive versus negative emotions which allows a person to flourish. Although the exact nature of this relationship has recently been questioned, the evidence still suggests that there is a non-linear relationship between flourishing and positive emotions (Fredrickson, 2013) Philippe *et al.* (2009) similarly looked at resilience as a function of memory networks, and showed that resilient participants had more positive memory networks in response to

a sad film (death of parents in a car crash) than less resilient participants. Interestingly a positive memory network was positively associated ($r = 0.21$) with memories that were thematically unrelated to the film (i.e. a memory of a visit to the dentist), suggesting that for a beneficial effect on resilience the relevance of the memories may not be as important as their ability to generate enough positive emotions.

Whether someone is emotionally resilient also affects physiological functioning as well their psychological functioning. In a series of experiments Tugade and Fredrickson (2004) demonstrated that physiological response, as measured by cardiovascular reactivity, to a stressor of having to prepare for giving a public speech, was the same in both high and low resilient participants, but during physiological recovery from this threat (i.e. when the task of preparing for a speech was removed), the high resilient participants' cardiovascular reactivity recovered more quickly than the low resilient participants. When the experiment was manipulated so that the instructions for a speech were seen as a challenge (rather than a threat) there was no difference in cardiac recovery between the high and low resilient participants. The authors suggested that positive emotions were responsible for the difference in physiological recovery and that cognitive appraisal of the task being presented as a challenge (rather than a threat), brings with it positive emotions which increase coping. However these studies were carried out in a laboratory situation and so the findings may not generalise to real life situations. Additionally effects were measured immediately, and therefore the duration of any beneficial effect is unknown.

Other researchers have supported the hypothesis that positive emotions build physical health (for a review see Howell *et al.* 2007). More recently Kok *et al.* (2013) demonstrated that an intervention, loving kindness meditation, designed to increase positive emotions was moderated by an increase in vagal tone, a proxy measure for physical health. They also found that there was an upward spiral of wellbeing, as physical health was found to increase vagal tone, mediated by increased perceptions of social connections (Kok *et al.* 2013)

The theory that exposure to moderate levels of stress results in physiological and psychological toughening, gives the idea that resilience can be through of as 'stress inoculation' (Rutter, 1999).

It has been proposed that emotional flexibility is key to being resilient and helps successful adaptation to stress (Waugh, Wager *et al.* 2008). This allows for physiological resources when needed (e.g. increased cardiac reactivity when facing the threat), and conservation of resources when no longer needed (i.e. rapid recovery when the threat is over). This idea is based on observation in experimental studies that the less resilient participants were less successful at conserving their resources, as demonstrated in slower recovery from a stressor. This type of conservation of resources has been demonstrated in unpredictable conditions as well (Waugh, Fredrickson *et al.* 2008), where high resilient participants had faster emotional and physiological recovery to *anticipated* negative events that did *not* occur, compared to low resilient participants (Waugh, Fredrickson *et al.* 2008).

1.6.2 Modifying resilience

Research also suggests that an individual's resilience can change and low resilient people can be made more resilient. As described above, Tugade *et al.* (2004) found that positive appraisal of a threat situation allowed low resilient participants to respond in a similar manner to high resilient participants. Although the generalizability of this study is limited as it used healthy students in a laboratory setting, other studies have used clinical participants and have demonstrated that resilience per se, as measured by a self-reported scale, can change pre and post therapy. For example, Connor & Davidson (2003) demonstrated with the CDRISC that participants with generalised anxiety disorder or PTSD had significantly increased levels of resilience following pharmacotherapy and pharmacotherapy plus cognitive behavioural therapy (Connor, 2006).

Although there have been few studies on interventions to increase resilience, a recent meta-analysis of 33 studies on resilience provides empirical evidence for those

protective psychological factors which had the greatest associations with resilience (Lee *et al.* 2013). This study compared the effect sizes of demographic variable (age and gender), risk variables (anxiety, depression, negative affect, perceived stress and PTSD) and psychological protective factors (life satisfaction, optimism, positive affect, self-efficacy, self-esteem and social support) on resilience levels. Results showed that whilst all these factors were significantly associated with resilience, psychological protective factors were most strongly related to resilience levels and demographic factors the least. Of the psychological factors, self-efficacy had the strongest effect ($n=1317, r=.61, p<.001$), followed by positive affect ($n=2231, r=.59, p<.001$) and self-esteem ($n=3916, r=.55, p<.001$). The other protective factors were similarly more strongly correlated with resilience than the risk factors. Of the risk factors depression and anxiety were the highest ($n=5022, r=-.39, p<.001$) and ($n=2866, r=-.38, p<.001$), respectively. These associations are correlations and therefore causal inference cannot be determined. Longitudinal studies would need to be carried out to investigate this. These results are also limited by the participants of the included studies, who were mainly white Americans, and further research is needed to identify if the same psychological factors are protective in different cultural backgrounds. However within these limitations, these results suggest that interventions which focus on psychological factors, particularly self-efficacy, self-esteem and positive affect, will strengthen resilience. Given that the workplace has been identified as a suitable place for health promotion, there will now follow a critical review of mental health interventions and their approaches in the workplace.

1.7 Mental Health Interventions in the Workplace

1.7.1 Overview

Health promotion at work can be primary (protect and prevention), secondary (rehabilitation) or tertiary (management of chronic conditions) focused. Interventions can be workplace focused, which address the working environment such as hours of work, organisational management style, workload, work control and autonomy, or

worker focused (individual) addressing individual stress. Mental health promotion at work most commonly takes an individual focus. Individually focused workplace interventions have three approaches – 1. change the way employees appraise stressors, 2. mitigate these stressors or 3. build employee coping capacity for stressors (Hill *et al.*, 2007) although arguably 1 may overlap with 3. Individual interventions are usually based round stress management techniques. There are many different types but they tend to be either based on CBT, training in relaxation techniques, or a combination of both (commonly referred to as 'multimodal'). Additionally these interventions can be self-directed (or self-help) or face to face.

Although these interventions fall under the category of stress management interventions, as often their main outcome measures are stress, anxiety and/or depression, many interventions are increasingly recognising and encompassing positive health outcome measures and adopting a 'positive mental health' perspective, rather than an 'ill-health' focus (Hill et al 2007). This is in keeping with a primary health promotion approach to prevent the onset of stress, anxiety or depression and to promote wellbeing (Ewles & Simnet, 1992). Positive Mental Training is therefore a health promotion intervention as it adopts a positive health perspective to aid recovery from stress and mental dysfunction, building wellbeing and resilience.

Although ideally health promotion at work should encompass both organisational and individual participation, there is some debate in the literature as to the effectiveness of organisationally focussed health interventions. The British Occupational Health Research Fund (Seymour & Grove, 2005) review of workplace interventions for common mental health problems found individual interventions to be more effective than organisational approaches, whereas a Cochrane Review, in 2009, '*Preventing occupational stress in healthcare workers'* (Marine *et al*. 2006) which identified 19 studies with a primary outcome measure of stress or burnout, reported, in contrast to Seymour & Grove (2005), limited evidence for organisation–focused interventions and individual focused interventions.. However there were only three studies in the organisational category and one of these employed an intervention consisting of

support and advice by managers, which could be considered an individually focused intervention. Numbers of organisational studies are far fewer, perhaps due to the challenges of researching this, e.g. long-time scales, and therefore their efficacy is harder to assess.

However the British Occupational Health Research Fund suggested that more attention should be paid to developing and evaluating a range of prevention strategies, rather than just Cognitive Behavioural Therapy (CBT), and to have interventions that match the particular needs of the individual employee (Seymour & Grove, 2005).

This current author's research responds to this call by evaluating a person directed mental health promotion intervention in the workplace.

There will now follow a consideration of individually focused workplace mental health interventions which will set the context of this present study's intervention. This will firstly provide an overview with reference to meta-analyses and then focus on the main approaches within this field, i.e. relaxation, CBT, mindfulness and resilience.

1.7.2 Individually Focused Workplace Mental Health Interventions

Research into mental health interventions in the workplace is very diverse. Not only are there different approaches, as mentioned above, of organisational or self-help, but there are also many different types and sizes of workplaces, different types of interventions, aims and outcome measures. Accordingly reviews in this area often have differing areas of focus in order to attempt some generalizability between studies. Some adopt an occupational group focus, whilst others focus on intervention type and some attempt both. Each has its merits and limitations.

A recent review of workplace mental health promotion interventions highlighted the diversity of research and interventions in this field, as they reported that a meta-analysis was not possible due to the heterogeneity of the populations targeted, outcome variables and measures used (Czabala *et al.* 2011). These researchers appraised studies that addressed any mental health outcome, such as rest break schedules, recreational music-making and reduction in absenteeism, and not just stress reduction Criteria for

inclusion was having a control group and although most studies were RCTs, the controls were usually wait-list or no treatment. Of the 79 studies included only 12 studies compared two experimental groups. The most frequent intervention aim was stress reduction and better coping. Most interventions had been used in only one study, so reliability was untested, but analysis of content showed that cognitive and cognitive-behavioural theories provided the main rationale. The authors surmised that there was no conclusive evidence of effectiveness of the interventions reviewed. Czabala and colleagues report a relevant summary of workplace mental health promotion interventions, however this research could have had greater utility if it taken a narrow subsection of these studies and conducted a meta-analysis.

Adopting such an approach a Cochrane meta-analysis (Marine *et al.* 2006) focused only on interventions for stress prevention in healthcare workers. This review included 14 studies, grouped into person centred (n=9) or organisation centred (n=5), and found evidence that individually focused interventions can reduce stress, burnout, and anxiety. Three studies showed stress remained low one month after the intervention and another found that burnout remained lower up to two years later, when the intervention was boosted. This review included different types of person directed interventions, such as CBT as well as music making, but did not compare the effectiveness of these. As this meta-analysis was confined to a single professional group, their results may not be applicable to other professional groups.

Other researchers have carried out meta-analyses and also compared different intervention types. For example In a meta-analysis of interventions for work related stress, van der Klink *et al.* (2001) found individually focused interventions to be significantly effective (Cohen's d = 0.44, 95% CI= 0.36, 0.52), [in contrast to organisational interventions which did not show a significant effect size (Cohen's d = .08, 95% CI =-0.03, 0.19)] Analysis of the different types of individually focused interventions revealed that CBT focused programmes had the largest effect size (Cohen's d = 0.68, 95% CI= 0.54, 0.82), although heterogeneous effects indicated a

range of levels of effectiveness, perhaps this may reflect the diversity of outcome measures, or that some participants were screened on stress levels for entry into the study. Relaxation programmes showed small to moderate effects (Cohen's $d = 0.35$, 95% CI= 0.0.22, 0.48) and multi-modal interventions moderate effects (Cohen's $d = 0.51$, 95% CI= 0.33, 0.69). Although CBT approaches were found to be significantly more effective than relaxation programmes ($p<.005$), differences between CBT and multimodal, and multimodal and relaxation, were not significant. Outcome indicator analysis indicated that different types of interventions had different effects. The multimodal approaches and relaxation, were not successful at increasing psychological resources (e.g. coping), whereas the CBT interventions were, and the multimodal interventions were more effective at reducing physiological complaints and anxiety and depressive symptoms.

There are within the workplace health promotion stress management literature many different interventions that combine different techniques, and these are often referred to as mind/body interventions. Examples of these are Mindfulness Based Stress Reduction (MBSR), Mindfulness Based Cognitive Therapy (MBCT), Acceptance and Commitment Therapy (ACT) and Resilience Programmes. All these interventions are combinations of elements of relaxation, mindfulness and cognitive and behavioural techniques (commonly delivered as CBT). Prior to critically reviewing these interventions, and to aid understanding of their mechanisms of change, a brief description of these core techniques will firstly be presented.

1.7.2.1 Relaxation

Relaxation is defined as understood here in this present study as '*the state of being free from tension and anxiety'* (Oxford English Dictionary, 2013). There is a large literature on relaxation and its effects.

Relaxation training has been shown to result in many beneficial physical changes, particularly those related to a reduction in the stress response (Park *et al.* 2013), e.g. reduced sympathetic activation as evidenced by lower rates of oxygen consumption,

decreased respiratory rate, heart rate and blood lactate (Benson, 1975), reduced blood pressure sustained over time (Patel, 1985), in those on antihypertensive medication, (Benson *et al.* 1974), lower cholesterol levels (Patel, 1985) effect an improvement in IBS symptoms (Van der Veek *et al.* 2007) and significantly increase Immunoglobulin A levels (Lowe *et al.* 2001).

Additionally, relaxation training has also been shown to have beneficial psychological effects in a wide variety of medical and psychological conditions. For example significantly decreased symptoms of anxiety and depression, and increased quality of life indicators and psychological health have been demonstrated in, for example, patients with endometriosis undergoing treatment (Zhao *et al.* 2012); anxious heart patients (Dehdari *et al.* 2009); obstetric pain (De Paula, *et al.* 2002), nausea and vomiting in chemotherapy patients (Molassiotis, 2000), perceived stress in pregnant women (Bastani *et al.* 2005).

There are many different types of relaxation training which can include physical (somatic) and/or mental (cognitive) relaxation: physical relaxation focusing on releasing muscular tension and mental relaxation focusing on attentional aspects as well as the breath (Benson, 1975; Patel, 1989). One of the first documented relaxation training methods was Autogenic Training (AT), developed by Dr Schultz in the 1920s. This relaxation method incorporates sequential muscular relaxation through internally vocalised phrases, breath awareness and emotional awareness. Another well documented and widely adapted form of physical relaxation is Progressive Muscular Relaxation (PMR) training. This is a technique that was pioneered by Jacobson (Jacobson, 1938) and teaches through sequential tensing and releasing of muscles in the body how to relax the body. In its pure form there is no focus on the breath. Some researchers have adapted these traditional methods, such as applied relaxation (AR) (Ost, 1987), which is a relaxation technique which builds upon progressive muscular relaxation by following this after 4 days of PMR practice with release only relaxation (relaxation of muscles with no tensing of muscles first) and after 1 – 2 weeks developing a conditioned relaxation response, focusing on relaxing with the breath. Or

similarly, somatic training (ST) incorporates aspects of AT and AR but also incorporating visualisation (Jain *et al.* 2007).

Another difference between relaxation methods is whether or not bodily relaxation is intentionally induced, either through muscular effort as in PMR, or through visualisation (imagery) techniques as in AT, hypnosis (through suggestion) or activities such as yoga. Meditation and mindfulness are relaxation techniques that do not intentionally focus on relaxing the body, but use a different approach of focusing on moment to moment awareness, acceptance of the physical state and attention training. Mindfulness practice comes from Buddhist meditation and brings with it the action of observation with acceptance, without trying to change (Kabat-Zinn *et al.* 1992).

Fredrickson *et al.* (2008) found loving kindness meditation in the workplace gave rise to positive outcomes. This study recruited volunteer employees into seven weekly meditation sessions, results showed the meditation resulted in positive emotions, and these, in turn, were found to produce increases in mindfulness, purpose in life, social support, and decreases in illness symptoms. These results then support Fredrickson's broaden and build theory in that personal resource benefits led to increased life satisfaction and reduced depressive symptoms. There were however a number of limitations to this study. It was a short study period (7 weeks), and although randomised, the control group was only a wait list control, a methodological limitation. Additionally, the participants were briefed on the benefits of meditation prior to commencing the research, which may be a source of bias. Notwithstanding these the results suggest that meditation for those interested in it, could be a successful way to increase wellbeing.

However Dr Benson (Benson, 1975; Park *et al.* 2013) described a generic response to relaxation training which through the release of body tension resulted in a decreased psychophysiological state, which he conceptualised as the 'relaxation response', and a corollary to the stress response. This author documented many differing relaxation techniques that elicit this relaxation response, including breath awareness, self-

hypnosis, guided imagery, autogenic training, yoga, mindful awareness, transcendental meditation, progressive muscle relaxation. He theorised that the function of eliciting the relaxation response is resiliency: decreasing stress reactivity and increasing connectedness to self and others. These approaches are embraced within mind-body medicine, a concept that accepts the monistic nature of the body and mind (Barrows & Jacobs, 2002).

It may be that different types of relaxation have some specific effects (Jain *et al.* 2007). These researchers conducted a RCT comparing mindfulness meditations (MM) to somatic relaxation training and found there was no significant difference effect, in reduction of distress and increase in positive mood states, compared with control (interesting to note here that their MM included yoga, a somatic component) (Jain *et al.* 2007), but found a significant decrease in distractive and ruminative thoughts and behaviours in the meditation compared with the control. They suggest that reducing rumination is a partial mediator for the reduction in distress observed by mindfulness practice (Jain *et al.* 2007) a results supported by the observation that at meditators have reduced negative cognitive distortions (Sears & Kraus, 2009).

Another researcher (Kaspereen, 2012) combined these two different types of relaxation, i.e. meditation with relaxation therapy. This researcher found that four weekly sessions significantly increased SWB and reduced perceived stress in school teachers. However different methodology made comparison with Jain *et. al* (2007) as study not possible, nor did they look to see if there was any additive effect of combining the two techniques.

1.7.2.2 Cognitive Behavioural Therapy (CBT)

CBT is perhaps the most widely used mental health intervention in the UK. Longmore and Worrell (2007) conducted a review of component studies of CBT and concluded, in agreement with other researchers (Hayes, 2004) that the cognitive aspect of CBT did not specifically increase the effectiveness of the therapy. There was no difference

between cognitive interventions and behavioural interventions, nor any added value from cognitive elements being included. CBT as its name suggests combines 2 broad schools of techniques: 1) Cognitive therapy; based on the assumption that mood is a result of dysfunctional thoughts and that by detecting and undoing these dysfunctional thinking habits, a more realistic and functional way of thinking, will result and so mood will improve. Cognitive therapy, automatic thoughts and 'rational emotional behavior therapy' are examples of other therapies included in this group. 2) Behavioural therapy; based on classical and operant conditioning theory and encompasses imaginal therapy, gradual (or graded) exposure, exposure response prevention; self-control desensitisation, stimulus control approaches and self-instructional training. These components may be included to varying degrees in any CBT intervention which tend to be a pragmatic combination of concepts and techniques (Longmore & Worrell, 2007).

Whilst Longmore and Worrell (2007) acknowledge that component analysis may be flawed as this method would lose a possible combination effect of CBT, they postulate that the effective element of CBT is through creating a change in state or mode. Teasdale *et al.* (2002, p. 285) had previously described this as an increase in 'meta-cognitive awareness'; which is '*a cognitive set in which negative thoughts and feelings are seen as passing events in the mind rather than as inherent aspects of self or as necessarily valid reflections of reality'*. These researchers suggested that the ability to promote distance from negative thoughts rather than logically challenging erroneous beliefs as previously believed, was the mechanism by which CBT helps depression. This concept is also described as 'decentering' '*defined as the ability to observe one's thoughts and feelings as temporary, objective events in the mind'* (Fresco *et al.* 2007, p. 234). Although, not designed to be the same as mindfulness, this concept is very similar to mindfulness. Bishop suggests that there is a '*general domain of constructs that describe the ability to observe the temporal stream of thoughts and feelings'* and this would include mindfulness, experiential thinking and lower level construal (Bishop *et al.*, 2004, p. 235).

1.7.2.3 Mindfulness

Mindfulness is a concept that originates from Buddhism and relates to 'vipassana' (insight) mediation that encourages adoption of non-judgemental awareness of the present moment both in formal mediation and throughout the day (Nhat Hanh, 2001). The practice of mindfulness mediation is believed to bring greater insight to oneself and the environment, and through attending to that which is noticed, without criticism or judgement, it is possible observe, reflect, understand and integrate, rather than react to, thoughts and feelings. Inherent in this stance is acceptance of the current state of being, without intention to change it, e.g. noticing tensions and relaxations, not trying to relax. It is proposed that in this way greater psychological wellbeing can be achieved (Nhat Hanh, 2001).

Roger (1993) identified detachment as an aspect of successful coping. He described detachment as '*the feeling of being independent of the event and the emotion associated with it',* (p. 623). Detachment is also a concept embedded with mindfulness. Within the academic literature mindfulness has been described as '*detachment from thoughts while observing them objectively'* (Wells & Matthews, 1994) and '*the ability to stand back and see thoughts as passing events'* (Moore *et al.* 1996). Wells and Matthew (1994) related the ability to be mindful as an important way to reduce worry through meta-cognitive awareness, i.e. awareness of the worrying about worry. Consolidating ideas on mindfulness Bishop and colleagues (2004), reported a consensus statement defining mindfulness encompassing two facets; a) the capacity to remain in the present moment through sustained attention and b) acceptance and curiosity of one's feelings, thoughts and sensations.

These ideas have led to therapeutic interventions such as Mindfulness Based Cognitive Therapy (Segal *et al.* 2002), attention training (Wells, 1990) and Mindfulness Based Stress Reduction (Kabat-Zinn, 1990).

1.7.3 Mind/Body or Multimodal interventions

Multimodal interventions by their definition do combine different techniques and as this usually is a synthesis of cognitive and somatic exercises, these interventions can also be termed mind/body interventions. Mind body interventions have become much more prevalent in the workplace over last few years, mirroring their increase elsewhere and there is evidence that they are successful which will be reviewed here

1.7.3.1 Mindfulness Based Interventions

Mindfulness Based Stress Reduction and Mindfulness Based Cognitive Therapy are the two most commonly used mindfulness based interventions.

Mindfulness Based Stress Reduction (MBSR) (Kabat-Zinn, 1990) was developed by Jon Kabat-Zinn from stress reduction relaxation programmes for use in a clinical setting to help patients cope with or recover from pain and stress. MBSR is a standardised programme that teaches mindfulness practice in groups over the course of 2 – 2 ½ hour weekly sessions over eight to ten weeks. Sessions include discussing stress and coping, the use of yoga postures to bring awareness to the body, body scan techniques and breath awareness. An all-day intensive practice is held in the 6th week. Participants are encouraged to use these techniques in their everyday lives. Smith (2004) has proposed that MBSR be viewed as a combination approach, as the programme incorporates many exercises in addition to mindfulness meditation.

In a review of MBSR studies (Baer, 2003), many studies were identified that did not have a control group, but those that did found that MBSR was more effective than control (waiting list control or treatment as usual) in patients with psoriasis, cancer, students and stressed community volunteers. More recently other researchers have reported similarly positive results, e.g. in a RCT using MBSR to help health care professionals manage their stress found that MBSR significantly increased self-compassion, and reduced perceived stress compared to a wait list control. Satisfaction with life, burnout scale and brief symptom inventory measures showed a trend toward greater positive changes, although these did not reach significance (Shapiro *et al.*

2005). Of note is that nearly 50% of participants dropped out, with participants commenting this was due to lack of time. The intervention consisted of eight weekly two hour sessions.

A recent RCT compared MBSR with therapeutic yoga, which included breathing retraining and guided visualisation, and a control group who received a list of resources. The researchers found both the mind body programmes delivered significantly better outcomes in perceived stress, sleep and heart rate variability than the control, but that there was no significant difference between the mind body interventions in these outcome measures. Interestingly this study also compared method of delivery of the intervention, online or in person. No significant difference was found between these two delivery methods although the online group showed less attrition, indicating better engagement (Wolever *et al.* 2012).

Mindfulness Based Cognitive Therapy (MBCT) was developed by Segal, Williams and Teasdale (2002) and is also a manualised programme of 2 hour weekly sessions, delivered in a group setting, over the course of 8 weeks. It is largely based on MBSR, but also incorporates aspects of cognitive therapy in that it seeks, through attention training, to make participants more aware of their cognitions and therefore to be able to disengage from their automatic dysfunctional cognitive patterns (Segal *et al.* 2002). MBCT was specifically designed to treat previously depressed patients to avoid relapse. Results from this group of researchers' studies identified that MBCT did indeed prevent relapse in those who had 3 or more previous depressive episodes but for those with 2 or less previous depressive episodes no benefit was observed over treatment as usual (Ma & Teasdale, 2004; Teasdale *et al.* 2000).

A recent review of RCTs of mindfulness based stress reduction and mindfulness based cognitive therapy (Fjorback *et al.* 2011) included 21 studies and found limited evidence of efficacy, as for those studies with an active control the MBCT or the MBSR showed no significant advantage over active control [most studies were wait list control or treatment as usual]. Results showed that overall there was a medium effect size, and interestingly found a differential effect between these two

interventions. MBSR was most effective at improving mental health and MBCT was most effective at reducing relapse.

1.7.3.2 Acceptance and Commitment Therapy ACT

Acceptance and Commitment Therapy (ACT) similarly employs mindfulness techniques but also encompasses the role of acceptance (Hayes, 2004). The core of this therapy is to increase psychological flexibility through six internal processes, i.e. acceptance, defusion, self as context, contact with the present moment, values, and committed action. This therapy is usually delivered in three, three hour sessions over four weeks. ACT has been found to be an effective workplace stress intervention, with results indicating that it is more effective at improving work-related and mental health outcomes than a waitlist control (Bond & Bunce, 2000). However, when compared to another intervention (a stressor modification, innovation promotion programme, IPP), results showed both ACT and IPP similarly improved most work and mental health outcomes, with ACT being superior only in the BDI scale. This result concurs with a more recent meta-analysis of 18 ACT RCT studies, which concluded that ACT was more effective than control (waitlist, treatment as usual or psychological placebo) in a number of areas, such as pain, smoking cessation, depression, anxiety and workplace stress but there was as yet no evidence that this therapy was more effective than other established treatments therapies (Powers *et al.* 2009). This finding is similar to other researchers, cited earlier, e.g. Mayo-Wilson and Montgomery (2013), Elkin *et al.*, (1989), who have also shown equivalent intervention treatment efficacy. A strength of the Bond and Bunce (2000) study, was, as with many other ACT researchers (e.g. see Ruiz, 2012), that they sought to investigate the underlying mechanisms of change through mediation analysis, and reported that acceptance mediated the changes in the ACT group, whereas stressor modification mediated changes in the IPP group, suggesting that there may be benefit in offering differing interventions concurrently, as in multi-modal interventions. Another more recent workplace study also investigated mediators of ACT outcomes and reported that psychological flexibility mediated a decrease in emotional exhaustion in the ACT group (Lloyd *et al.* 2013).

1.7.3.3 Resilience programmes

Another emerging area within workplace interventions is in resilience programmes. This type of programme addresses the identified need to consider employees' attitudes and beliefs, rather than only skills training. This field is at an early stage and only a few studies have been published in this area.

One such study is a resilience building programme that has been subject to a feasibility study in the workplace (Burton *et al.* 2010). The intervention investigated was based on Acceptance and Commitment Therapy (ACT), though adapted to focus on resilience, positive emotions, life meaning, social support and active coping (as well as more traditional elements of ACT). The intervention was delivered through 11, two-hour modules, incorporating education, experiential exercises and a workbook. Attrition analysis showed 44% missed 3 or more sessions, due to time conflicts or breaks. The study indicated good feasibility although each participant had 22 contact hours, and numbers were small, with only 16 completers. Pre and post results were positive in the variety of mainly positive indicators, such as positive affect, acceptance, mindfulness, and in stress, measured with DASS. Other indicators including anxiety and depression (measured with DASS) were not significantly different over the study period. This study was a feasibility study and did not have a control group and therefore conclusions are limited.

Another similar resilience building study has been carried out by Millear *et al.* (2008). This study was a pilot trial of a wellbeing and resilience programme conducted within a resource sector company. This study was comparing an intervention of 11, one hour, weekly group sessions with a no treatment control, recruited via the internet. Lack of a workplace matched control limits the confidence of conclusions drawn from this study and results have to be interpreted in this light. The number of participants was small, 28 entered the study, 9 completed at a year. However analysis showed significantly lower post-test levels in stress, increased self-efficacy and greater work-life fit compared to the control condition at 9 months follow up. The effect size for stress reduction increasing from Cohen's $d = .46$ to $d = .96$ ($p < .05$ for both times) from

three to nine months. Depression was not significantly different between groups across time but showed a significant within group decrease at three months, and approached this at nine months.

1.7.4 Non-specific Intervention Effects

Common to all interventions are non-specific effects. These are highlighted in results which show an overall intervention effect but no difference between interventions or active control.   For example Fjorback *et al.* (2011)'s review found that those studies with an active control reported no significant difference between intervention and control. Similarly in a study comparing two mind body interventions and control, no significant difference was found between the intervention conditions (Wolever *et al.* 2012) Analysis of a large multi-centre RCT of treatment for depression, comparing two psychological interventions, anti-depressants and placebo, all delivered with clinical support, points to the mechanisms of non-specific intervention effects. This analysis showed no difference of recovery between these groups and that patients' expectation of the outcome, and interpersonal relationship with therapist/clinician were the only predictors of recovery (Sotsky *et al.* 1991).

Positive expectation is thought to generate non-specific placebo effects (Kirsch, 1999). It has been proposed that this relationship is mediated by effort, with effort having its effect through positive mood generated from engaging in the activity (Gaitan-Sierra & Hyland, 2011). Other researchers, have identified that non clinical, health promotion behaviours also have nonspecific or placebo mediated benefits. For example, positive expectations of health outcomes have been found to influence mood and physical symptoms, on exposure to a wind farm (Crichton *et al.* 2013), and reduced body mass index and blood pressure in chambermaids (Crum & Langer, 2007)

The similarity of intervention effect and the role of expectancy highlight the homogeneity of interventions, the need for more diverse interventions and also the importance of looking at the underlying mechanisms for treatment rather than to compare treatments, head to head (Blatt *et al.*1996).

1.7.4.1 Summary

In summary, research in the area of mental health promotion in the workplace indicates several things. Firstly, that individual techniques, such as relaxation, mindfulness and CBT are effective health promotion stress management interventions. Additionally research shows that in combination these techniques can create successful intervention programmes. Furthermore studies in this area point to differential effects of different techniques. For example it may be that different types of relaxation have some specific effects (Jain *et al.* 2007). Interestingly it may be that combining different techniques may be additive, as other research, not in stress management but in pain, suggests that expectancy and attentional redirection have an additive effect, and therefore when used together maximise pain relief (Buhle *et al*. 2012).

There is however a need for more robust studies which have an active control (Marine *et al*. 2006). It is commonplace for studies which report intervention effects to have a waitlist or no treatment control. However studies which include an active control do not show such effects as reported in a review by Fjorback *et al.* (2011) comparing active control with MBCR and MBCT.

In addition results from researchers who have compared methods of intervention delivery indicate that for some types of intervention, self-management (i.e. self-help) may be as effective as face to face delivery and is may be more cost effective and attractive to employees (e.g. Wolever *et. al.* 2012, comparing internet or face to face mindfulness).

In conclusion it may well be advantageous to explore the benefit of a brief, self-directed, mind/body resilience based intervention to be delivered in the workplace, which should be well evaluated against an active control. The intervention under investigation in this current author's thesis Positive Mental Training, fits this remit.

Before continuing with a description of Positive Mental Training, there follows a short section on self-help, as PMT is a self-help intervention.

1.7.5 Self-help Interventions

Self-help is the term used for a therapeutic intervention which has been designed to be used with minimal or no help from a professional. Self-help interventions can be delivered through a variety of media, such as books, audio or video material, computer, support group or a self-directed activity such as therapeutic writing (Bower *et al.* 2001). Guided self-help is the term used when self-help material is used in conjunction with professional support (usual minimal) (Cuijpers, 2010).

Self–help has a number of benefits compared with face to face therapy (Papworth, 2006). These comprise of; being immediately available in many different forms, i.e. books, internet, library; being are able to reach a greater proportion of the population; able to reach hard to access groups, i.e. those that do not want to or find it difficult to access the more standard traditional services; able to reach people at an earlier stage of disease progression and could be preventive; enabling empowerment by giving the responsibility and skills for treatment to the individual; causing less stigma as they can be carried out in private, avoiding public labelling; being flexible; being able to be shared with family and friends; and being more cost effective. There are of course disadvantages to self-help, most obviously is that it is self-directed, and may require more motivation to carry out. There is also no encouragement, learnings or sharing between group members or facilitators.

Despite the advantages of self-help, this method of delivery is seldom used for health promotion interventions in the workplace. For example a Cochrane review of occupational stress in healthcare workers, identified 19 studies for inclusion, and none used self-help interventions. It is also worth noting that the methodological rigour of the studies was poor. Although they were mainly (n=14) RCT's, the other studies were cluster – randomised trials and two cross over studies, most of these (n=15) used a 'no intervention' or 'wait list' as a control (Marine *et al.* 2009). More recent screening of the literature has identified a few self-help interventions in the workplace, particularly via the internet, for example, (Schneider *et al.* 2012, computerised CBT; Hasson *et al.*

2010, multimodal intervention and Wolever *et al.* 2012, internet yoga) although this was not a systematic review.

There are no reviews of mental health self-help interventions in the workplace. However a recent Cochrane review of self-help interventions for anxiety, the majority of which also included depression measures, has recently been conducted (Mayo-Wilson & Montgomery 2013). This meta-analysis reported that self-help interventions were overall more effective at treating, self-rated anxiety and depression, than no treatment control, (including treatment as usual) showing a medium effect size (although heterogeneity was substantial indicating a variation in effect). Relatively few studies carried out follow up within six months (n =13) and analysis showed the effect size lessened. Fewer studies still had follow up over six months (five) and for these, no significant effect was found. However a limitation of much of this research is the comparison group, 81 out of 111 studies had a no treatment control. There was a small effect of the benefit of face to face therapy compared to self-help for anxiety, but for depression and quality of life indicators there was no significant difference between face to face or self-help therapy. Additionally the interventions were diverse, and some included therapists' time, making comparison difficult. 70 studies were CBT (manual or computer or both) studies, 19 exposure only, 2 desensitisation alone, 6 muscle relaxation, 3 applied relaxation and 1 problem solving. All but nine of these interventions used text, either in the form of a book or written web page on the internet. No significant difference between interventions was found, although the effect of relaxation was non-significant. The authors commented on the small number of people who responded to media delivered interventions, indicating that perhaps this type of self-help is not very popular.

1.8 Positive Mental Training

Positive Mental Training programme, a novel health intervention programme, was the focus of the studies presented here in this current thesis. This section will describe the Positive Mental Training programme (PMT), firstly with a brief description of its

origins, design and development, followed by a critical review of the existing research into the programme, then a description of the components of this multi component intervention and finally a consideration of mechanisms by which PMT could have an effect.

1.8.1 Origins of Positive Mental Training

Positive Mental Training originates from the concept of 'Integrated Mental Training' a programme devised by Swedish psychologist Lars Eric Uneståhl in the 1970's, which incorporates many of his understandings from his academic work on hypnosis and self-hypnosis in Uppsala University, Sweden. 'Integrated Mental Training' is a systematic long term training of mental processes (thoughts, images, attitudes and emotions) initially developed to help individuals achieve peak performance in sport (Uneståhl, 1996). Uneståhl identified four mental dimensions relevant to the ideal performance state: self-image, emotion (the right feeling), attitude and goal (image). His programme has been used by national and Olympic teams in the 1970s, and introduced into schools, education and business areas since the 1980s.

1.8.2 Positive Mental Training Design Process

Positive Mental Training was first developed by Dr Alastair Dobbin, a General Practitioner and Sheila Ross (the current author) a health promotion specialist, in 2004. Dr Dobbin, also a clinical hypnotist, had already conducted a study into the use of self-hypnosis in a primary care setting (Dobbin *et al*. 2004) and recognised the synergy between the Integrated Mental Training programme and psychotherapeutic techniques used in hypnotherapy for the treatment of common mental health disorders. Responding to a request from the Scottish Government Chief Medical Officer, Dr Dobbin developed the programme into a clinical resource for the treatment of depression, with the help of Ms Ross who recognised the benefit and utility of positive framed self-help materials for the promotion of health. Adopting the listening pattern of Integrated Mental Training of one track per week, 12 tracks were chosen as 12

weeks is often utilised as an intervention design in studies of psychological therapies (e.g. Ward *et al.* 2000; Mynors-Wallis *et al.,* 1995). The order of the tracks for the first four tracks also follows the original Integrated Mental Training. This order was considered important as it builds sequentially a deep state of attentional focus and physical relaxation (see 1.7.2.1). The order of the subsequent tracks was determined by popularity (patient feedback) and personal choice of tracks thought to be most therapeutically beneficial. Although the tracks originate from the original Swedish versions, modifications were made for cultural specificity and for therapeutic alignment. The design of each track follows the design of hypnotic interventions, i.e. starting with relaxation and followed by positive suggestion, attentional fixation and visualisation. PMT starts with muscular relaxation for two weeks followed by guided visualisation of a safe place for two weeks. This process of firstly inducing body calm, i.e. increased parasympathetic activity and decreased sympathetic activity, through muscle relaxation, breathing regulation and attention training, also facilitates an experiential mindset similar to that induced with meditation or hypnosis. This then is thought to facilitate the absorption of positive suggestion and the retrieval of positive memories (discussed below within the attentional manipulation focus, section1.8.5.3).

A short video was also added to the audio programme to provide a cognitive framework and explanation for the programme. This idea was influenced by research which demonstrated that a brief pseudo-educational video resulted in reduced pain and medical utilisation in whiplash patients (Oliveira *et al*. 2005). The programme design was validated by research as an effective tool for aiding recovery from depression (see 1.8.3).

Following research, detailed below, the programme was approved by stepped care levels 1 and 2 for use as guided self-help for depression in Edinburgh and is now used within primary care in the NHS in Edinburgh and other areas of the UK. A core aspect of the use of the programme in this setting is training in mental health, dysfunction and recovery, to enable health care professionals to understand the programme and therefore be able to 'guide' patients' use of the programme. Development, research and evaluation continue.

1.8.3 Research

A number of studies investigating the efficacy of Positive Mental Training for use as a treatment for recovery from emotional dysfunction have been conducted. A study into the efficacy of the programme was conducted with Edinburgh University (Dobbin *et al.* 2009). This study was a Partially Randomised Preference Trial (PRP), a study design which asks patients to agree to randomisation but offers the choice of therapy if they are unwilling for randomisation. Patients visiting their GPs (with a new episode of depression) thus had a choice of treatment options, Positive Mental Training or anti-depressant therapy, or to be randomised to either. 93% (*n*=50) of participants chose the self-help treatment, with only 4 choosing anti-depressants and 4 choosing to be randomised. Therefore the randomised groups were too small for comparison. As the anti-depressant group only had 4 participants, analysis centred on pre and post treatment of the Positive Mental Training group. Results were that those in this group showed a significant reduction in depression, and improvements in general health and vitality (as measured by the short form quality of life questionnaire (SF36)) over a period of 12 weeks. Acknowledging the lack of an adequate comparison group, results were benchmarked against similar psychotherapy studies, (CBT, counselling and computerised CBT studies) that had been carried out in primary care for a similar period and had used the same depression indicators. Benchmarking of the intervention group showed remarkably similar pre and post results in each study (Dobbin *et al.* 2009).

The quality of life data from the Dobbin *et al.* (2009) study was used in an economic evaluation carried out by the Centre for the Economics of Mental and Physical Health, King's College, London, which showed similar cost effectiveness to computerised CBT in moderate depression and greater cost effectiveness in severe depression (Koeser *et al.* 2013). These studies related to a primary care setting, however a feasibility study in the workplace was conducted by Dr J Thompson, which formed her Occupational Medicine thesis (Thompson, 2010a). This study investigated the treatment of mental health referrals to Occupational Health with PMT and found significant reductions in depression, anxiety, burnout and Clinical Outcomes in

Routine Evaluation (CORE) scores over the treatment period (12 weeks) and at 6 months. A limitation of this study was lack of randomisation and control, as it was also a preference study. To address this Dr Thompson benchmarked the CORE scores with the national CORE database and reported that 60% of those that used Positive Mental Training showed a reliable change (Thompson, 2010b)

More recently a randomised study investigating the effect of a positive reappraisal component from PMT on mood and memories has been conducted with students. In this study students were asked to vividly recall a previously identified self-defining negative situation, and then either listened to an instructed reappraisal component or a relaxation control (both for 10 minutes). Results showed that the reappraisal condition led to a significant rise in positive emotions in students in depressed mood, bringing their mood up to the same level as those not in depressed mood (Dobbin, Ross & Phillippe, under review). Recent research looking at the effects of emotional regulation strategies on depression has found that the effects of mindfulness on depression are significantly mediated by re-appraisal (Desrosiers *et al*. 2013).

Positive Mental Training has not, until now, been subject to research in the workplace in a health promotion capacity.

1.8.4 Programme Structure

Positive Mental Training is an audio based programme and consists of 12 audio tracks, each 18 minutes long, and an introductory DVD of 13 minutes (Positive Rewards 2006). A description of the DVD and audio tracks, along with their therapeutic aim can be seen in Table 1:1 Components of Positive Mental Training Programme, below. The programme is modular and designed for the audio tracks to be listened to in sequence. It is advised that each track is listened to every day for a week, before moving onto the next track. This reflects the programmes origins in sport and the idea of practicing techniques to improve performance outcomes. Recent research in pain supports the utility of extended practice (Feuilly, 2013)

Each track in the programme has the same background music and the same voice. The programme is auditory and therefore does not require reading skills. There is however descriptive information in the CD insets.

1.8.5 How Positive Mental Training may have a beneficial effect

Positive Mental Training can be described as a multimodal intervention. This term was used by van der Klink *et al*. (2001) in his review of workplace studies, previously described in section 1.7.2, to describe individually focused mental health interventions which encompassed more than one technique (these researchers used classifications of multimodal, relaxation and CBT). However Positive Mental Training can also be described as a mind body programme, a more contemporary term, as the programme encompasses both somatic and cognitive aspects. PMT includes Jacobsen relaxation exercises, breathing retraining and mindfulness techniques and also encompasses positive psychology philosophy through positive reappraisals and positive suggestions to increase self-confidence and self-esteem.

Positive Mental Training combines a number of validated psychotherapeutic techniques for common mental health disorders. Some of these are similar to those delivered within CBT interventions, such as imaginal therapy, reappraisal and behavioural activation (Longmore & Worrell, 2007). However unlike CBT which delivers these techniques in the context of a Socratic dialogue with the therapist, underpinned by the belief that cognitive reasoning will lead to emotional recovery (Clark, 1995), Positive Mental Training delivers these techniques in an audio format underpinned by research which suggests that emotional change leads to cognitive change (Le Doux, 1999, Damasio,1994).

1.8.5.1 Active Components

While Positive Mental Training shares many similarities with psychotherapeutic techniques generally, there are some specific factors that are known to have beneficial effects that are widely employed in this programme. The core agencies for change that

are present in the PMT programme, which are present in each track underpinning their therapeutic aim, are ***relaxation, attentional manipulation*** and ***positive suggestion***. While each of these are not unique in themselves, their combination is specific to Positive Mental Training. These factors will be discussed individually, and, although they all have an effect in their own right, there may also be the potential for an additive effect. Recent research demonstrated that attentional manipulation and suggestion have an additive effect in reducing distress in pain (Buhle *et al*. 2012); pain is recognised as sharing the same neurological pathways as emotional distress (Craig 2005). Therefore the combination of these two mechanisms in PMT may result in added benefit, an aspect which is investigate in this current author's 3rd study.

1.8.5.2 Relaxation

PMT teaches relaxation and breathing retraining. Section 1.7.2.1 describes many different types of relaxation and the relaxation employed in PMT falls within that described as applied relaxation (AR) (Ost, 1987), which is a relaxation technique which builds upon progressive muscular relaxation by following this after 4 days of PMR practice with release only relaxation (relaxation of muscles with no tensing of muscles first) and after 1 – 2 weeks developing a conditioned relaxation response, focusing on relaxing with the breath. PMT builds on and develops this relaxation by then incorporating, at week three, guided visualisation, a recognised relaxation technique (Benson, 1975; Park *et al.* 2013)

As well as the considerable empirical evidence of relaxation and meditation as individual therapeutic techniques, discussed previously in 1.7.2.1, these two different types of relaxation, i.e. meditation with relaxation therapy have been studied in combination. Results showed that four weekly sessions of this significantly increased SWB and reduced perceived stress in school teachers (Kaspereen, 2012).

1.8.5.3 Attentional Manipulation

Positive mental training makes widespread use of changes in attentional focus. In the first two tracks, which form the foundation of PMT, the individual learns to focus their

attention on their body, specifically on the state of muscular tension and their respiration, and to notice these. In so doing their attention is drawn to the changes and processes of relaxation and breathing. All subsequent tracks use this body focused attentional manipulation at the beginning of each track. Attentional focus is further heightened in PMT by using visualisation (of a safe place) which after being established in the third track is also embedded at the start of every subsequent track. Visualisation has been found to reduce distress in those with depression (Watkins & Teasdale, 2001) and in non-depressed (Homes, Lang & Shah, 2009). Holmes *et al*. (2009, p.76) proposed that '*recruiting imagery will be useful in therapeutic innovations to develop a "cognitive vaccine" for depressed mood*'.

Being able to focus attention on the present moment is a key element of mindfulness (Bishop, *et al*. 2004) and as PMT similarly guides the listener to focus their attention, therefore PMT contains elements of mindfulness. Indeed Bishop *et al*. (2004) describe the use of rigorous meditational practice to induce mindfulness as a form of 'mental training' (p.231). Attentional distraction is recognised to distract from and reduce brooding rumination, an unconstructive way of thinking strongly correlated with depression, effectively reducing vulnerability to depression (Morrow & Nolen Hoeskema 1990).

The second component involved in mindfulness is a non-judgemental observation of mental events (Bishop *et al*. 2004). Similarly hypnosis has been described as a technique which also uses attention manipulation to induce the trance state, which '*sets in motion fronto-limbic processes underpinning the suspension of reality testing and critical evaluation*' allowing, as in mindfulness, non-judgemental self-evaluation (Gruzelier 1998, p.4). Gruzelier's research may help to clarify how attentional manipulation acts as an agent of individual change in Positive Mental Training, particularly in counteracting negative self-evaluation. In an event related potential (ERP) study participants were asked to perform a simple task - press a computer key in the same direction as a green arrow on the screen, or in the opposite direction if the arrow was red. If the participant made a mistake this resulted in an 'error detection wave', a negative deflection at 300ms. This was present in both hypnosis and out of

hypnosis. The evaluation of this detection function resulted in an 'error evaluation wave', which was observed to be present *out of* hypnosis, but absent in hypnosis in medium and high suggestibles. Concurrent with the absence of the 'error evaluation wave' in hypnosis, was a higher rate of error in these participants. Gruzelier noted this was in keeping with the observed decreased amygdala function, evidenced by decreased skin conductance, representing, he proposed, an uncoupling of the cognitive executive and affect functions. This is supported by the findings of Hajcak *et al.* (2003) who found that the level of skin conductance was correlated with the size of the deflection in the error evaluation wave. This may be a mechanism whereby an individual's negative self-evaluation, which would normally cause them to reject a positive statement (suggestion) such as *'you are resourceful'*, is removed, thus disabling the counterfactual effect (McMullen 1980). Accordingly then the statement (suggestion) can be accepted and the positive emotions from this positive suggestion can be assimilated, rather than rejected as it normally might be due to the counterfactual effect. Similarly others have found that a visual experiential processing mode prevents negative comparison (McMullen, 1997, Werner-Seidler & Moulds, 2012). This led Werner-Seidler & Moulds (2012) to propose that visualisation was, like mindfulness, a moment by moment experience.

1.8.5.4 Suggestion

Studies (previously mentioned) have identified that an individual's expectation of an outcome is a key predictor of recovery (Sotsky et al 1991). PMT has a model of recovery that is communicated in a DVD and as well as *every track* containing positive suggestion and visualisations to increase positive future expectation.

As well as using suggestion to increase relaxation, PMT also uses suggestion to increase self-esteem and positive reappraisals. These latter two concepts are discussed below, after a general consideration of suggestion.

Adoption of positive suggestions, as discussed in the 1.8.5.3 Attentional Manipulation, has been found to be influenced by negative self-evaluation. Gruzelier's (1998)

research suggested that under hypnosis such negative self-evaluation did not occur. Although Positive Mental Training, incorporates aspects of hypnosis, in that hypnosis induction utilises attentional training and suggestions of relaxation , as it is neither labelled hypnosis, nor is the word hypnosis used, it cannot be called a hypnotic induction (Hilgard, 1965), Gandhi and Oakley (2005) investigated relaxation *'to experience this whilst being relaxed'* and hypnotic relaxation '*to experience this whilst being in hypnosis'* on suggestibility in students and found that both types of instruction increased relaxation and suggestibility, although the effect was larger with the hypnotic condition (Gandhi & Oakley, 2005, p. 308). This concurred with earlier work by Braffman and Kirsch (1999), who compared imaginative suggestibility with hypnotic induction, and is consistent with the hypothesis that any effect of hypnosis is due to expectation described as the social learning theory of hypnosis (Kirsch, 1991). Therefore it is speculated that the delivery of suggestions along with attentional manipulation will, as with hypnosis, decrease self-evaluation and therefore increase suggestibility.

Other researchers also employ techniques that are very similar to those used in the hypnosis research. The instructions of imaginative suggestibility (Kirsch, 1991) are similar to those employed by other researchers in the field of imagery, e.g. Holmes *et al.* (2009), investigating the effect of re-interpretation on mood, instructed an imagery group to '*imagine each event as happening to themselves'* and a verbal group to *'concentrate on the words and meanings as the description unfolds'* (p. 80). The visual group showed an improvement in mood while the verbal group deteriorated. Similarly, Werner-Seidler & Moulds, (2012) instructed depressed participants, to either *'play the scene over in your head like you are replaying a movie of how the event unfolded'* (p. 473) or else *'think about the meaning of the situation'*. The visualisation instruction allowed assimilation of positive affect, while the thinking group had experienced no change in mood. Rainville and colleagues has noted the process of hypnosis engages visual areas of the brain in fMRI studies (Rainville *et al.* 2002).

Thus it seems probable that hypnosis, attention and visualisation and mindfulness are all related areas which appear to use the same neural pathways. This mental state is

established, reinforced and anchored by the first 4 weeks of PMT along with a beneficial homeostatic state brought about by muscular relaxation and beneficial breathing patterns.

Self esteem

Many tracks in PMT contain suggestions of positive self-esteem. Self-esteem has been identified as being a basic prerequisite for good mental health (Seligman, 1995) and a positive social behaviour (Straface, 2004). Low self-esteem is associated with higher levels of anxiety and depression (Mann *et al* 2004) and predictive of depression (Sowislo & Orth, 2013). Self-esteem has been described as being the evaluative, or affective, component of self-concept, representing how an individual feels about him/herself (Leary & Baumeister, 2000). Anxious people have been found to demonstrate particularly high levels of self-criticism (Cox *et al.* 2004) and this negative self-reference is thought to be the mechanism whereby social anxiety is maintained. Phillips and colleagues (Phillips *et al*. 2010) conducted a meta-analysis of negative self-referential implicit cognitions and depression and concluded that *'negative implicit cognitions are not merely symptoms of depression or temporary consequences of the disorder but also precede its onset'* (p. 704) and recommend that therapies target implicit processes such as this.

Positive Reappraisal

Positive Reappraisal is also a strategy employed in many PMT recordings. Reappraisal involves a change of viewpoint and causes an improvement in mood '*without the need for sustained effort over time'* (Goldin, McRae, Ramel, & Gross, 2008, p.577). Positive reappraisal is the ability to see the outcome as better than before (e.g. losing a job being reinterpreted as a positive opportunity, 'moving on – developing new skills'), as oppose to diminishing negative reappraisal, which is seeing the outcome to be not as bad as it could have been (e.g. reinterpreting losing a job as 'at least my wife's still got a job'). Both types of reappraisal have been found to cause significant lowering of

negative affect and sympathetic arousal, compared to control conditions. However positive reappraisal additionally showed a significantly greater rise in positive affect compared to diminishing negative reappraisal (McRae, Ciesielski, & Gross, 2012).

In depressed people it is believed that the cognitive impairments are likely to affect the ability to use this strategy effectively (Gotlib & Joormann, 2010). Indeed, it has been proposed that failure of reappraisal is a key factor underlying depression (Johnstone *et al.* 2007). Investigating this Dobbin *et al.* (under review) found that a short reappraisal component of PMT was successful at increasing positive affect in depressive students, leading these authors to speculate that the underlying mechanism may have been the removal of the counterfactual effect enabling reappraisals.

It is then thought that positive suggestion, relaxation, self-esteem and reappraisal present in the PMT programme, all contribute towards increasing the positive affect of an individual and this then promotes a cascade of benefits that are associated with wellbeing and resilience, previously described in section 1.5 Positive Mental Health.

An additional underlying mechanism which may also be influenced by attentional manipulation, suggestion and relaxation is cognitive bias and this is investigated in study 3.

Table 1:1 Components of Positive Mental Training Programme

	Track	Programme title	Technique
DVD			Introduction; reassurance and explanation.
CD 1	1	Muscular relaxation 1	Experiential Jacobson relaxation, mindfulness technique.
CD 1	2	Muscular relaxation 2	Experiential Jacobson relaxation, setting of conditioned trigger.
CD 1	3	Mental relaxation 1	Visualisation of safe place and positive future self-affirmations.
CD 1	4	Mental relaxation 2	Reinforcing of visualisation of safe place and ease of access.
CD 2	5	Self Confidence	Suggestion, reappraisal, associating with past positive memories to increase self-confidence.
CD 2	6	Problem Solving	Very deep relaxation with desensitisation techniques.
CD 2	7	Mind/body programming	Demonstrating arm lifting through suggestion to increase self-determinism.
CD 2	8	Trigger the future	Association with past positive experiences and bringing those to the present.
CD 3	9	Distance and Meaning	Distancing and reframing of past events from safe place.
CD 3	10	Love Yourself	Suggestion, visualisation and reappraisal to increase self-esteem.
CD 3	11	Creative Thinking	Suggestion; increasing self-belief and problem solving.
CD 3	12	Vision for the future	Association of positive past performance with visualisation of future.; goal setting

1.9 **Research Framework**

The aim of this research was to evaluate the potential of the intervention, Positive Mental Training, as a health promotion intervention to promote resilience and wellbeing.

In order to undertake this, a staged research design was planned.

1.9.1 **Study 1**

To quantitatively evaluate the programme with healthy volunteers with indices of health and wellbeing pre and post intervention and at follow up. The workplace was acknowledged as a suitable setting to find participants for this longitudinal design. Indicators of mental health and wellbeing were identified from the concepts in the literature, previously described. Validated instruments were used, allowing comparison with other research. A control group was also used to evaluate the specific effects of the intervention, compared to non-specific factors such as attention, expectation, etc.

Study 1 Hypotheses

1. Positive Mental Training will improve wellbeing, resilience and mindfulness, relative to controls.
2. Positive Mental Training will improve mental health and reduce burnout, relative to controls.
3. A higher degree of engagement with Positive Mental Training will be correlated with a greater increase in mental wellbeing and mental health.
4. Any effect of Positive Mental Training on increasing wellbeing, resilience, mindfulness and mental health will increase over the timespan of the intervention and be maintained after the intervention has finished.

1.9.2 Study 2

To extend the focus of the first quantitative study, a qualitative analysis of participants was planned. Interviews were identified as an appropriate method to capture participants' subjective experiences and interpretations of the programme, benefits and limitations of its use. Qualitative methodology allows for deeper and richer exploration of the impact of an intervention which may not be captured with quantitative measures. Interviewees from both the intervention and control groups were sought and a grounded theory method was adopted for interview data analysis.

Study 2 Qualitative Questions

1. What motivates participants to listen to the programme?
2. What are the perceived benefits of the programme?
3. What are the perceived limitations of the programme?

1.9.3 Study 3

To evaluate the underlying mechanisms of the intervention, a component study was undertaken. An active component of the intervention, positive appraisal suggestion, theorised as instrumental in increasing resilience, was isolated, and its ability to increase positive cognitive bias, self-esteem and positive affect, with and without relaxation was investigated compared with a control. Additionally psychological resilience to a stressor (low mood induction) was tested. An experimental research setting was used with student participants.

Study 3 Hypotheses

1. The intervention conditions would give rise to significantly greater levels of self-esteem, positive affect and cognitive bias, and concurrent lower levels of negative affect, compared to a control.

2. The intervention conditions would increase resilience, as measured by the maintenance of positive affect after a low mood induction, compared to the control.

3. Self-esteem suggestions given with relaxation (heightened suggestion) would be more effective, as demonstrated by higher levels of self-esteem, positive affect and cognitive bias, compared to self-esteem suggestions alone and control.

4. Those with emotional vulnerability (as defined by high scores in social anxiety and depression measures and low resilience measure) would exhibit a greater response to the heightened suggestion condition compared to the suggestion only condition.

The evaluation of Positive Mental Training in the workplace (Study 1 and Study 2) employed mixed methodology. Although it has been argued (Blaikie, 2006) that mixing methodologies requires careful consideration and clarity of thought, as abductive and deductive strategies do not share the same ontological assumptions, data from one methodology can be interpreted in the light of another to develop understandings and meanings. Different methodological traditions in research design relate to different views and meanings of reality; and can help to interpret and construct meaning for the evaluation. Using contrasting research methods is called methodological triangulation (Bryman, 2013). 'Triangulation', a term taken from navigation and surveying, but as applied to mixed methods is a way of increasing validity and confidence, because it is assumed that different methods have different biases (Hammersley & Atkinson, 1995) and different methods tap into different ways of knowing (Mathison, 1988).

Study 1

'An Evaluation of the Impact of a Positive Mental Training Programme on Mental Health & Wellbeing of a Working Population'

2 Introduction

The aim of this study was to evaluate the health and wellbeing intervention, Positive Mental Training, and the most common methodological approach used in evaluation research is the experimental design. This research methodology applies the principles of empirical research from the scientific laboratory to the field and looks to establish a cause and effect relationship through hypothesis testing (Ovretveit, 1998). It is widely recognised that the Randomised Control Trial (RCT) is the most effective design for achieving this (MRC, 2000, Gomm, 2004) which it does through methodological control of the impact of confounders, i.e. minimising effects other than the intervention effect on the outcome. This is achieved by creating, monitoring and comparing groups which differ *only* in the variable under study, as far as possible. In clinical studies it is often not possible to have groups differing *only* in the experimental variable, and so researchers incorporate strategies to limit biases and confounding factors where possible. In this current study, consistent with RCT design, an active control was created. This responds to the methodological concerns in the literature that wait list or no treatment controls are less robust, due to expectation factors (Marine *et al.* 2006; Sotsky *et al.* 1991).

Critics suggest that the experimental methodology is too logico-rational (Blaikie, 2006). However, this deductive logic is consistent with the theoretical perspectives of critical enquiry and empirical research evident in this study's field of enquiry, i.e.

clinical psychology and health promotion. The experimental approach uses defined outcome variables that can be objectively measured. This allows for a shared understanding within the scientific community and therefore gives robust comparable data, the cornerstone of sound research making this research more easily understood and its contribution more easily identifiable (Bechhofer & Paterson, 2000). Therefore in this current author's study, as an evaluation of a mental health promotion intervention, and in line with previous researchers and the determinants of positive mental health (previously cited, section 1.5), outcome measures were chosen to assess the main concepts of wellbeing and resilience. Moreover, as mindfulness emerged from the literature as an important component to wellbeing, and in order to assess whether the attentional aspect of PMT did in fact result in mindful changes, a mindfulness measure was also included along with the other measures of positive mental health.

Hypothesis 1: Positive Mental Training will improve wellbeing, resilience and mindfulness, relative to controls.

However health can be conceptualised a continuum (Keyes, 2002) and most mental health interventions outcome studies evaluate indices of poor mental health to gauge the effectiveness of an intervention at promoting recovery from mental distress (van der Klink *et al.* 2001; Marine *et al.* 2006; Czabala *et al* 2011)). Accordingly measures of stress, anxiety and depression were included in this author's study, and as this was a workplace study, burnout was also included as a measure of occupational stress.

Hypothesis 2: Positive Mental Training will improve mental health and reduce burnout, relative to controls.

Health promotion evaluation studies usually include at least one of five aspects – effectiveness, appropriateness, acceptability, equity and efficiency (Philips *et al.*, 1994). This study endeavours to evaluate effectiveness, through hypotheses 1 and 2, and also acceptability, assessed through degree of engagement. Engagement with CBT interventions (including MBSR) and acquisition of skills has been the subject of a

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recent review. The researchers reported that use of CBT skills was not only positively associated with depression treatment outcomes, but also frequency of skill use predicted treatment outcome (Hundt & Mignogna, 2013). It was therefore hypothesised that greater engagement with PMT would be correlated with positive increases in mental health.

> *Hypothesis 3: A higher degree of engagement with Positive Mental Training will be correlated with a greater increase in mental wellbeing and mental health.*

Many health promotion stress management interventions are designed to encourage practice of techniques, e.g. Jacobsen relaxation (Jacobsen, 1938), acquired relaxation (Ost, 1987), mindful meditation (Kabat-Zinn, 1990) as these are recognised as skills to be learnt that are increased with practice, perhaps due to operant conditioning, where the behaviour is reinforced by the reward (Jensen & Turk, 2014). Similarly PMT incorporates relaxation practice over several weeks. Additionally PMT also includes many different psychotherapeutic techniques practiced over several weeks. Hundt & Mignogna (2013)'s review found some evidence that skill use frequency predicted treatment outcome, suggesting a temporal relationship between skills and recovery. Other studies have shown that benefits can remain after the intervention. A Cochrane review found that 3 intervention studies (out of 9 included in the meta-analysis) showed stress remained low one month after the intervention finished (Marine *et al.* 2006). An Occupational Health study that investigated PMT, (Thompson 2010a, section 1.8.3 previously cited), assessed outcomes at 4, 12 and 26 weeks, similarly reported significant improvements over time. All measures (depression, anxiety, burnout and CORE) were significantly improved at 12 weeks (at the end of the intervention) and these improvements were maintained at 26 weeks. Additionally CORE showed a significant improvement between 12 and 26 weeks. It was therefore hypothesised that any benefits from listening to PMT in this current author's study would be maintained after the intervention had finished.

Hypothesis 4: Any effect of Positive Mental Training on increasing wellbeing, resilience, mindfulness and mental health will increase over the timespan of the intervention and be maintained after the intervention has finished.

This study can also be seen in the 'action research' tradition (Blaikie, 2006) as it has the twin objectives of hoping to bring about change, i.e. in the participants' wellbeing, as well as increasing knowledge through understanding how wellbeing is enhanced.

2.1 Ethics and Ethical Considerations

Ethical concerns were considered and addressed to the satisfaction of the NHS Lothian Research Ethics Committee (Appendix 1.1) and University of Edinburgh, Department of Clinical Psychology Ethics Committee (Appendix 1.2) with the following:

2.1.1 Declaring Personal Interest and Reducing Researcher Bias

The personal interests of the Chief Investigator (CI), who is a director and shareholder of Positive Rewards Ltd, the company which produced the intervention programme (Positive Mental Training) were declared. In order to diminish the opportunity for bias and ensure transparency the following features were incorporated into the study design.

I. Although the CI designed the study, including methods of recruitment and data collection, she did not have direct contact with participants or data collection to reduce potential for bias. Therefore an independent research administrator was used for participant recruitment, allocation, data collection and data entry. An independent statistician was used for creation of the locked data set which was then given to the CI for analyses and interpretation.

II. The personal interests of the CI were declared to those supporting this study, i.e. Healthy Working Lives, National Services Scotland and The University of Edinburgh. Also this relationship was explicitly stated on the participant information sheet.

III. There was no direct financial gain to the CI for carrying out this research. The programme was given free of charge.

IV. The study was undertaken as part of a PhD at the University of Edinburgh, under the academic guidance of two supervisors who were independent of Positive Rewards Ltd.

V. The research administrator was blinded to control and intervention group allocation and data entry, through randomisation of participants to groups and the use of Unique ID numbers for participants.

2.1.2 Minimising Participant Bias

Participant bias was reduced through 'blinding' participants to intervention or control programmes, by giving the programmes similar names. The intervention was called 'Verbal Relaxation Training' (VRT) and the control was called 'Music Relaxation Training' (MRT). These names were intended to reduce the potential for differential placebo effects, and to minimise participant disengagement from the control programme which may have happened if it was believed to be ineffective. Additionally using the phrase, 'Verbal Relaxation Training' instead of the actual name 'Positive Mental Training' was intended to reduce the likelihood of participants accessing additional information about the programme from the internet or elsewhere.

The potential for participant cross-contamination was reduced by directly requesting participants not to discuss their involvement with colleagues. It was explained at the entry interview that as this was a research project, whereas it was fine to discuss participation with friends and family, results could be jeopardised if they were to discuss their participation with other work colleagues.

2.1.3 Safeguarding Participants

Participants were fully informed about the study with the information sheet (Appendix 1.3), were given the opportunity to ask the research administrator questions, for which

he had been fully briefed by the CI, and were given time (at least 24 hours) to reflect and consider, prior to deciding whether to participate.

Participants' data was identified by a unique identification number for anonymity and confidentiality. Identifying data, i.e. name and address (necessary for sending out study packs) were kept separately from the data set in a password protected computer and in a locked safe within National Services Scotland, where the study was located. No identifiable data was reported in the results.

Although involving a non-clinical sample of volunteers, the project could have included individuals with undiagnosed depression, anxiety and/or severe stress. If an individual had a DASS score which indicated potentially high levels of mental distress, the participant was contacted confidentially by letter or at interview to inform them of this and to suggest that they consult their G.P.

The study took place in an NHS workplace and the usual workplace protocols for employee health and safety were operating, through Human Resources and Occupational Health.

3 Method

3.1.1 Study Population

The study population comprised self-referred adults, employed within the Lothian offices of National Services Scotland (NSS).

NSS is a large public service organisation, within the NHS, that delivers core services to the NHS in Scotland. These core services are diverse, ranging from business support such as legal, fraud and procurement, to NHS staff support such as operational advice, health statistics, screening and blood management, and are provided through divisions which are geographically spread throughout Scotland. There are ten NSS administrative sites situated within Lothian. Occupational Health and an in-house 'Healthy Working Lives' unit are also sited within NSS Lothian and also have a national remit.

This study recruited from the 10 Lothian sites. These were Elliot House, Gyle, New Royal Infirmary, Ellens Glen Road, Lauriston Road, Anderson House, New St Andrew's House, Scottish Health Services Centre at the Western General in Edinburgh and Bains Square and Earlston House in Livingston. All 1980 employees based in these sites were invited to participate by letter (see Appendix 1.3). Of these employees 1177 (59.4%) were female, 802 (40.5%) male and 1 (.05%) of unknown gender. The majority of employees (81%) described themselves as 'Scottish White', with 6.6% having an ethnic origin other than White Anglo-Saxon.

1658 (83.7%) employees were full-time and 322 (16.3%) employees part-time. The age profile of the employees is shown in Figure 3:1.
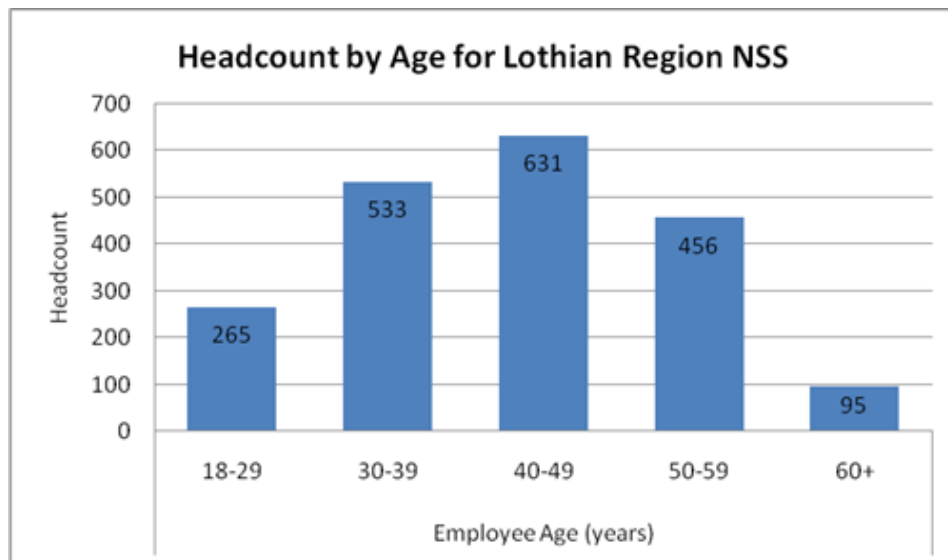
Figure 3:1 Age Profile of Employees of Lothian Region NSS

3.1.2 Exclusions

Exclusion criteria were those with psychotic illness (i.e. Schizophrenia, bipolar disorder (BPD)), family history of BPD, deaf, unable to understand English to a sufficient degree to follow the CD, and/or unable or unwilling to give informed consent. Exclusion criteria were identified by interview when consent was given.

3.1.3 Sample Size

Power calculations used to estimate the number of participants necessary for the study were based on a similar study investigating the effect of Positive Mental Training on depression (Dobbin *et al.* 2009). From this paper an effect size of $d = -2.14$ was calculated (Dunst *et al.*, 2004). This is a large effect size but because the participants in this present study were not clinical cases, but healthy volunteers, and that regression to the mean will show a larger effect size in a clinical population, a medium effect size was calculated as a possible outcome. Therefore for a medium effect size of 0.25, taking alpha =0.05 (which accepts a 5% probability of making a type 1 error) and for ANOVA analysis of variance for 2 groups and for the power of the test to be 0.80 (of rejecting type 2 error) then the number of each group should be 64 (Cohen, 1992).

The overall attrition rate in the Dobbin *et al.* (2009) study was 11%, but for those who received PMT the attrition rate was 18%. However this study was conducted in primary care. A meta-analysis of similar individually focused interventions on work related stress, reported attrition rates that ranged from 0 % to 40%, with a mean of 11% (van der Klink *et al.* 2001). As PMT had not been previously evaluated in the workplace, the attrition had to be estimated. To protect against possible high attrition rates, calculation of the sample size was therefore 100 in each group.

3.1.4 Participant Recruitment Strategy

As the participants of this study were employees within a workplace, it was necessary to obtain the cooperation of managers and union officials before the start of the project. This was achieved by identifying key 'stakeholders' within the organisation from where the research could be administered. The Occupational Health department, and the Healthy Working Lives department, which had a remit for health promotion, were approached in November 2007 and they agreed to support the CI in her research study. This study was supported by these departments, through a grant from the CSO for the NSS 'Promoting Attendance Project', which provided the dedicated time for the research administrator. Another study, 'Positive Mental Training in the Occupational Health Setting' which recruited mental health referrals to Occupational Health, (Thompson, 2010a) was also supported with this grant and ran concurrently with this project.

With the support of these departments, and following an overview of the research given by the CI, at a meeting in November 2008, consent from key stakeholders, i.e. the unions and top level managers, for the CI to conduct the research, was given.

A Flowchart of the study is shown below in Figure 3:2: Flowchart of Study 1, illustrating study design
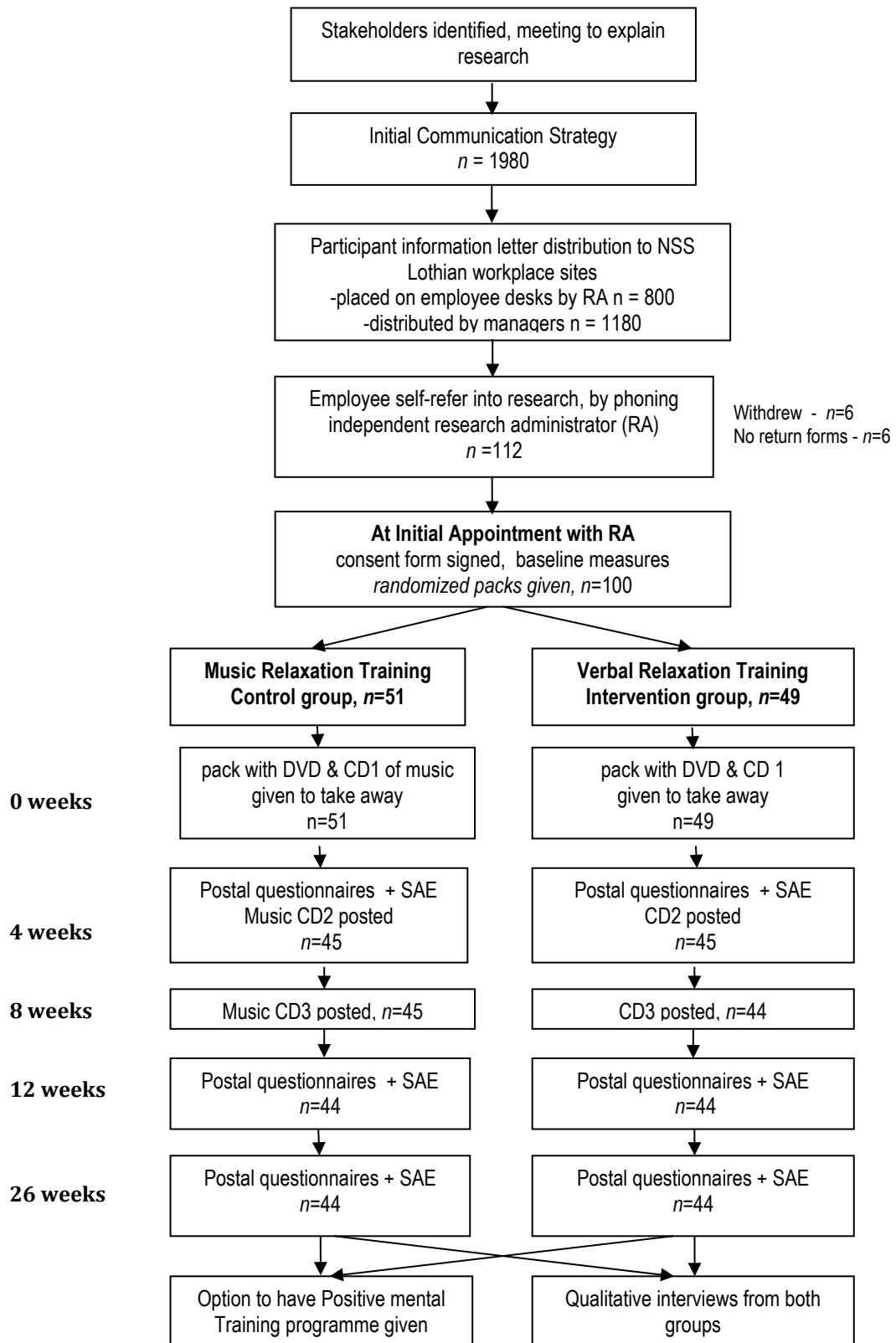
Figure 3:2 Flowchart of Study 1, illustrating study design

3.1.5 Independent Research Administrator

Following ethical guidelines, an independent research administrator was used for participant recruitment and data entry. This person was an NSS employee and was situated within the Healthy Working Lives department. The Chief Investigator (CI) briefed the research administrator on the necessary protocol in line with the research methodology, and supported this with check sheets for the research administrator, see Appendix 1.4 - Participant Entry Interview Protocol Check Sheet for Research Administrator, and Appendix 1.5 summary sheet of Questions and Answers. The CI maintained regular contact, at a minimum once per week, with the research administrator throughout the data collection period through visits, email and telephone. This allowed any concerns to be addressed and the CI to maintain control and management of the project throughout the study period.

There were concerns about collecting data, by proxy, through an independent administrator. There may have been less explanation for questions from participants but this was addressed by good contact, briefing, clear guidelines and debriefing. It was considered that for the requirements of good ethical practice, i.e. transparency and minimising research bias, that the advantages of an independent administrator, outweighed the disadvantages.

3.1.6 Communication strategy

Project graphics were developed to give the research study a unique identity which would immediately communicate the aims of the research, i.e. to building mental health and wellbeing, and so enhance recruitment. The CI developed the design working in collaboration with the in-house graphic designer for Healthy Working Lives, to achieve a clear identity for the study. The poster was titled 'Feel Good ?', the question mark was designed to make the reader question whether or not they felt good, and showed a 'stick' person floating above negative words 'depressed, anxious, stressed, worried etc.' to reach positive words in the sky such as 'strong, relaxed, stay

on top'. The study then became the Feel Good study and the 'stick man' became the logo which appeared on all written material, such as the CDs and the participant packs.

Posters, A4, were designed using the study graphics (see Appendix 1.6) and printed over green, orange, purple or blue backgrounds. A month before the project started these were placed in highly visible areas, such as tea stations, toilets and photocopiers in the research study sites.

The wording on the posters invited employees to find out more and to contact the research administrator through the bespoke telephone line and email and said:

> *'Train your mind to stay on top. Free training programme. To find out more please contact (telephone number) or email (NSS.feedgoodproject@nhs.net) Available from 6th April 2009'*

A page on the NSS intranet site was also set up a month before the project started, which contained a copy of the participant's letter and also a downloadable questionnaire pack so that participants were able to see the questionnaires.

The week the project started a copy of the participation letter was placed on every desk in the Gyle Building, and copies were sent to key managers, at the other sites, to do the same.

3.2 Study Protocol

Participants were recruited between 6th April 2009 and 31st July 2009. Participant data was collected for 6 months from their date of entry; therefore the data collection period was from 6th April 2009 to 31st January 2010.

3.2.1 Participant packs

Participant packs (100 of VRT, 100 of MRT) for 200 participants were prepared in advance of the study starting, in the following way:

Firstly sets of questionnaires, numbered 1 – 200, were prepared for 200 participants. Each set had 4 questionnaire booklets, one for each of the 4 evaluation time periods, i.e. 0, 4, 12 and 26 weeks. Consequently each number (from 1- 200) had 4 questionnaires booklets allocated to it (see appendix 1.7 for sample questionnaire booklet) and was then randomly allocated to either the control (MRT) or intervention (VRT) group and this number was written onto the appropriate CD programme.

Numbers were randomly allocated by a senior member of the Healthy Working Lives Team, who was independent of the study, picking a number from a list of 1 – 200, with a pin, while their eyes were closed. In this way 100 numbers were allocated to VRT and 100 to MRT. The master list of which numbers belonged to which group, was held in a password protected computer, separate from the collected data.

The participant materials, i.e. questionnaire booklets and VRT or MRT, were then packed into envelopes to facilitate posting of materials over the study period. Each participant pack then consisted of 5 different envelopes, each containing:-

Envelope 1   For entry interview - CD1 and DVD. (the questionnaires for entry interview were not packed into the envelope so that the research administrator could be blinded to which group the participant had been allocated to)

Envelope 2   For week 4 - posting of CD2 & questionnaire pack, Stamped addressed envelope (SAE) for return CD1 and week 4 questionnaires

Envelope 3   For week 8 - posting of CD3, SAE for return CD2

Envelope 4   For week 12- posting of questionnaire pack, SAE for return CD3 & week 12 questionnaires

Envelope 5   For week 26 - questionnaire pack, SAE for return questionnaires

The allocated number was written on the outside of the five envelopes making up each individual participant pack and became the participant's Unique Identifying Number for the study. At the first entry interview the first envelope of the five in the participant

pack, with number 1 written on it, was given to the first participant. At the next interview, the first participant pack envelope marked number 2 was given to the second participant and so on sequentially through the list of numbers 1 – 200.

3.2.2 Entry Interview Protocol

Those employees interested in taking part in the study contacted the research administrator via phone or email to make an appointment for an entry interview. To facilitate recruitment the research administrator, who was based at the Gyle, went round to the other NSS sites and occupied a room to make it easier for employees to join up for the study.

At entry interview the employee was asked to sign the study consent form (Form no 1), see appendix 1.8. On receipt of this the employee was given a sealed envelope containing either an intervention or control group DVD and CD 1 with a unique Study ID number written on the outside. This unique ID number was then written onto the consent form, the contact details form (form no 2) see appendix 1.9, and intake questionnaire (form no 3), see appendix 1.10, which the employee then completed. The participant was asked about exclusions. If the exclusion criteria were not met, then the employee completed the questionnaire pack, containing the 5 questionnaires, or took the questionnaires away to complete and return later. If the employee had a high DASS score, (i.e. an anxiety score of 20 or over and/or depression score of 25 or over), then this was discussed with the participant as a potential indicator of anxiety or depression and the participant was advised to contact their GP. The employee took their allocated sealed envelope containing the appropriate DVD and CD1 to listen to at home. To ensure consistency at interview a tickbox protocol sheet was developed for the research administrator (see appendix 1.4). The entry interview lasted about 30 minutes.

3.2.3 Longitudinal Data Collection

Following initial data collection at entry interview (week 0) follow up materials were posted to the participant's address stated on their contact form. Follow up

questionnaire packs were sent out at 4 weeks (along with CD2,) at 12 weeks (the end of the CD programme) and at 26 weeks. CD3 was sent out at 8 weeks.

Participants were asked to return the CDs, with the listening diary, along with the questionnaire packs. It was hoped this would help reinforce the need to return the questionnaire pack and the listening diary, (see 3.4.1 for details of listening diary).

Following each questionnaire mailing, two reminders, at seven day intervals, were given if needed either by phone, email, again as given on their contact form. The research administrator was advised to only focus on week 12, if chasing both week 4 and week 12.

At the end of the study, participants were offered the option to keep intervention.

3.3 The Intervention

The active intervention, used in the current study, was the mental skills training course, Positive Mental Training, previously described in section 1.8. This audio programme uses a combination of techniques, such as relaxation, visualization, desensitising and reframing to improve access to positive memories and experiences in order to bring about a change in thinking style. The CDs used in the current study were the same as in the Dobbin *et al.* (2009) study but re-recorded in the CI's voice (female voice). Each CD track had the same background music but with spoken word content specific to that track, see Appendix 1.11 for sample scripts. A bespoke DVD was made for this study by the CI as described below. Sample research DVD and CDs are attached to the back of cover of the thesis, (for electronic versions please contact this author).

3.3.1 The DVDs

The Positive Mental Training programme DVD as used in Dobbin *et al.* (2009) described the history, uses and created a cognitive framework to help participants engage with the programme, through an understanding of how the various techniques

in each track could aid recovery. In order to blind participants to the active intervention it was not possible to use this original DVD, nor to match this with a similar one for the control group. Therefore it was necessary to make two DVDs especially for this study, one for the control group and one for the intervention group. Each DVD lasted for 9 minutes and contained the same content with the exception of having a short section, of the same length, relating specifically to either the intervention or the control group (see Appendix 1.12 for the DVD scripts). The main content of both DVDs only focused on the benefits of relaxation. The intervention DVD contained a short paragraph on the positive effect of listening to words and the control DVD contained a similarly short paragraph on the positive effect of listening to music, specifically relating to the type of music used, which is music played in the Dorian mode. There was no mention of the history and uses of the programme.

3.3.2 The Control Group CD tracks

The control group was given the background music from the intervention. This was presented in the same format as the intervention, i.e. 4 x 18 minute tracks on 3 CDs, 12 tracks in total. The background music in the intervention was exactly the same for each track and consisted of 4 short sections in the same order. For the control group these 4 short sections were re-ordered to make 12 different tracks, making each track a little different. This was done to make the control music CD less repetitive and to replicate the fact that the intervention had a new track each week.

3.3.3 Visual Presentation of the Control and Intervention Programmes

The Control and Intervention programmes were presented as identically as possible. Each group had identically presented CDs and DVDs, in hard CD cases with the same bespoke designed inset printed on the same colour – blue (see Appendix 1.13). The name of the programme was written on the CD disk, not on the front cover. The relevant CD number or DVD and the unique ID number, necessary as the back of the CD inset was the listening diary, were printed on the front of the CD insets.

The inside of the inset contained 'Instructions for Use' and each group had the same content, presented in the same way, with the exception of a short paragraph relating to either the VRT or MRT programme. Care was taken to ensure a similar number of words were used for each description.

The 'Instructions for Use' were as follows, with the alternative script for the control or intervention highlighted in grey for ease of comparison here:

> *'This CD has 4 tracks on it, each lasting 18 mins. Start with track 1 listening at least once a day for a week before moving on to the next track for a week, and so in this way moving stepwise through the CD. As each track is about relaxation it is important to listen somewhere safe where it does not matter if you fall asleep. **Do not listen if you are driving, operating machinery or are in any situation where safety depends on you being alert.'***

> *Find a comfortable place for yourself to sit or lie down so that you can really relax as you listen to the music/(CD)/. Allow all your muscles to release the tensions of the day and to relax comfortably. Allow the thoughts in your mind to just come and go, notice them without criticism or judgement. As you do this you may find your mind drifts off whilst you are listening, that's ok, just bring your attention back to the music/(words) and enjoy the relaxation that develops as you listen. Even when asleep your unconscious mind is still listening.*

> *As you continue to practice listening and relaxing to the music/(CDs) you may find that it becomes easier and easier to relax at all times, when you are listening to the music/ (CDs), and also at other times. By learning relaxation in a relaxed environment you can begin to learn how to relax when stressed. A useful exercise to do is to notice when you feel tense and when you feel relaxed. Once your brain has learned to relax it will continue to use that skill automatically. When we are relaxed we feel more positive and can cope better with the everyday stresses of life.*

Additionally the MRT CD insets had the following words:

> *This CD is part of a series of 3 which contains music written in the Dorian mode. This is a type of musical scale slightly different from the usual major and minor scales commonly used. This could be said to create a musical language which is more neutral in tone than the 'happy' feeling of a major scale or the 'sad' feeling of a minor scale. The ancient Greeks believed that the type of music listened to could affect an individual's character and subsequently their behaviour. Dorian mode music was believed to help you become stronger.*

And the VRT CD insets had the following words:

> *'This CD is part of a series of 3 which use the positive power of words. Words are very powerful and we easily absorb the negative words around us. This CD can counteract such negative messages to help us feel better about ourselves, more relaxed and more positive, helping us cope better with the everyday stresses of life. By relaxing as you listen you can allow the positive words to sink deep into your mind. It can be thought of as a mental immunisation against stress.'*

The back page of the inset was identical for each group and contained the listening diary (described in the next section 3.4.1).

3.3.4 The On-body CD text

The CDs were printed with the name of the programme, i.e. Verbal Relaxation Training or Music Relaxation Training; the number of the CD, i.e. CD1, CD2, CD3; the 'feel good' logo and the specific names of the tracks. MRT tracks were labelled 'music 1' through to 'music 12'. The VRT tracks were labelled with the track title as detailed in Table 1:1 Components of Positive Mental Training Programme. (See back cover for sample discs.)

3.4 Instruments

3.4.1 Listening Diaries

Participants were asked to record, on a 'tick-box' style table, how often they listened to the CD tracks on each CD. This table was printed on the back of the CD inset and participants were asked to return this with the CD and questionnaires. The wording on the CD inset was:

'As this is a research project, we are interested in the number of times you have listened to each track. Please tick the days you have listened and send this back along with the questionnaires and CD. Your honesty is appreciated. Thank you.'

As there were 3 CDs, there were 3 of these listening diaries to complete and return. The 'ticks' were added together at two time intervals, 4 weeks (CD1 data) and 12 weeks (CD1, CD2, CD3 data), to correspond with questionnaire data collection at these times. This formed 2 new variables:

'SumCD1' - the sum of the number of times CD1 had been listened to (i.e. at 4 weeks after completion of the first CD).

'Sumtracks' - the sum of the number of times CD1, CD2 and CD3 (i.e. at 12 weeks, after completion of the whole programme).

3.4.2 Questionnaires

Participants were asked to complete questionnaires to measure the impact of the intervention. These were self-completion questionnaires as described below and are standardised, published measures. Scoring was undertaken according to published guidelines and is specified below with the descriptions of each scale. Questionnaires were prepared as a booklet and presented in the same order for all participants at every stage of the study. Counterbalancing of the order of the questionnaires was considered, but rejected for the following reasons. Firstly it was felt that some scales should always precede other scales, e.g. the DASS or the Burnout scales should not be the last scales as they ask about negative feelings and it was not the intention to leave participants dwelling on this. It was deemed easier to make up the packs if the questionnaires were in the same order and although there may be an order effect from this, this effect will be the same in both control and intervention groups. Additionally it was thought that keeping the same order would reduce data entry mistakes (personal communication, M. Gaffney, Healthy Working Lives, December 2008).

The order of the questionnaires was: The Connor-Davidson Resilience Scale (CDRISC – 10); the Maslach Burnout Inventory (MBI); the Depression, Anxiety and Stress Scale (DASS 21); the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS); and the Freiburg Mindfulness Inventory (FMI). The principal outcome measure (CDRISC)

was placed first to ensure that it was not influenced by any preceding measures. The second scale, MBI, was placed before the DASS because it was shorter, therefore quicker to complete and more encouraging in terms of completing the whole questionnaire pack. It was considered that the MBI would be less likely to influence the DASS, than the DASS would be to influence the MBI as the MBI is about work in general, whilst the DASS is more concerned with affect and so may make a participant think more negatively about work. The WEMWBS was placed after the DASS to give participants the opportunity to replace any negative affect engendered by the DASS questions, with the more positive focus of the WEMWBS. It was considered important to end the task of questionnaire completion with positive questions and a positive focus, so as to leave participants at least feeling no worse than at the start of the task. The FMI was considered the most difficult to complete as it is more abstract in nature and so was placed last to reduce potential for non-completion of other items.

3.4.2.1 Connor-Davidson Resilience Scale 10 (CD RISC10) (see Appendix 1.7)

There are relatively few measures of resilience and fewer for measuring resilience in adults (Ahern *et al.* 2006). Some scales reflect the fact that resilience is a multidimensional concept by having subscales, but there are problems with these, not least that there is no agreement on the definition of resilience (White *et al.*, 2008). The scale used here is a short form of the Connor-Davidson Resilience Scale (CD RISC) (Connor & Davidson, 2003). The original CD RISC is a unidimensional, 25 item scale which has been demonstrated to be sensitive to change in clinical groups and is recommended by the authors as suitable to measure resilience interventions. It is based on constructs of hardiness, control, commitment, change viewed as challenge, goals, action orientation, self/esteem, confidence, adaptability, social problem solving, humour, strengthening effects of stress, affectional bonds, previous experiences of success, endurance/patience and faith/belief and validated against hardiness, perceived stress, vulnerability scales. The CDRISC scores of whole sample were significantly correlated with the Sheehan Stress Vulnerability Scale (n=591, Spearman r = -.32, *p*< .001) and the Sheehan Social Support Scale (n=591, Spearman *r* =.36, *p*< .001). The

psychiatric outpatients group was significantly correlated with Kobasa Hardiness Measure (n=30, Pearson $r = 0.83$, $p< .001$, the Perceived Stress Scale, (n=24, Pearson $r = -.32$, $p< .001$) (Connor & Davidson, 2003).

Campbell-Sills and Stein (2007) completed a factor analysis on the CD-RISC and found a four factor analysis fitted best; the four factors being 'Hardiness'(10 items), 'Social Support/Purpose'(4 items), 'Faith'(2 items) and 'Persistence' (7 items), but found that this was unstable across similar populations. They resolved this through modifying the scale to one with 10 items – the CD RISC 10, by removing the unstable items relating to 'Faith' and 'Social Support/Purpose' and abridging 'Hardiness' and 'Persistence' which were found to measure the same underlying construct, due to similarly worded items causing the appearance of a separate factor. With these excess items removed a single factor model fitted best (determinacy value .93 for resilience factor) with good internal consistency, (Cronbach's alpha of .85 in an undergraduate population). The remaining items in the scale reflected a single construct – resilience, which contained the ability to tolerate experiences such as change, personal problems, illness, pressure, failure and painful feelings. Construct validity was confirmed by the Brief Symptom Inventory 18 (BSI) and Childhood Trauma Questionnaire Short Form (CTQ-SF). Results showed that CDRISC10 moderated the relationship between childhood maltreatment (measured by CTQ-SF) and current psychiatric symptoms (measured by BSI), $r=.56$, $F(3,126) =19$, $p<.001$, meaning, the authors suggest, that CDRISC10 was able to measure positive adaptation to difficult events.

This CDRISC10 single factor scale has been chosen for this study because as well as being psychometrically sound, it is quicker to complete than the CDRISC, an important consideration as there were 5 separate questionnaires in this study. Although it had not been used to measure change in resilience following an intervention, unlike the original CDRISC, because the CDRISC-10 is strongly correlated, ($r=.92$), with the original 25 item questionnaire, it was considered reasonable to expect the CDRISC 10 would have the same ability.

The CDRISC 10 has 10 positively worded items, graded on a 5 point scale – *'not true at all', 'rarely true', 'sometimes true', 'often true'* and *'true nearly all the time'* and measures resilience over the last month. Each item is scored from 0 – 4 respectively, and summed together for a total resilience score, which will lie between 0 – 40. A higher score reflects higher levels of personal resilience.

3.4.2.2 Maslach Burnout Inventory - General Survey (MBI-GS) (see Appendix 1.7)

This questionnaire is a work related burnout scale, widely used in workplace studies, with good psychometric properties. The MBI-GS (Maslach *et al.*, 1996) was used in this study and this is an adaptation of the original Maslach Burnout Inventory Human Services Survey (MBI-HSS) which was specifically devised for those occupations providing human services. The MBI-GS is a modification of the MBI-HSS for those in occupations that do have direct contact with service recipients. Therefore whereas the MBI-HSS measures the relationship with people at work, the MBI-GS measures one's relationship with work per se, on a continuum between engagement and burnout. As participants in this current study were drawn from non-clinical staff, the MBI-GS was identified as being more suitable than the MBI-HSS. The MBI-GS has 3 subscales (dimensions) which are exhaustion, cynicism and professional efficacy. The first two are positively correlated with burnout and the latter is negatively correlated with burnout. The MBI-GS has been widely used with different occupations in many countries and shows good internal consistency, for example Cronbach's alpha of .89 for exhaustion, .80 for cynicism and .76 for professional efficacy (Maslach *et al.*, 1996). External validity has been demonstrated through relating the subscales to other constructs. Exhaustion is associated with mental and physical strain, work over-load and role conflict at work. Professional Efficacy is related to satisfaction, organisation commitment and job involvement, and Cynicism positively associated with the constructs of Exhaustion and negatively associated with the constructs related to Professional Efficacy (Schaufeli *et al.*, 1995).

This measure was chosen as the study was situated within the workplace, with participants drawn from the working population and burnout is a work related issue. It has 16 questions scored on a 7 point likert scale which measure frequency of feelings over the last year. Statements are rated from *Never, A few times a year or less, Once a month or less, A few times a month, Once a week, A few times a week, Every day*, and are scored 0 – 6 respectively. There are no reverse items and dimension scores are a sum of the items relating to that dimension, divided by the number of items in that dimension subscale. There are 5 items which refer to Exhaustion subscale, 5 items which relate to Cynicism subscale, and 6 items which relate to Personal Efficacy subscale. Total subscale scores then range from 0 – 6. Exhaustion and Cynicism are positively correlated with levels of burnout and Personal Efficacy is negatively correlated with levels of burnout.

3.4.2.3 Depression Anxiety and Stress Scale - short form 21 (DASS 21) (see Appendix 1.7)

This scale was chosen for this study as it encompasses, and can discriminate between, depression, anxiety and stress, in one relatively short questionnaire. It is suitable for non-clinical samples, and has good psychometric properties, as detailed below, from a normal UK adult population.

The DASS 21 is a shortened form of the original 42 item DASS (Lovibond & Lovibond, 1995). The DASS was developed to differentiate between anxiety and depression, in response to the observed high degree of correlation and overlap between items in existing measures of anxiety and depression (Clark & Watson, 1991). During development of this scale a 3rd subscale emerged, that of stress, which supported the concept that psychological health is a dimensional concept on a continuum. This concept fits well with the idea of building mental health and fits with the tripartite theory of anxiety and depression proposed by Clark and Watson (1991).

The 21 and 42 items scales have 3 subscales, namely depression, anxiety and stress, which can either stand alone or be combined to create a single measure of emotional

dysfunction. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia; the anxiety scale assesses autonomic arousal, skeletal musculature effects, situational anxiety and subjective experience of anxious affect; and the stress scale assesses difficulty relaxing, nervous arousal, easily upset/agitated, irritable/over-reactive and impatience. Stress is factorially different from depression and anxiety, although all 3 conditions are moderately inter-linked.

DASS-21 scores, when doubled, can be directly compared with DASS scores (Lovibond and Lovibond, 1995). Internal consistency is good for both the DASS and DASS-21, with Cronbach's α of 0.94 for Depression, 0.87 for Anxiety and 0.91 for Stress being demonstrated for the DASS-21 (Antony *et al.* 1998).

Good external validity of DASS-21 has been demonstrated, with the depression scale most strongly correlating with the Becks Depression Inventory (BDI) (n= 258, r =.77), the Anxiety scale with the Becks Anxiety Inventory (BAI) (n = 258, r= - .84) and the stress scale with both (n = 258, r = .62 for BDI, r = .64 for BAI). Crawford (2003) provided UK normative data for the DASS-42, from the general population, as well as demonstrating DASS high internal consistency and good correlation with the Hospital Anxiety and Depression scale (HADs): [All n = 1512, DASS-D / HADS-D: r = .66, DASS-A / HADS-A: r = .62, DASS-S / HADS-A: r = .71]; the Personal Disturbance Scale (sAD), [All n = 733, DASS-D / sAD-D r=.78, DASS-A / sAD-A r =.72, DASS-S / sAD-A r=.67], and Positive and Negative Affect Scale (PANAS) [All n = 740, DASS-D / NA r =.60, and PA r =-.48, DASS-A/NA r=.60, , DASS-S/NA r=.67,].

The DASS-21 asks the participant to rate statements as to how much they applied to them *over the last week*, on a scale from 0 – 3, where 0 *is did not apply*, 1 is *applies to some degree*, 2 is *applies to a considerable degree* and 3 is *applies very much*. It is therefore intended as measure of state rather than trait attributes. The scores for each of the individual items relating to each factor (7 items for each factor) are summed together and doubled to give the DASS factor score, making the score comparable with DASS-42 data. The sum of all 3 subsets gives the total DASS score.

3.4.2.4 Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (see Appendix 1.7)

The WEMWBS (Tennant *et al.*, 2007) is a measure of wellbeing, encompassing both the eudaimonic (psychological functioning & self-actualisation) and hedonic aspects (subjective wellbeing) of positive mental health as a unidimensional measure.

The WEMWBS was developed in response to the need for a short wellbeing measure that encompassed both the eudaimonic and hedonic aspects of wellbeing, did not encompass ill health, was unlikely to be affected by ceiling effect, and could be used to measure health promotion initiatives and wellbeing at a population level. It was developed by a group of mental health experts who drew on academic literature and qualitative research with focus groups, to modify an existing scale, the Affectometer 2 (Kammann and Flett, 1983). Psychometric validation of the Affectometer 2 for the UK population had previously revealed several limitations, i.e. response bias and overly high internal consistency, indicating items were duplicated, (Tennant *et al.* (2006). The group addressed these shortcomings by removing items which were negatively focused or hard to understand and adding in those concepts which were felt to be missing.

WEMWBS is a measure of mental wellbeing that focuses solely on the positive aspects of mental health and is unlikely to show ceiling effects. It encompasses positive affect (feelings of optimism, cheerfulness and relaxation), satisfying interpersonal relationships and positive functioning (energy, clear thinking, self-acceptance, personal development, competence and autonomy). It is a short self-assessment scale with 14 items; all worded positively and answered in the timeframe of the last two weeks on a 5 point scale, – *'None of the time', 'Rarely', 'Some of the time', 'Often' and 'All of the time'*. Responses are scored 1 – 5, respectively and added together to give a wellbeing score. The minimum score is therefore 14 and the maximum score is 70. A higher WEMWBS score then indicates a higher level of mental wellbeing.

WEMWBS has good psychometric data, tested on student and a normal populations, with a Cronbach's α of 0.89 in the student sample, and 0.91 in the population sample

(Tennant *et al.* 2007). The authors suggest, however, that there may be redundant questions and therefore the scale may in the future be shortened.

The WEMWBS correlates well with other measures of affect or wellbeing, i.e. Positive and Negative Affect Scale (PANAS), PA: $r =.71$, $n=63$, NA: $r=-.54$, Scale of Psychological Wellbeing (SPWB): $r=.74$ $n=63$, WHO Wellbeing Index (WHO-5): $r=.77$, $n=79$ and life satisfaction scales, i.e. Satisfaction With Life Scale (SWLS): $r=.73$, $n=79$ and Global Life Satisfaction(GLS): $r=.53$ $n=79$, and the Emotional Intelligence Scale (EIS): $r=.48$, $n=67$, indicating good external validity. WEMWBS has not been reported to suffer from floor or ceiling effects in studies (Tennent *et al.* 2007). Additionally, a recent meta-analysis of studies (including data from this study) using WEMWBS has shown that this scale is sensitive to changes in a wide range of mental health promotion interventions, at both individual and group level (Maheswaran *et al.* 2012). The WEMWBS scale was selected for the current study as it has been developed to evaluate mental health initiatives in the UK, and at the time of choice was being used as an evaluation tool for Positive Mental Training in another study in the UK (personal communication Sandwell PCT, 2008).

3.4.2.5 The Freiburg Mindfulness Inventory (FMI) (see Appendix 1.7)

The Freiburg Mindfulness Inventory (FMI) was developed to capture a broader conceptualisation of mindfulness than other similar scales (Walach *et al.* 2006) and was chosen for this study as it best fitted the researcher's conceptualisation of mindfulness and the attributes that Positive Mental Training may influence. The FMI captures attention and awareness, as does the Mindfulness and Attention Scale (MAAS) (Brown & Ryan, 2003), but also includes assessment of a non-judgmental and accepting attitude. The Kentucky Inventory of Mindfulness Scale (KIMS) (Baer, 2004) also captures these elements, but was rejected as it is considerably longer, having 39 items.

The FMI is available in the full form with 30 items and a short form with 14 items. The original longer item scale was developed from expert interviews and an extensive

literature review and resulted in a psychometrically sound 30 item scale, with an internal consistency of Cronbach's alpha = .93. This scale was able to demonstrate change in mindfulness in people attending mindfulness meditation retreats (n =115, p<.001). Applying this scale to a general population, i.e. those without meditation experience, some items emerged, which lowered the reliability of the scale. On removal of these items a shortened scale consisting of 14 items emerged. This 14 item scale had good internal consistency when tested with the meditators and a clinical sample (Cronbach's α = .86), the general population (Cronbach's α = .79) and a mixed sample (Cronbach's α = .86). The short version strongly correlates with the full version (r = .95, n = 246; Walach *et al.*, 2006). Component analysis of both the full and shortened scales indicated that the scales are unidimensional.

External validity has been demonstrated with positive correlations with the Self-Awareness Questionnaire (SAM, self-knowledge subset: r =.55, n = 129) and years of experience of mediation: r = .28, n =129. Negative correlations were demonstrated with the Questionnaire of Dissociative Symptoms (FDS): r=-.31, n = 129, and a clinical measure of psychological distress (SL90 –symptom checklist): r = -.40, n = 246 (Walach *et al.* 2006).

The shorter 14 item version was chosen for this study as it has also been found to be psychometrically robust in normal and clinical populations, identifying a significantly different mindfulness score between these populations. The short version has been developed for a non-meditating population and so is intended to be easy to understand. The 14 items are positively phrased and rated on a 4 point scale – *rarely, occasionally, fairly often* and *almost always*, on a timescale of the *'last few days',* intended to capture the 'state' aspect of mindfulness. Responses are scored 1 – 4 respectively, with the exception of item 13 which was a reversed item and so this item was recoded - 1 into 4, 2 into 3, 3 into 2 and 4 into 1. All items are then summed to give a total FMI mindfulness score, ranging 17 – 53; a higher score indicating greater mindfulness.

3.5 Analytical Plan

3.5.1 Independent Statistician

The CI created the SPSS template for the independent statistician who then created a locked dataset for analysis by the CI.

3.5.2 Analytical Process

The statistical packages SPSS 17 and Stata 13 were used to run the analyses.

The data was firstly explored for quality by looking at outliers and missing data. The data was then investigated to see if assumptions of normality were met and if parametric analysis was appropriate. Control and intervention group demographics were compared at baseline to establish that there was no statistical difference between the groups at the start.

3.5.3 Hypothesis Testing

Each hypothesis was tested using the appropriate statistical test. Longitudinal analysis using a mixed model, multi-level linear approach was adopted for hypothesis 1 and 2. Using Stata 13, a panel design was employed to run a random effects maximum likelihood regression model, with the outcome variable as defined by hypothesis e.g. wellbeing; time and listening as the time variant fixed effect predictors, and gender, group, age, place of work, and hours of work as random effect (time invariant) variables. As a random effects model, unobserved effects of the individual and of the fixed effects were also factored in, along with the residual, and unobserved error of this. A purely fixed effects approach does not take account of time constant variables, i.e. variables that do not change with time, which in this study were gender, group, age (over the study period), place of work and full- time or part-time work (hours of work). Time and listening were added into the model as a time variant predictors of the outcome variable.

Analysis of covariance (ANCOVAs) was used for cross-sectional analysis at each time point, to answer hypothesis 3. SPSS 19 was used, with the outcome variable baseline measure as the covariate and group as the fixed factor.

4 Results of Study 1

4.1 Data Collection

100 participants entered the study. Outcome questionnaire data was collected at baseline (week 0), week 4, week 12 and week 26. The flowchart below, Figure 4.1, Flowchart of numbers of participants in Study 1, illustrates the number of participants at each stage.

Additionally, listening information was collected as an indication of adherence to the suggested listening routine of the audio programmes. Participants recorded the amount they listened to each CD on a 'listening diary' printed on the CD cover, which was returned along with the CD1 at 4 weeks, CD2 at 8 weeks and CD3 at 12 weeks.

Table 4:1 Pattern of Data Collection, shows the pattern of data collection in detail over the study period, along with whether the participants completed any listening diary information. Overall full outcome questionnaire data was collected for 33 participants (although 3 did not complete any listening information). 26 participants completed the outcome questionnaires at week 0 only, 1 participant only supplied data at week 26 and 41 participants completed questionnaires at two or three data collection times.

Table 4:1 Pattern of Data Collection showing number of participants who completed questionnaires in the weeks indicated, plus listening diary information

No of participants returning questionnaires and listening diaries at time points		
	Total returned	Listening diary completed	Listening diary not completed
all four times	33	30	3
Baseline only	26	2	24
baseline + 4 week only	11	10	1
Baseline + 12week only	2	2	0
Baseline + 26 week only	7	1	6
Baseline + 4+ 12 weeks	2	2	0
Baseline + 4+ 26 weeks	4	4	0
Baseline + 12+ 26 weeks	12	4	8
4 + 12 + 26 weeks	1	0	1
12 + 26 weeks	1	1	0
26 week only	1	1	0
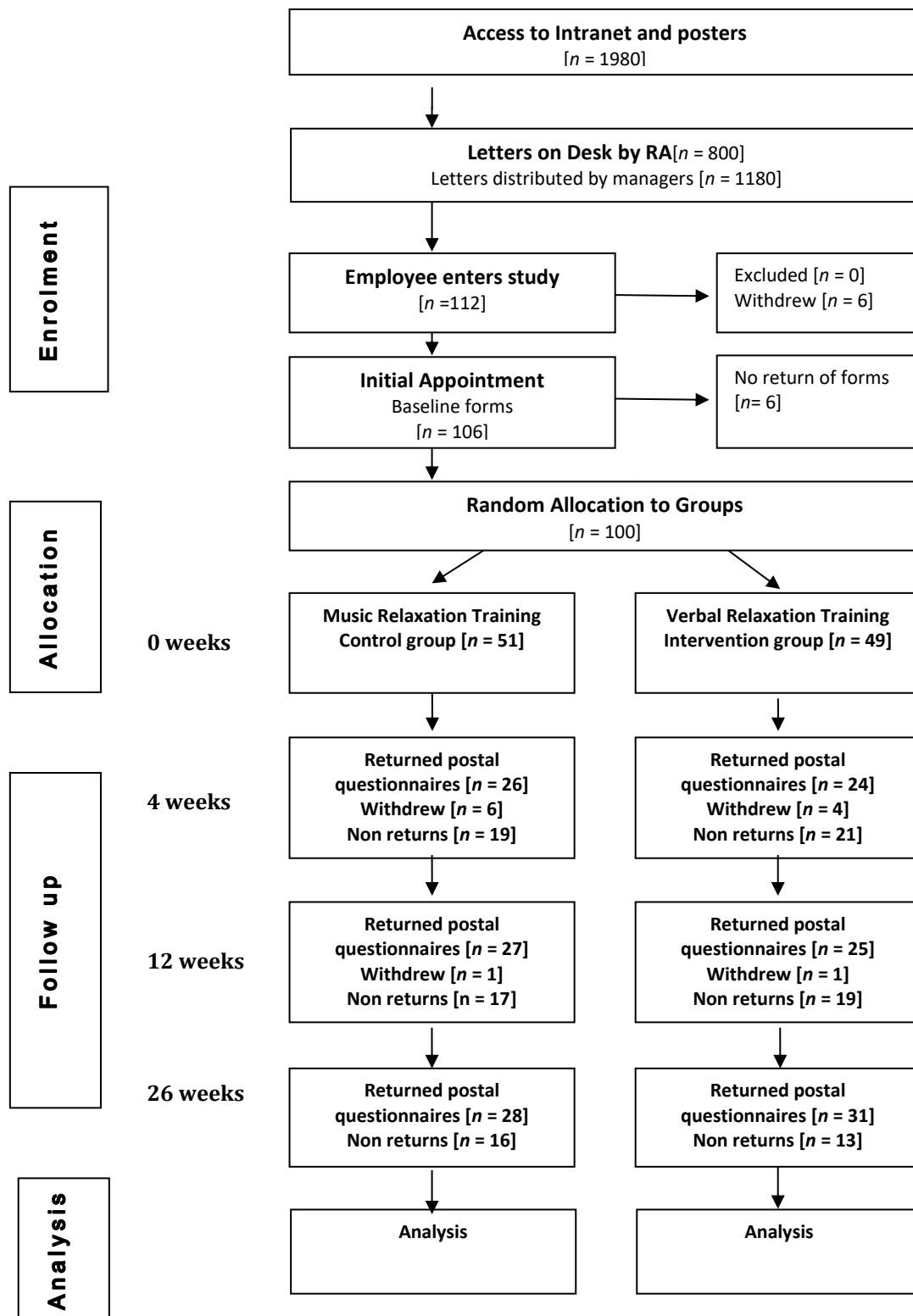
Figure 4:1 Flowchart of numbers of participants in Study 1

4.2 **Demographics of Participants**

69% of participants were women, and 31% men. The distribution within the control and intervention groups was similar. Table 4:2 details participant demographics, i.e. distribution of age, sex and full or part time employment within the two groups. Box plots of these data can be seen in Appendix 2.1. Statistical tests, either independent t test *(t)* or chi squared test (χ^2) confirmed that there were no significant differences between the groups on any study variable at baseline, indicating that randomisation was successful. The pattern of attrition is described later in Table 4:3 Number and Percentage of Missing Variable Data, and shows that missing data was not related to group allocation.

Table 4:2 Table of demographics for control and intervention groups

	Control (n=51)	Intervention (n=49)	Significance
Age – mean years	43 (SD 9.14)	42 (SD 9.82)	t(98)=.71, *p = .479, ns*
Age – range in years	26 – 58	25 – 65	
% of participants Female Male	68.6% (*n* =35) 31.4% (*n*=16)	69.4% (*n*=34) 30.6% (*n*=15)	χ^2 (1) =.007, *p=1.00, ns*
Full time work Part time work Missing data	78.4% (*n*=40) 19.6% (*n*=10) 2% (*n* = 1)	87.8% (*n*=43) 12.2% (*n*=6) 0%	χ^2(1)=1.098, *p=.414, ns*

4.2.1 Place of Work

Participants were asked to record their place of work and Figure 4:2 Barchart of place of work of participants shows the results of this, displayed for both control and

intervention groups. From this barchart it can be seen that both groups had a similar participant distribution of place of work.
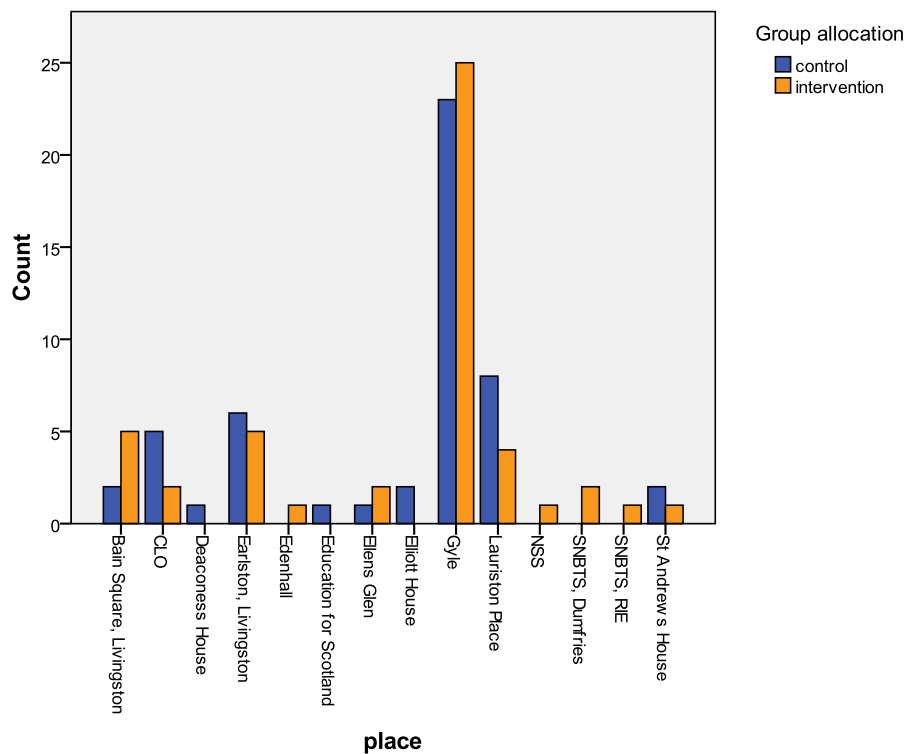
Figure 4:2 Barchart of place of work of participants in the control and intervention groups

4.3 Missing data

Missing data is summarised in the pie charts below, which show that; 32 of the 46 variables had some data missing; 30 of the participants had complete data sets, and overall just over 31% of data values were missing.

Overall Summary of Missing Values
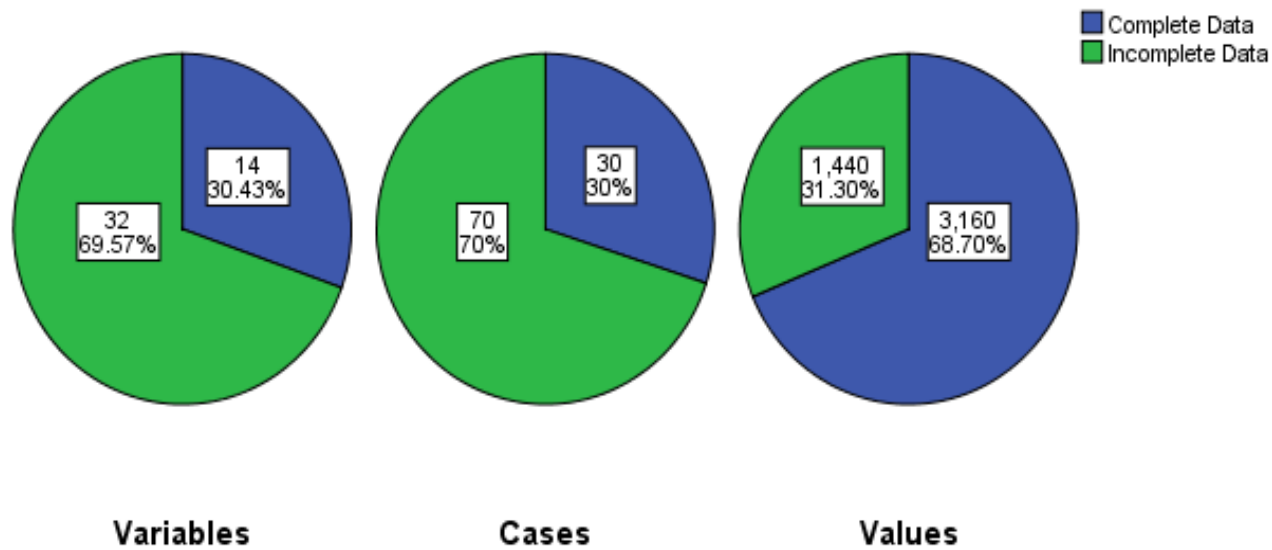
Figure 4:3 Summary of missing data indicating the number and % missing of variables, cases (participants) and items (values) in the dataset.

Missing data came about for the following reasons; single item scores missing from individual questionnaires; participant non return of questionnaires; and participant withdrawal. The latter two reasons were the most dominant and numbers for these can be seen on the flowchart, Figure 4:1 Flowchart of numbers of participants in Study 1.

How missing data is treated has consequences for the statistical analysis. Missing data could represent:

- Everyone stayed the same i.e. no change from baseline

- Everyone changed from baseline

- Some participants changed and some did not, through perhaps an aspect of the study, such as the amount listened or group.

- Lost questionnaires

Missing data can be categorised into 3 different types of missingness – MCAR (missing completely at random, i.e. the missing values are not related to the variables

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being collected), MAR (missing at random, i.e. missingness on one variable is correlated to other measured variables in the study) and MNAR (missing not at random, i.e. missingness is directly related to the variable that is missing).

4.3.1 Missing Data at Baseline

Table 4:4 Variable Data: Number, missing cases*, central tendencies and distribution at baseline, week 0 shows the number of missing entries (cases) at week 0 (baseline) for each questionnaire, which, with the exception of the Maslach Burnout Inventory: Emotional Exhaustion variable at 7%, fell on or below 5% of the total responses.

There are a number of ways missing data can be dealt with. It is considered acceptable practice in a RCT to replace missing cases at baseline with the mean (White & Thompson, 2005). Imputation with the mean is ordinarily not considered advisable due to the probable underestimating of variance and dilution of associations. However, as this was a randomised trial, baseline measures can be considered as independent of treatment group. Little's MCAR test (Little, 1988) was carried out on the baseline data and resulted in a chi-square = 28.304 ($df = 41$; p=.934), which indicated that the data was indeed missing at random (i.e. no identifiable pattern existed to the missing data): 'Missingness' of a value was unrelated to another value and unlikely to affect inference (Bartlett, 2011b), and therefore imputing means could be used for missing baseline measures. Additionally the % of missing data at baseline was low, and Field suggests that with 5% missing data it is reasonable to replace this with the mean (Field, 2009). Accordingly, it was considered that because, all but one (which had just over 5%) of the variables had 5% or less missing, that it was within the accepted tradition to replace these missing values at week 0 with sample mean values.

4.3.2 Missing Data at Follow Up

Missing data at follow up was more problematic as the extent of missing data was much greater. As documented in the flowchart Figure 4:1 Flowchart of numbers of participants in Study 1, there were many questionnaires not returned at the weeks 4, 12 and 26, resulting in approximately 50% of data missing. Longitudinal missing data

was further explored for missingness and is displayed in the table below, Table 4.3. This shows that the missing data was evenly distributed by group and gender and the pattern was that of complete questionnaires missing, with only the occasional individual missing item score. Little's test for MCAR was non-significant, $\chi^2 = 21.261$, ($df = 2750$, $p=.1$), meaning that the study data was MCAR.

Table 4:3 Number and Percentage of Missing Variable Data at weeks 4, 12 and 26 showing distribution by group and gender

		4 weeks			12 weeks			26 weeks		
Group	Gender	missing		Variables missing	missing		Variables missing	missing		Variables missing
		no	%		no	%		no	%	
control	F	18	51	all outcome variables	20	57	all outcome variables	18	51	all outcome variables
		1	3	DASS_A, DASS only	1	3	MBI_EX, WEMWBS only	1	3	DASS_S, DASS only
		14	40	Listening variable	14	40	Listening variable	14	40	Listening variable
	M	7	41	all outcome variables	4	25	all outcome variables	5	31	all outcome variables
					1	6	FMI only			
		5	31	Listening variable	4	25	Listening variable	4	25	Listening variable
PMT	F	17	50	all outcome variables	17	50	all outcome variables	12	35	all outcome variables
					1	3	DASS ALL, WEMWBS only			
		12	35	Listening variable	11	32	Listening variable	11	32	Listening variable
	M	8	53	all outcome variables	8	53	all outcome variables	6	40	all outcome variables
		1	3	FMI only	1	3	FMI only			
		8	53	Listening variable	8	53	Listening variable	8	53	Listening variable

DASS –Depression, Anxiety & Stress Scale; DASS _A –Depression, Anxiety & Stress Scale: Anxiety subscale; DASS_S – stress subscale
MBI_EX – Maslach Burnout Inventory: Exhaustion scale; WEMWBS - Warwick & Edinburgh Mental Health Wellbeing Scale
FMI – Freiburg Mindfulness Inventory

The fact that the data is MCAR implies that complete case analysis will reflect a non-biased sample and therefore indicate 'true' results. However a limitation of complete case analysis is the reduction in power due to the smaller sample size. According to J Bartlett (Bartlett, 2011a) participants with baseline, but with follow-up data missing, do not contribute information about the treatment effect, and so excluding participants with missing follow-up, is most likely the best approach.

Many researchers will impute missing data in a number of ways to allow analysis of all those who entered into the study. There are many approaches to imputing missing data and it is generally recognised that with missing data above 5% it is better to use methods other than single imputation approaches, such as multiple imputation (MI) or maximum likelihood (ML) (Baraldi & Enders 2010). MI creates multiple datasets, which are analysed and different parameter estimates and errors created which are then pooled into a single result. ML uses a different technique whereby all the data is used to create population parameter values with the best chance of producing the sample data. This is achieved through a mathematical function (log likelihood) which estimates the minimum distance between observed data points and parameter means. Of the single imputation methods hot decking is thought to be one of the better techniques. This technique matches 'donor' cases using categorical variables such as gender and age, to provide data for those missing cases.

These 3 techniques were investigated and each were found to have their limitations. The hot decking did not impute a full dataset (between 65-70% complete), which was thought to be due to the small dataset and the limited number of 'donors' available. The ML techniques generated non real values in the imputed questionnaires, i.e. minus scores in the questionnaires and the MI technique was limited by the statistical package being employed (SPSS did not pool the results).

As was demonstrated here and is widely recognised there is no ideal way of carrying out missing data imputation, each has its problems and statistical limitations, and therefore CONSORT guidelines no longer ask for intention to treat analysis (Schulz *et al.*, 2010). Rather it is preferable to be clear about who is included in each analysis.

4.3.3 Per-Protocol

Another consideration for analysis was that of protocol deviations, i.e. not listening to the CDs. In the complete case analysis all participants were included regardless of adherence to the protocol (the intention-to-treat approach). However a "modified intention-to-treat" or a 'per protocol' approach excludes those participants who did not adequately adhere to the protocol, i.e. those who did not receive a 'defined minimum amount of the intervention'. In this study the defined minimum was taken to be listening to the programme a minimum of 20 times over the 12 week period. This type of analysis is a non-randomised, observational comparison. Numbers for analysis in this manner using completers were very low (n=14) and considered to be too small for useful comparison.

4.3.4 Analytical Procedure Adopted

Accordingly then, analysis was carried out with the existing dataset without imputation for missing follow up data, in accordance with J Bartlett (Bartlett, 2011a) mentioned previously. Therefore the main longitudinal analysis employed a multi-level linear panel design which had the advantage of including all data within the analysis, using the statistical package Stata 13.

Additional analysis was carried out using ANCOVA analysis, with SPSS for cross-sectional data analysis. This type of analysis only included those participants who returned questionnaires at all 4 time points, i.e. completers analysis, and therefore due to the extent of missing data, this resulted in low numbers being analysed, e.g. n = 23, but was adopted to establish the validity of hypothesis 4.

4.4 **Variables**

There were five outcome questionnaires, two of which had subscales, which made a total of ten outcome variables. Table 4:4 Variable Data: Number, missing cases*, central tendencies and distribution at baseline, week 0details key variable data at baseline, week 0. These variables were explored for assumptions of normality, i.e. normal distribution and homogeneity of variance, which is detailed below within the text of each of the individual variable subsections. Other assumptions of parametric tests i.e. independence and interval data were met; i.e. the questionnaires were all at interval level of measurement and as the questionnaires were sent to the participants homes it was assumed that scores were independent of other participants.

As the hypotheses were comparisons of control and intervention (PMT) groups, these subgroups and their properties were also investigated for normality to ascertain the appropriate statistical tests to use.

Table 4:4 Variable Data: Number, missing cases*, central tendencies and distribution at baseline, week 0

Variable	Number	Missing *	Mean [SD]	Median	Mode	Skew	Kurtosis	Range [min-max]
Connor-Davidson Resilience Scale CDRISC10 [CDRISC]	97	3	25.99 [5.56]	26	26	-0.14	0.49	33 [7-40]
Maslach Burnout Inventory: Exhaustion subscale [MBI_EX]	93	7	2.68 [1.47]	2.6	2.6	0.25	-0.86	5.4 [0.2-5.6]
Maslach Burnout Inventory: Personal Efficacy subscale [MBI_PE]	96	4	4.23 [1.0]	4.33	5.17	-0.41	-0.60	4.17 [1.83-6.0]
Maslach Burnout Inventory: Cynicism subscale [MBI_CY]	95	5	1.94 [1.29]	1.8	0.6	0.73	0.16	6 [0-6]
Depression, Anxiety & Stress Scale: Depression subscale [DASS_D]	96	4	9.79 [9.15]	7	2	0.91	-0.16	34 [0-34]
Depression, Anxiety & Stress Scale: Anxiety subscale [DASS_A]	96	3	6.56 [8.37]	4	0	1.62	1.93	32 [0-32]
Depression, Anxiety & Stress Scale: Stress subscale [DASS_S]	96	4	15.54 [9.60]	14	8	1.62	1.93	40 [0-40]
Depression, Anxiety & Stress Scale: Total score [DASS_TOT]	96	5	31.45 [23.76]	24	14	0.53	-0.34	104 [0 - 104]
Warwick Edinburgh Mental Wellbeing Scale [WEMWBS]	96	4	44.83 [8.35]	43.5	40	0.63	0.45	40 [27-67]
Freiburg Mindfulness Inventory [FMI]	97	3	34.7 [7.63]	34	27	0.2	-0.39	35 [19-54]

*Number of baseline cases missing in the database. These were later imputed with the mean, as described in Section 4.4.1

Table 4:5 Control and Intervention (PMT) Groups Outcome Variable Data at baseline, showing number, central tendencies, and distribution data

Variable Group	no	Mean(se)	Median	Range	skew	se	Z	kurtosis	se	Z
CDRISC control	51	25.45(0.79)	26	7-36	-0.51	0.33	-1.52	1.01	0.66	1.53
CDRISC PMT	49	26.55 (.76)	26	17-40	0.35	0.34	1.02	-0.16	0.67	-0.23
MBI_EX control	51	2.97 (.76)	3	0.4-5.6	0.13	0.33	0.38	-0.90	0.66	-1.38
MBI_EX PMT	49	2.37 (.20)	2.6	0.2-5.6	0.44	0.34	1.29	-0.27	0.67	-0.41
MBI_PE control	51	4.16 (.14)	4.16	1.83-.17	-0.23	0.33	-0.69	-0.50	0.66	-0.77
MBI_PE PMT	49	4.30(.13)	4.33	2.17-5.67	-0.63	0.34	-1.86	-0.32	0.67	-0.48
MBI_CY control	51	1.98(.20)	1.8	0-6.0	0.70	0.33	2.09	0.07	0.66	0.11
MBI_CY PMT	49	1.90(.15)	1.94	0.4-5.0	0.73	0.34	2.15	0.18	0.67	0.27
DASS_D control	51	10.93 (1.34)	9.7	0-34	0.80	0.33	2.39	-0.26	0.66	-0.40
DASS_D PMT	49	8.60 (18)	6	8.6-1.17	1.06	0.34	3.11	0.22	0.67	0.33
DASS_A control	51	6.9 (1.11)	4	0-32	1.61	0.33	4.83	2.24	0.66	3.42
DASS_A PMT	49	6.17(1.23)	2	0-32	1.75	0.34	5.13	2.31	0.67	3.46
DASS_S control	51	16.88 (1.32)	16	0-40	0.27	0.33	0.80	-0.47	0.66	-0.72
DASS _S PMT	49	14.14(1.32)	12	0-40	0.88	0.34	2.58	0.52	0.67	0.78
DASS_TOT control	51	34.72(3.30)	31.5	0-104	0.95	0.33	2.85	0.71	0.66	1.08
DASS_TOT PMT	49	28.91(3.31)	20	2-94	1.09	0.34	3.21	0.42	0.67	0.63
WEMWBS control	51	43.76(1.08)	42	27-66	0.47	0.33	1.41	0.63	0.66	0.96
WEMWBS PMT	49	45.95(1.23)	45	32-67	0.74	0.34	2.17	0.46	0.67	0.69
FMI control	51	33.85(1.08)	33	19-52	0.07	0.33	0.22	-0.45	0.66	-0.69
FMI PMT	49	35.57 (1.04)	35	23-54	0.44	0.34	1.29	-0.22	0.67	-0.34

4.4.1 Outliers

Boxplots were plotted for each variable for control and intervention (PMT) group, split by gender, to determine outliers, and these can be seen in the Appendix 2.2. These were checked for obvious mistakes in data entry and none were found. Outliers were identified in several variables (i.e. MBI_EX both groups, MBI_CY PMT group, DASS_D PMT, DASS_A both groups, DASS_TOT PMT and WEMWBS both groups, FMI PMT) and after investigation, it was decided to keep these values in the dataset as their transformation, replacement or removal had little effect on the variable skew or kurtosis.

4.5 Variable Tests of Normality

Tests of normality for all variables, total sample and split according to control or intervention (PMT) group were carried out using the Kolmogorov-Smirnov (K-S) test (see Appendix 2.3) and z scores (Table 4.5 Control and Intervention (PMT) Groups Outcome Variable Data at baseline). Significant results in these normality tests however do not necessarily mean that deviations are sufficient to bias the statistical tests used and these tests are used in conjunction with visual inspection and one's own judgement. Field (2009, p. 139) gives an absolute value of 1.96 above which a z score indicates statistical significant at the $p<0.05$ level, and a z score above 2.58 indicates significance at $p<0.01$ level. Group size was moderately large (51 or 49) and so may account for a small difference becoming significant and where this is the case Field suggests using the 2.58 criteria to determine non normal distribution. It was decided to accept non-normal distribution when *both* the K-S test and z scores indicated a significant difference to normal. Results are tabled, in the Appendix 2.3 and Table 4.5 Control and Intervention (PMT) Groups Outcome Variable Data at baseline, are considered under each variable below.

4.5.1 Connor-Davidson Resilience Scale [CDRISC]

Visual inspection of the histogram, as shown below in Figure 4:4 Histogram of CDRISC scores at baseline, suggested that the data is normally distributed. Analysis of *z* scores from skew and kurtosis statistics supported this (Appendix 2.3).

The mean CDRISC score is 25.99 (SD 5.56) ranging between 7 and 40. This falls within the mean reported by Campbell-Stills of 27.21 (SD 5.84) for a normal student population (Campbell-Sills & Stein, 2007).
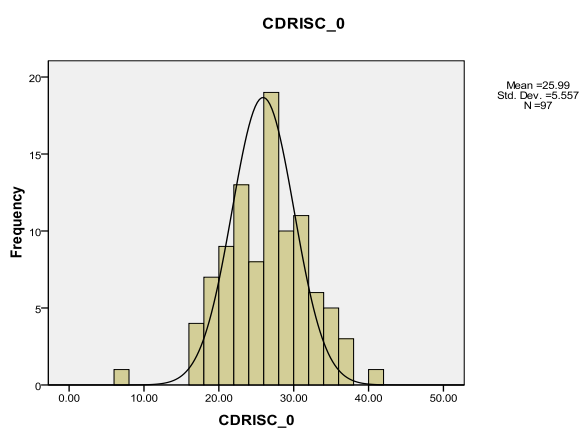
Figure 4:4 Histogram of CDRISC scores at baseline (week 0)

Analysis of the baseline CDRISC scores split by control and intervention group also showed that these groups were normally distributed (see Table 4.4) and analysis by independent t test showed these groups were not significantly different $t(98) = -1.01$, *p*>.05. Levene's test for variance was non-significant, denoting variances were not significantly different between the two groups. Figure 4.5 Histograms of the CDRISC scores, below illustrates the control and intervention group's scores
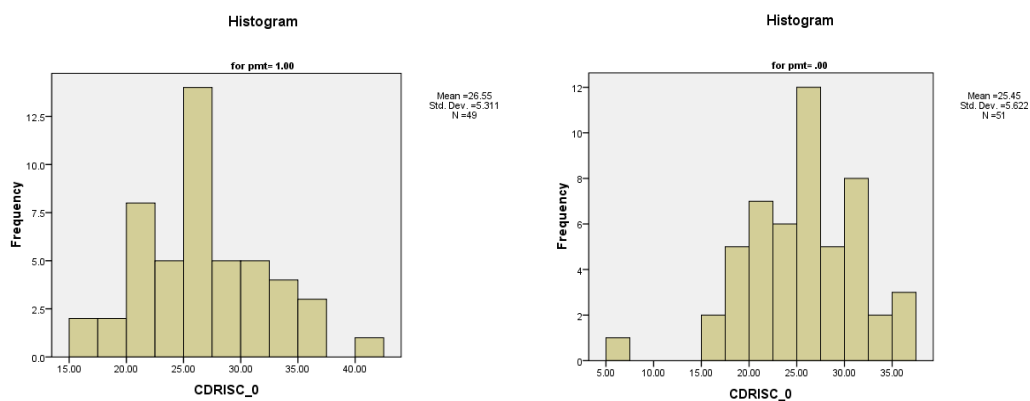
Figure 4:5 Histograms of CDRISC scores; in the control (pmt=0) and intervention (pmt=1) groups.

4.5.2 Maslach Burnout Inventory [MBI]

The Maslach Burnout Inventory consists of 3 subscales: Exhaustion (MBI_EX), Personal Efficacy (MBI_PE) and Cynicism (MBI_CY). The exhaustion and cynicism scales are positively correlated with burnout and the personal efficacy scale is negatively correlated with burnout.

4.5.2.1 Exhaustion scale

Visual inspection of the data at baseline, as shown below in Figure 4:6, perhaps gives some concern as to the distribution of the data, however there was only one mode and analysis of the skew and kurtosis statistic z scores indicated that these were not significantly different to normal distribution.

MBI Exhaustion scores
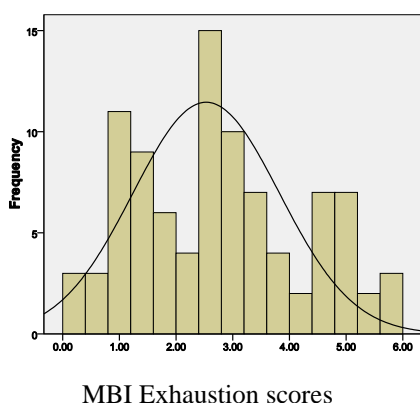
Figure 4:6: Histogram of Maslach Burnout Inventory: Exhaustion Scale scores at baseline (week 0)

The mean, 2.68 (SD 1.47), falls within other population means reported from differing populations which range from 1.28 (SD 1.08) Dutch rural workers to 2.98 (SD 1.38) Canadian nurses. MBI Exhaustion scores have been categorised from North American samples to have an average range of 2.01 – 3.19. (Maslach *et al.*, 1996). Frequency tables showed that 30% of participants fell above the higher value of these average scores (i.e. over 3.20) meaning 30% of study participants had above average exhaustion, slightly higher than other normative samples.

Figure 4:7 Histograms of MBI Exhaustion scores, below, illustrates the distribution of both groups, control and intervention, for this variable.

Control Group MBI Exhaustion Scale

Intervention Group MBI Exhaustion Scale
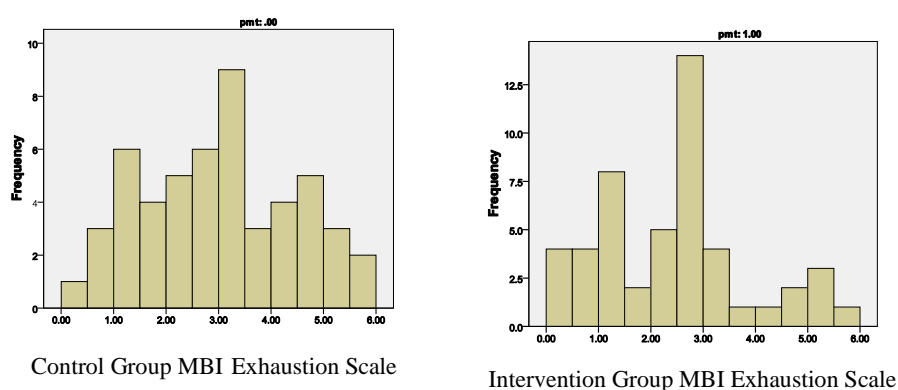
Figure 4:7 Histograms of MBI Exhaustion scores; in the control (pmt=0) and intervention (pmt=1) groups at baseline

Consideration of normality tests indicated normal distribution, (applying a critical z score value of 2.58).

Levene's test for variance was not significant, denoting variances were not significantly difference between the two groups. However comparison on independent means by t test showed there was a significant difference between the groups, $t(98) = 2.14$, $p<.05$ and this was taken into account in analysis by controlling for baseline scores.

4.5.2.2 Personal Efficacy scale

Visual inspection of the data at baseline, shown below Figure 4:8 Histogram of MBI Personal Efficacy scores at baseline, suggests normal distribution, with a slight negative skew. Analysis of the skew statistic indicates that this is not significant, and similarly with the kurtosis statistic.

MBI_PE_0

Mean =4.23
Std. Dev. =0.995
N =96
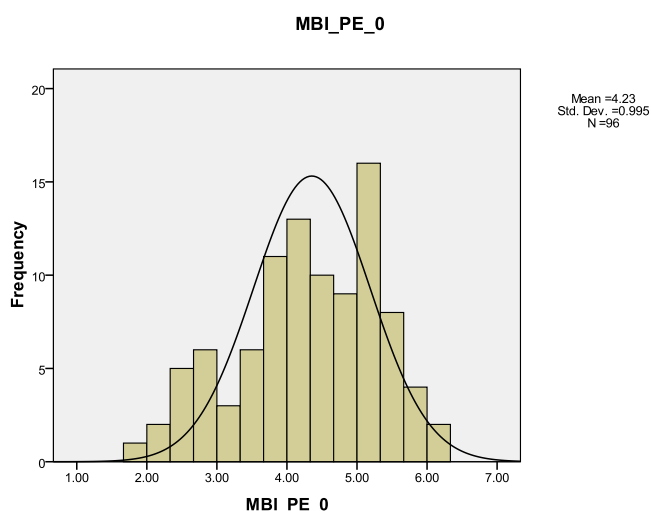
Figure 4:8 Histogram of MBI Personal Efficacy scores at baseline (week 0)

The mean score is 4.23 (SD 0.99). This falls within sample means from other studies from differing populations which range from 4.14 (SD 0.96) in Dutch civil servants to 4.86 (SD 0.94) in Dutch rural workers and an average range of 4.01 – 4.99 from a north American sample (Maslach *et al.*, 1996). Frequency tables showed that 25% of participants fell above the higher end of the average range of a north American sample (over 5.00), meaning our sample is similar to other normative samples.

Analysis of baseline Personal Efficacy scores split by control and intervention group also showed that these groups were normally distributed and comparison of independent means by t test showed there was a no significant difference between the groups, $t(98)= -.73$, $p>.05$. Levene's test for variance was not significant, denoting variances were not significantly difference between the two groups.
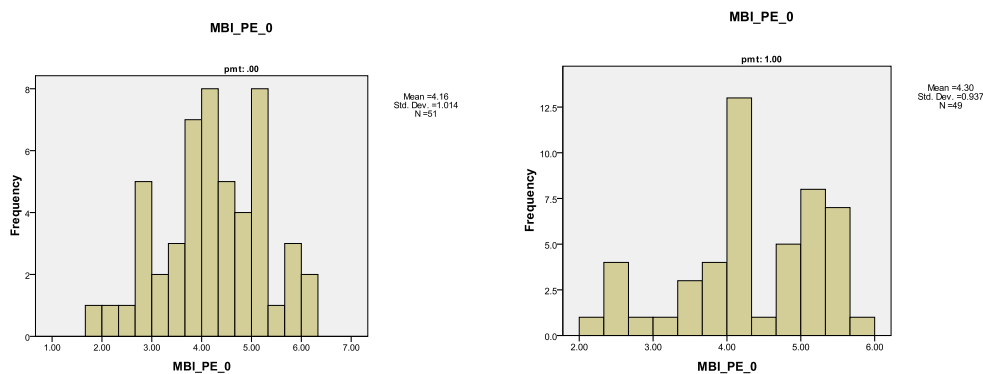
Figure 4:9 Histograms of MBI Personal Efficacy scores in the control (pmt=0) and intervention (pmt=1) groups.

4.5.2.3 Cynicism scale

Visual inspection of the data at baseline, displayed below Figure 4:10 Histogram of MBI Cynicism scores at baseline, suggests normal distribution, with positive skew. Consideration of the kurtosis and skew statistic and the K-S statistic indicated that distribution was normal.
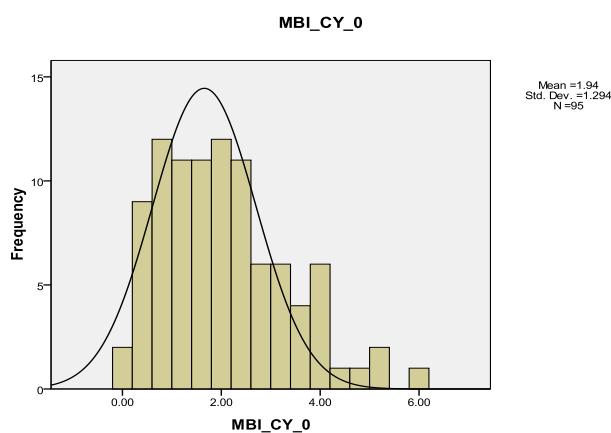
Figure 4:10 Histogram of MBI Cynicism scores at baseline

The mean was 1.94 (SD 1.29) which falls within an average range from a north American sample (1.01 – 2.19) but is higher than other sample means reported, which range from 1.39 (SD 1.02) in Dutch rural workers to 1.92 (SD 1.35) in Canadian clerical workers (Maslach *et al.*, 1996). Frequency distribution showed 36% of participants had higher cynicism levels than the North American normative samples.

Cynicism scores split control and intervention group also indicated the groups were normally distributed. Comparison of group means, by independent t test showed there was a no significant difference between the groups, $t(98) = -.33$, $p>.05$. Levene's test for variance was not significant, denoting variances were not significantly difference between the two groups.
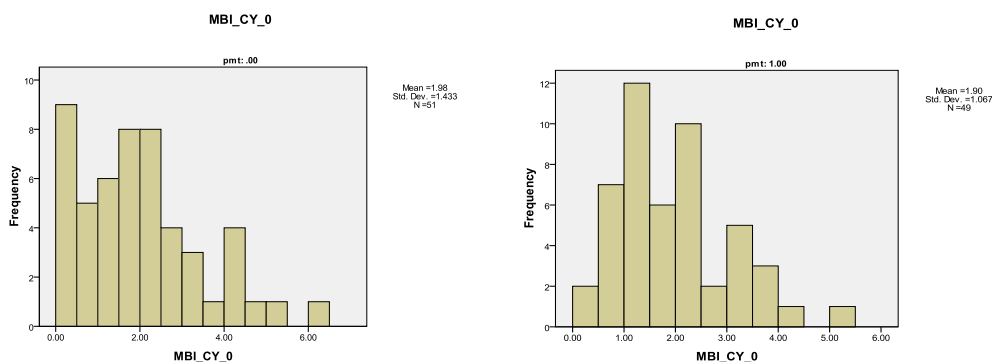
Figure 4:11 Histograms of MBI Cynicism scores in the control (pmt=0) and intervention (pmt=1) groups.

4.5.3 Depression Anxiety and Stress Scale [DASS]

The DASS scale has 3 subscales – Depression [DASS_D], Anxiety [DASS_A] & Stress [DASS_S] and can also be used as a single item overall score [DASS_TOT]

4.5.3.1 DASS Depression subscale [DASS_D]

Visual inspection of the data at baseline, illustrated below in Figure 4.12 Histogram of Depression scores at baseline, suggests strongly positively skewed data which analysis of z score found to be significantly different to normal ($p<.001$). The Kolmogorov-Smirnov test, $D (95) = 0.18$ $p < .001$, (Appendix 2.3) confirmed that the data deviated significantly from a normal distribution.

DASS_D_0
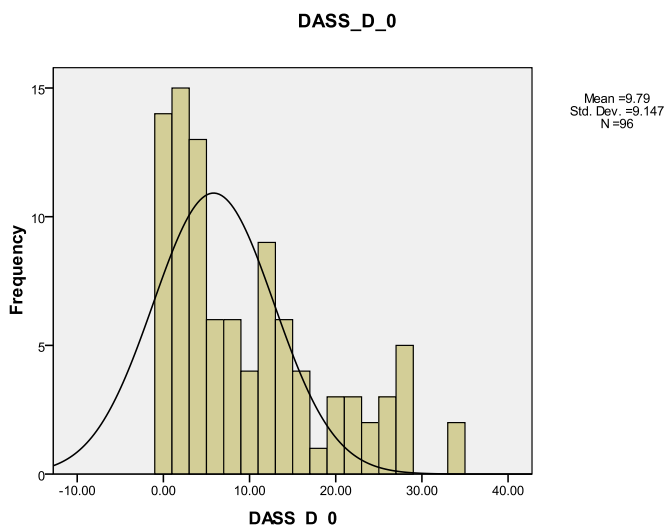
Figure 4:12 Histogram of Depression scores at baseline (week 0)

The mean score was 9.79 (SD 9.15). As the distribution is positively skewed the median may be more helpful and this was 7. These scores lie above values reported by Crawford (Crawford, 2003), of a mean of 5.55 (SD 7.48), and a median of 3 for a general UK adult population. However the values found in this study are more in keeping with those reported by Lovibond for an Australian student population (Lovibond & Lovibond, 1995) of a mean of 6.34 (SD 6.97) and within a normal range for DASS Depression of 0 – 9. DASS Depression scores represent mild depression when 10 – 13, moderate depression if 14 – 20, severe depression when 21- 27 and extremely severe depression for scores 28+.

Frequency distribution showed that 60 % were within the normal range, 24% of our study participants were mild – moderate depressed; and 16% were severely depressed.

Visual inspection of Figure 4.13 Histograms of the DASS Depression intervention (pmt=1) and control (pmt=0) groups are shown below, and it can be seen that the distribution is non-normal. Analysis of these by both the z scores and K-S test confirmed a non-normal distribution for these groups. Transformations (natural log, reciprocal) were explored to correct this but, were not found to produce more normal

distributed data as demonstrated by the K –S test. Non-parametric tests were therefore used with this variable.

Comparison of independent means was carried out by the Mann-Whitney test, a non-parametric test for independent groups, and results showed there was no significant difference between DASS Depression control & intervention groups at baseline, U=1066.00, $z = -1.11$, *ns*.
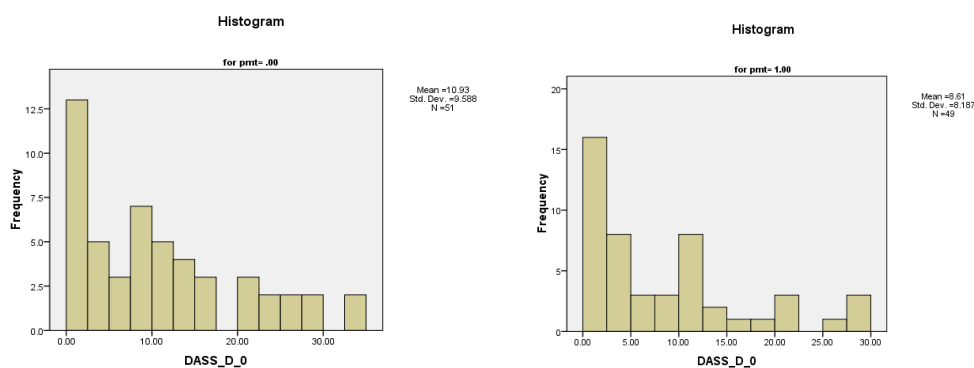
Figure 4:13 Histograms of depression scores; in the control (pmt=0) and intervention (pmt=1) groups.

4.5.3.2 DASS Anxiety subscale [DASS_A]

Visual inspection of the data at baseline, shown in Figure 4.14 Histogram of DASS Anxiety scores at baseline below, suggested strongly positively skewed data, which analysis of the skew data supported (p<.001). The kurtosis statistic was also significantly negatively (*p*<.001). The Kolmogorov-Smirnov test confirmed that the data deviates significantly from normal (Appendix 3.2) - $D(95) = 0.24$, *p*<.001.
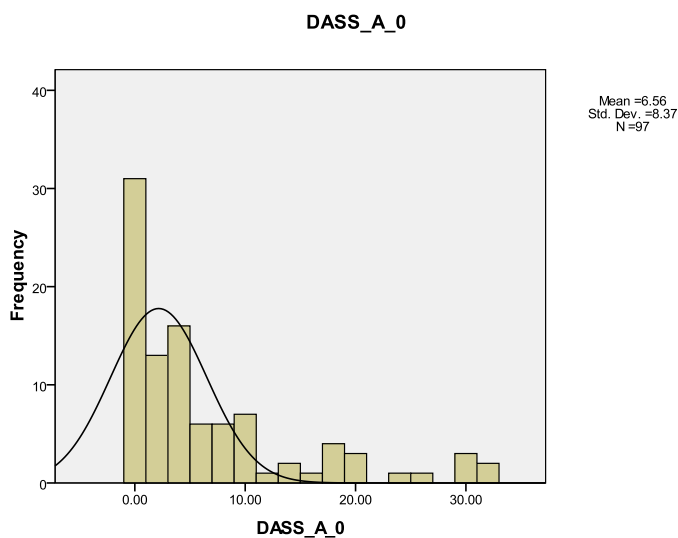
DASS_A_0

Figure 4:14 Histogram of DASS Anxiety scores at baseline (week 0)

The mean DASS anxiety score was 6.56 (SD 8.37). As the distribution is positively skewed the median may be more helpful and this was 4. Similar to the DASS-D above, these are above those values reported by Crawford (Crawford, 2003) of a mean of 3.56 (SD 5.39), and a median of 2 for a general UK adult population. The values in this study are more similar to those reported by Lovibond for an Australian student population (Lovibond and Lovibond, 1995) of a mean DASS Anxiety of 4.70 (SD 4.91) and a normal range for DASS Anxiety is 0 – 7, mild anxiety 8 - 9, moderate anxiety 10 - 14 , severe anxiety 15 - 19 and extremely severe anxiety 20+.

Frequency distribution showed that 74 % were within the normal range, 11% were mild – moderate anxious and 15% were severely anxious.

Visual inspection of Figure 4.15 Histograms of the DASS Anxiety PMT and control groups, are shown below and it can be seen that the distribution is non-normal. Analysis of these by both the z scores and K-S test, confirmed a non-normal distribution for these groups.

Transformations (natural log, reciprocal) were explored to correct this but, were not found to produce more normal distributed data as demonstrated by the K –S. Non-parametric tests were therefore used with this variable.

Comparison of independent means was carried out by the Mann-Whitney test, a non-parametric test for independent groups, and results showed there was no significant difference between DASS Anxiety control & intervention groups at baseline, U=1051.00, $z = -1.23$, *ns*.
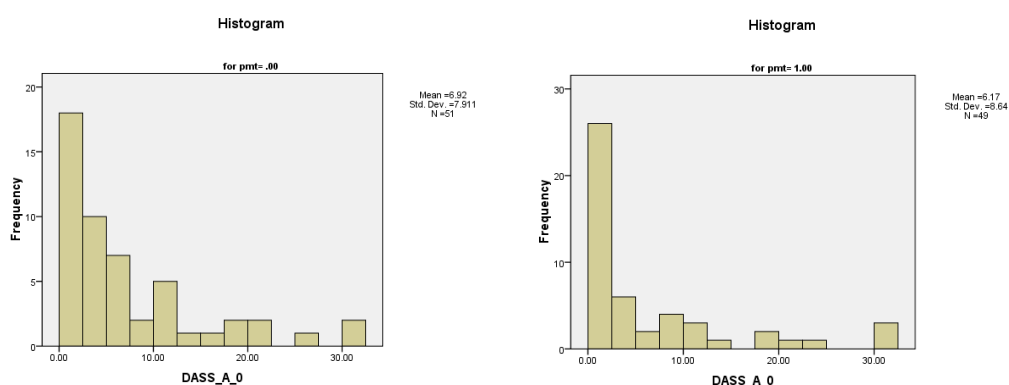
Figure 4:15 Histograms of DASS Anxiety control (pmt=0) and intervention (pmt=1) group scores at baseline (week 0), illustrating their non-normal distribution

4.5.3.3 DASS Stress subscale [DASS_S]

Visual inspection of the data at baseline, as shown in Figure 4:16 Histogram of Stress (DASS_S) scores at week 0 below, suggested a bimodal distribution. The skew statistic is significantly non normal ($p<.01$). The Kolmogorov-Smirnov test confirmed that the data deviated significantly from normal, $D(95) = 0.13$, $p<.001$.
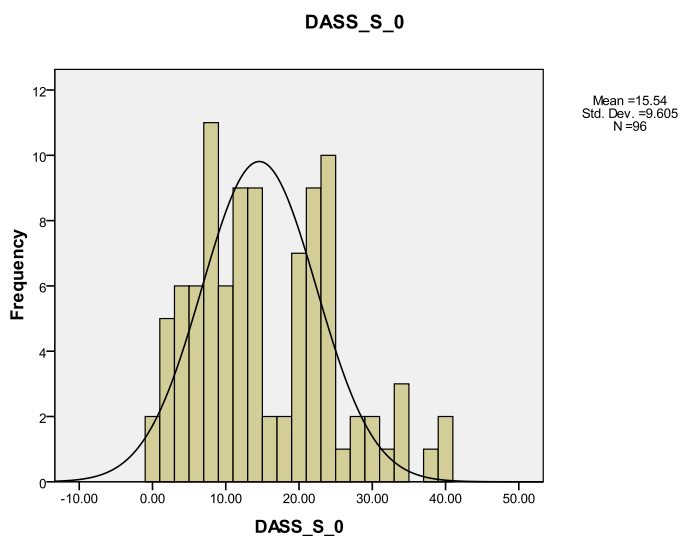
Figure 4:16 Histogram of Stress (DASS_S) scores at week 0

The mean was 15.54 (SD 9.60). Similarly with the other DASS subscales this is above the values reported by Crawford (Crawford, 2003) of a mean of 9.27 (SD 8.04), for a general UK adult population and more in keeping with the Lovibond Australian student population (Lovibond & Lovibond, 1995) reported values of a mean DASS Stress of 10.11 (SD 7.91) and a normal range for DASS Stress is 0 – 14, mild stress 15 - 18, moderate stress 19 - 25 , severe stress 26 - 33 and extremely severe stress 34+. Frequency distribution showed that 56.3 % of our study participants were within the normal stress range, 32.2% were mild – moderate stressed, and 11.5% were severely stressed.

Histograms of the DASS Stress intervention and control groups are shown below in Figure 4:17. Analysis of these by both the z scores and K-S test, confirmed a non-normal distribution for the intervention group. Transformations (natural log, reciprocal) were explored to correct this but, were not found to produce more normal distributed data as demonstrated by the K –S test. Non-parametric tests were therefore used with this variable for baseline analysis.

Comparison of independent means was carried out by the Mann-Whitney test, a non-parametric test for independent groups, and results showed there was no significant

difference between DASS Stress control & intervention groups at baseline, *U*=998.00, *z* = -1.59, *ns*.
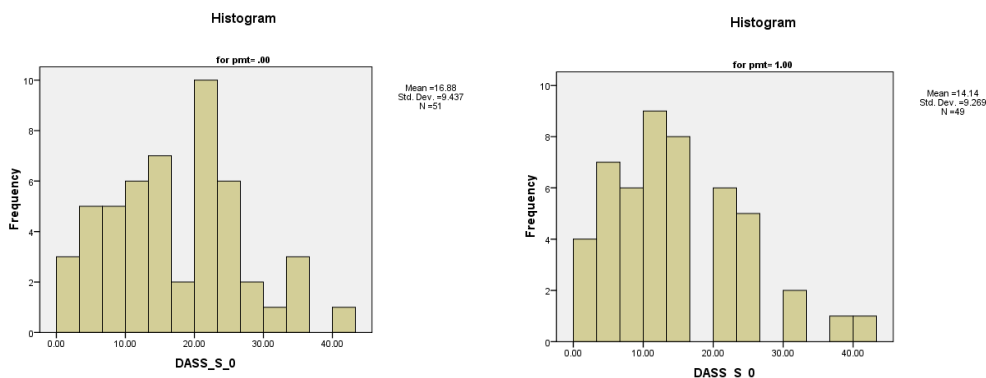
Figure 4:17 Histograms of DASS Stress control (pmt=0) and intervention (pmt=1) group scores at baseline (week 0) illustrating their non-normal distribution

4.5.3.4 DASS Total Score [DASS_TOT]

Visual inspection of Figure 4:18 Histogram of DASS total scores at week suggests a normal distribution with a slight positive skew. Analysis of the skew and kurtosis statistic showed that the skew statistic is significantly non normal (*p*<.001). The Kolmogorov-Smirnov test confirmed that the data deviated significantly from normal, *D*(95) = 0.18, *p*<.001.
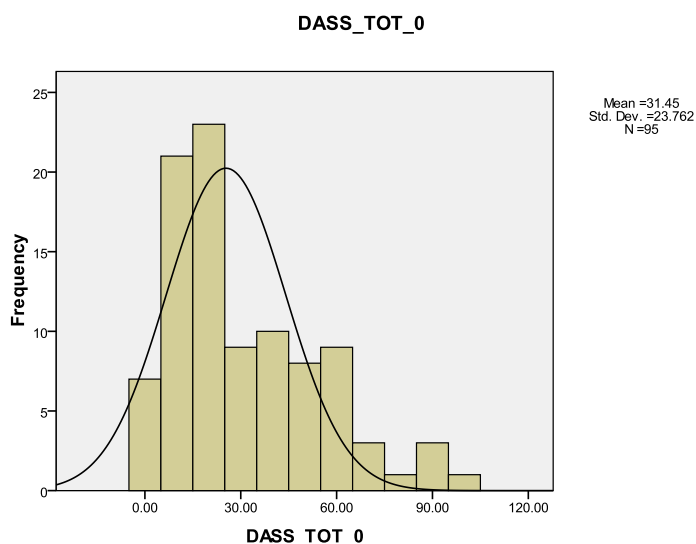
Figure 4:18 Histogram of DASS total scores at week 0

The mean was 31.45 (SD 23.76). As would be expected from the subscale scores this fell above the Crawford (Crawford, 2003) scores (mean of 18.38 (SD 18.82)), for a general UK adult population. The Lovibond (Lovibond & Lovibond, 1995) reported mean for an Australian student population for total DASS was 21.15 (SD 19.79). This current study's DASS total mean and the frequency distribution showed that 59% of participant scores were above the Lovibond reported mean.

Visual inspection of Figure 4:19 Histograms of DASS total control and intervention group scores at baseline (week 0), is shown below, and it can be seen that the distribution is non-normal. Analysis of these by both the z scores and K-S test, confirmed a non-normal distribution for both these groups. Transformations (natural log, reciprocal) were explored to correct this but were not found to produce more normal distributed data as demonstrated by the K –S test. Non-parametric tests were therefore used with this variable.

Comparison of independent means was carried out by the Mann-Whitney test, a non-parametric test for independent groups, and results showed there was no significant difference between DASS_TOT control & PMT groups at baseline, U=980.00, $z = -1.71$, *ns*.
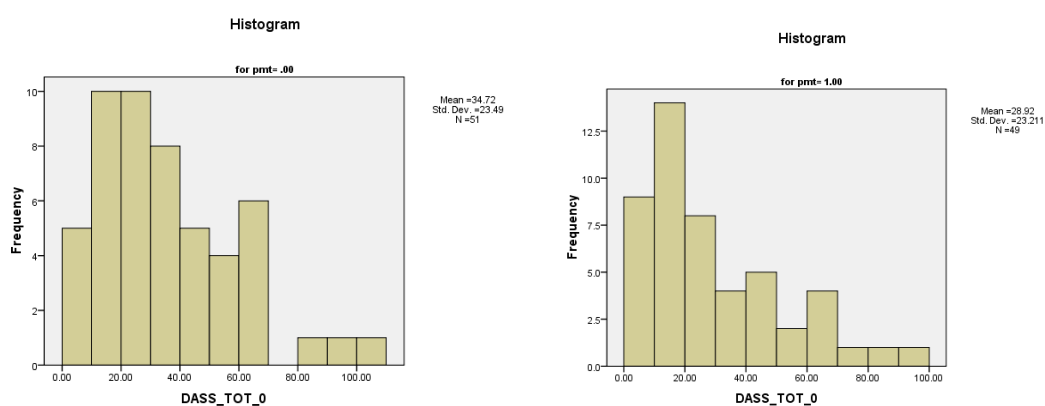
Figure 4:19 Histograms of DASS total control (pmt=0) and intervention (pmt=1) group scores at baseline (week 0), illustrating their non-normal distribution

4.5.4 Warwick and Edinburgh Mental Wellbeing Scale [WEMWBS]

Visual inspection of the data at baseline suggests a normal distribution, as shown in Figure 4:20 Histogram of WEMWBS scores at baseline, below. The Kolmogorov-Smirnov test indicated that the data deviated significantly from a normal distribution, $D(96) = 0.10$, $p<.05$. However, the skew statistic was only significant at the $p<.05$ level.
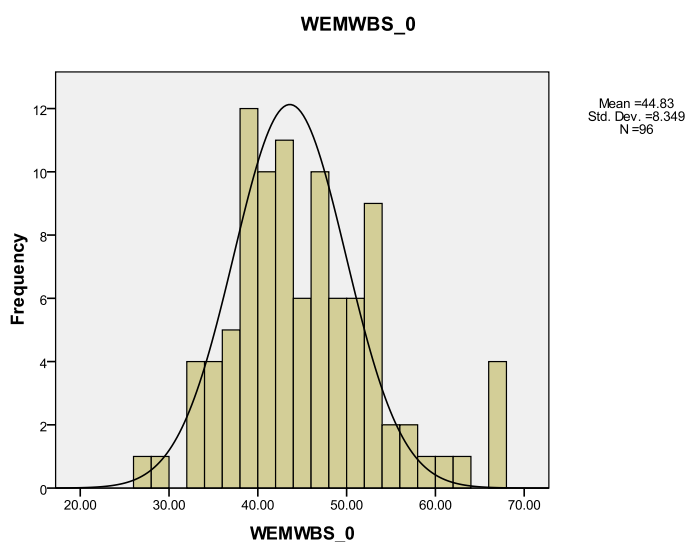
Figure 4:20 Histogram of WEMWBS scores at baseline, week=0

The mean score was 44.83 (SD 8.35) (95% CI 43.1) which falls within the reported population mean for WEMWBS of 51 (95% CI 51 – 52) (Tennant *et al.* 2007), although a lower overall mean suggesting our study population had lower levels of wellbeing than the population norm.

Visual inspection of Figure 4:21 Histograms of wellbeing control and intervention group scores at baseline, is shown below and it can be seen that the distribution looks fairly normal. Analysis of these by both the z scores and K-S test suggested a normal distribution.

Comparison of independent means by t test showed there was a no significant difference between the groups, $t(98) =-.1.35$, $p>.05$.
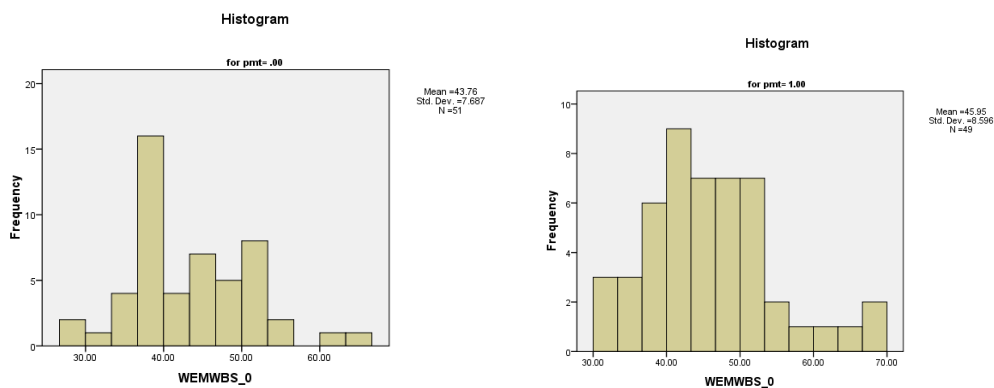
Figure 4:21 Histograms of wellbeing control (pmt=0) and intervention (pmt=1) group scores at baseline (week 0)

4.5.5 Freiburg Mindfulness Inventory [FMI]

Distribution, as shown in Figure 4.22 Histogram of FMI scores at baseline below, was found to be normal as can be seen from the z scores of the skew and kurtosis statistics and the Kolmogorov-Smirnov test confirmed that the data did not deviates significantly from a normal distribution, $D(97)= 0.06$, $p>.05$
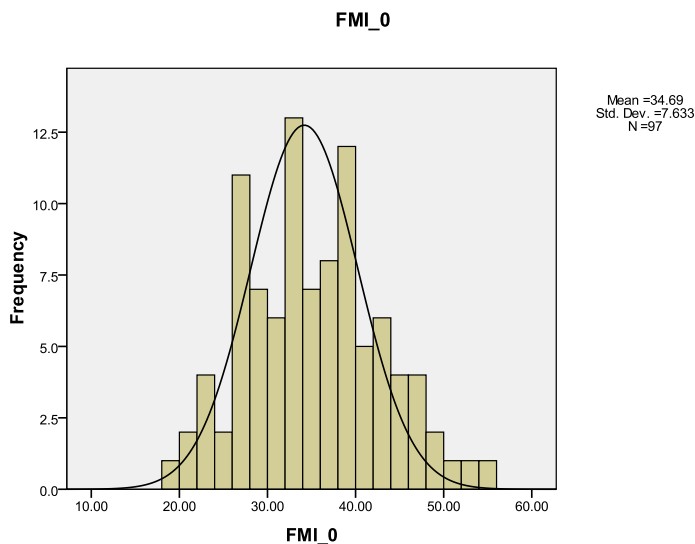
Figure 4:22 Histogram of FMI scores at baseline, week=0

The mean score for the FMI was 34.69 (SD 7.63) which falls within the mean range for a normal population as reported by Walach *et al.*(2006) of 37.24 (SD 5.63).

Visual inspection of Figure 4:23 Histogram of FMI control and intervention group scores at baseline, is shown below and it can be seen that the distribution appears normal. Analysis of these by both the z scores and K-S test confirmed normal distributions Comparison of independent means by t test showed there was a no significant difference between the groups, *t*(98) =-.1.14, *p*>.05.
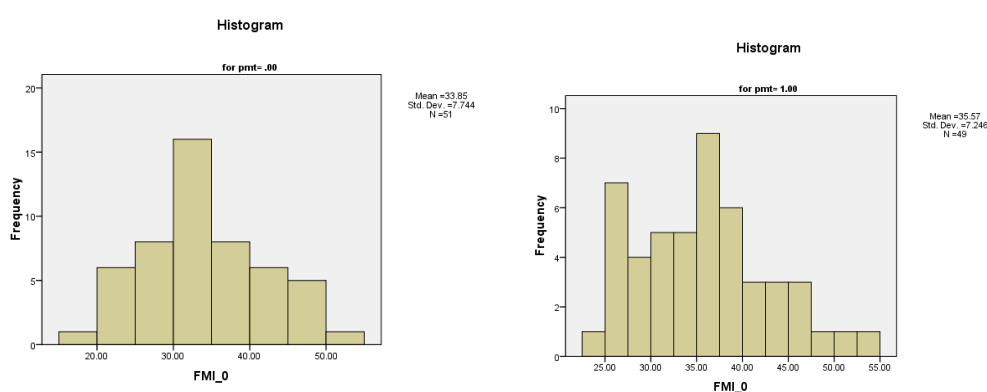
Figure 4:23 Histogram of FMI control (pmt=0) and intervention (pmt=1) group scores at baseline (week 0)

4.5.6 Summary Comparison of Variables at baseline

Normality testing was undertaken on each variable, with the whole sample and when split by intervention and control group. These tests showed that all variables - resilience (CDRISC), Maslach Burnout Exhaustion (MBI_EX), Cynicism (MBI_CY), Personal Efficacy (MBI_PE), wellbeing (WEMWBS) and mindfulness (FMI) were normally distributed. The DASS variables - depression (DASS_D), anxiety (DASS_A), stress (DASS_S), and DASS total score (DASS_TOT) showed non-normal distribution. Transformations were performed with the DASS variables but this did not give normally distributed data. Therefore non-parametric tests were used for the DASS variables.

The participants had been randomly assigned to either the intervention or control group and therefore no statistical difference, between the groups, was expected. This was confirmed by comparison of means by the appropriate statistical test; i.e. independent t tests, for the normally distributed groups and Mann-Whitney test for non-normally distributed group, and with the exception of the Exhaustion (MBI_EX) variable, there was found to be no significant difference between the control and PMT group at baseline.

4.5.7 Normality Tests across time

Normality tests were carried out with the variables for control and intervention groups at each time point. These results are shown in Appendix 2.4 and confirm the normal distribution of all variables at all other time points, with the exception of three of the DASS variables (depression (DASS_D); anxiety (DASS_A; total DASS score (DASS_TOT)). These DASS variables continued to be significantly different to normal and therefore non-parametric tests are appropriate for these variables. The stress (DASS_S) variable normality tests showed this variable to be normally distributed in both the control and intervention groups at week 4, 12 and 26. Therefore it was considered appropriate to use parametric tests for DASS_S.

4.6 Engagement with the Conditions

To gauge individual engagement with the conditions, participants were asked to the record the number of times they listened to each track, in a listening diary. This information was collated to form a new independent variable, which therefore represented the total number of times a participant had recorded listening to tracks on CD1, CD2 and CD3 over the 12 week listening period.

There are a number of limitations with this method of assessing engagement, over and above the fact that not all participants recorded listening information. Self-reported behaviour by diary has been criticised as being subject to retrospection, and as such

may be reflect bias or even falsification and therefore not represent an accurate record of the event (Stone *et al.* 2002). Indeed completing diary reports by retrospectively filling in the details (known as hoarding) was found to occur in two-thirds of cases in one study (Gable, Reis, & Elliot, 2000, Study 2). However although it has been suggested that electronic diary recording may be more accurate, comparison of paper and electronic diaries has shown equivalent results (Green *et al* 2006). Therefore results of engagement should be viewed within these limitations although it is thought that biases in recording are likely to be the same in each group.

Table 4:6 Number of participants in both groups who recorded listening times, below details the number of participants who completed and returned the listening diary for each of the 3 CDs.

Table 4:6 Number of participants in both groups who recorded listening times

	Group	Recorded		Missing		Total
		N	Percent	N	Percent	N
Recording listening CD1	control	32	62.70%	19	37.30%	51
	PMT	29	59.20%	20	40.80%	49
Recording listening CD2	control	23	45.10%	28	54.90%	51
	PMT	22	44.90%	27	55.10%	49
Recording listening CD3	control	19	37.30%	32	62.70%	51
	PMT	20	40.80%	29	59.20%	49

Normality tests were carried out (Appendix 2.5) and this variable was found to be significantly different to normal distribution in both the control and intervention groups, $D (33) = 0.26$, $p < .05$, $D (30) – 0.36$, $p < .05$, respectively.

The population pyramids below, Figure 4:24 Diagram illustrating the gender difference in engagement with the programme, illustrates the differing distribution of listening by gender. It can be seen that a much greater proportion of women did not listen at all, or listened only a few times, and analysis revealed that this difference was significant, $U = 593.5$, $z = 2.63$, $p < .01$, $r = .33$.

These results suggests that women find it harder to engage with this type of programme.
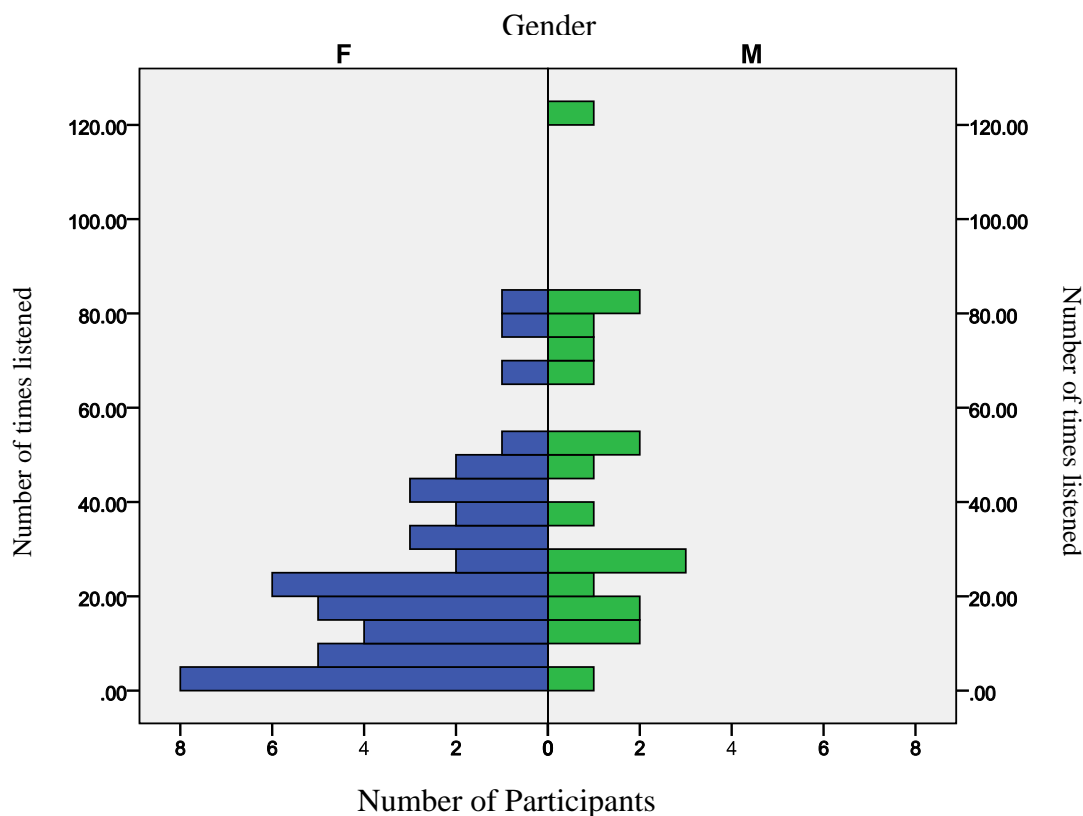
Figure 4:24 Diagram illustrating the gender difference in engagement with the programme

Analysis, by a Mann-Whitney test, of gender by condition revealed that there was no significant difference between the control and intervention group in gender distribution and listening, $U=438.5$, $z=-.778$, $p>.05$, $r=.09$. This indicated that the differential pattern of listening in men and women was unaffected by allocation to group. The table below, Table 4:7 Listening by gender & group showing mean, confidence intervals and median, displays means and medians.

Table 4:7 Listening by gender & group showing mean, confidence intervals and median

group	Women			Men		
	No of times listened			No of times listened		
	mean	CI	Median	mean	CI	Median
Control	25.14	14.37-35.91	19	47.41	25.77-69.05	40
intervention	22.26	14.63-29.89	20	40.14	13.24-67.04	27

4.7 **Hypothesis Testing**

The table below Table 4:8: Variable Means for PMT & Control at each time point, summarises the outcome data for each variable for the control group (CG) and the intervention group (PMT).

Table 4:8: Variable Means, & Standard Deviations, for PMT & Control (CG) at each time point, reflecting the numbers used in ANCOVA analysis (excluding cases listwise count).

Measure	group	N	time 0 M	SD	time 1 M	SD	Time 2 M	SD	time 3 M	SD
Wellbeing	CG	17	42.93	7.46	45.35	8.41	46.94	6.89	45.76	8.37
	PMT	16	44.88	7.85	48.56	7.96	53.44	7.83	48.19	8.73
Mindfulness	CG	17	34.33	7.30	35.82	8.15	38.88	7.44	36.71	8.21
	PMT	16	34.06	5.89	36.13	6.72	39.5	7.92	39.88	7.64
Resilience	CG	17	25.89	4.07	26.89	4.23	26.06	4.90	26.33	6.01
	PMT	16	26.38	4.96	26.69	4.59	28.31	4.81	27.19	4.70
Depression	CG	17	10.93	9.59	8.98	7.19	6.67	7.21	6.86	6.05
	PMT	16	8.61	8.19	7.67	6.94	4.92	5.78	6.26	6.55
Anxiety	CG	17	6.92	7.91	4.23	6.13	3.78	5.80	3.79	5.56
	PMT	16	6.17	8.64	5.58	8.40	4.00	7.17	3.81	5.30
Stress	CG	17	16.88	9.44	13.08	7.66	11.33	9.08	10.89	7.59
	PMT	16	14.14	9.27	11.83	8.96	10.96	8.54	9.61	7.53
Total DASS	CG	17	34.72	23.49	26.8	18.26	21.78	20.21	21.78	17.51
	PMT	16	28.92	23.21	25.08	21.52	20.00	18.11	19.68	15.82
Exhaustion	CG	18	2.92	1.14	2.49	1.20	2.51	1.27	2.28	1.20
	PMT	16	2.56	1.36	2.31	1.72	2.27	1.46	2.50	1.55
Cynicism	CG	18	1.87	1.25	1.90	1.03	1.94	1.20	1.52	1.00
	PMT	16	1.83	1.24	2.07	1.43	1.89	1.50	2.04	1.30
Efficacy	CG	18	4.12	1.07	4.41	1.04	4.30	0.99	4.42	1.20
	PMT	16	4.12	0.85	4.10	0.92	4.48	0.96	4.33	1.04

4.8　**Hypothesis 1**

Positive Mental Training will improve wellbeing, resilience and mindfulness, relative to controls where:

> 1.　*Wellbeing will be measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS);*

> 2.　*Resilience will be measured using the Connor-Davidson Resilience Scale 10 (CD-RISC 10) and*

> 3.　*Mindfulness will be measured using the Freiburg Mindfulness Inventory (FMI).*

To test this hypothesis it was decided to adopt a mixed model, multi-level linear approach – a hierarchical linear model. This type of analytic design is appropriate for longitudinal data and has a number of advantages over the traditional repeated measure design in SPSS (Field 2009; Gayle 2013). Due to the high % of missing data, it was acknowledged that a limitation of SPSS repeated measure design was that it could only analysis those participants who had a complete set of data at each time point. With a panel design, known as 'long format', in which each time point is given a row (as opposed to a column) it is possible to analyse all data.

This type of model can also take account of uneven spacing of repeated measures, unlike the repeated measure option in SPSS and also accounts for biases in correlation through building in assumption of correlation within an individual's questionnaire scores over time. Additionally this framework controls for variables that cannot be observed, such as differences in offices/ worksites, and variables that change within an individual over time, i.e. it accounts for individual heterogeneity. As a mixed model, it incorporated both fixed (observed) effects, and random (unobserved) effects which allows for individual variability and also any effect of hierarchy in the data. In this study's data, participants were in different offices and this may have influenced the participants' responses in some unforeseen way. A purely fixed effects approach does

not take account of time constant variables, i.e. variables that do not change with time, which in this study were gender, group, age, place of work and full- time or part-time work (hours of work). Time and listening were added into the model as a time variant predictors of the outcome variable.

Stata 13 was used to run a random effects maximum likelihood regression model, with the outcome variable as defined by hypothesis e.g. wellbeing, and with time and listening as the fixed effect predictors, and gender, group, age, place of work, and hours of work as random effect time invariant variables. As a random effect model unobserved effects of the individual and of the fixed effects were also factored in, along with the residual, and unobserved error of this.

To check that it was appropriate to carry out a random effects model, both a fixed effects and random effects model were carried out and tested for model appropriateness with a Hausman's test; results indicated that random effects was appropriate as the test was non-significant, $\chi^2 (1) = 0.10$, $p = 0.753$, *ns.*

4.8.1 Wellbeing

Results showed that 62 participants with 200 observations were analysed. The average number of times participants completed the questionnaire pack was 3 ranging from 1 – 4.

The model reported in Table 4.9 Results of Random Effects Regression of Wellbeing, was significant[1], $\chi^2 (17) = 36.77$, $p<.01$. The table below displays the results and it can be seen that group significantly influences wellbeing, $p<.05$, indicating that the intervention significantly influenced wellbeing, compared to the control. The effect of time was also significant, $p<.00$ as was age $p<.05$ and one of the workplaces, $p<.01$

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[1] I.e. the data sufficiently fitted the model so that individual results can be reliably differentiated from a null model.

Table 4:9 Results of Random Effects Regression of Wellbeing, with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors

Wellbeing	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	1.24	0.32	3.92	0.00	0.62	1.86
Group	3.14	1.55	2.03	0.04	0.10	6.18
Listening	0.04	0.02	1.14	0.25	-0.03	3.29
Work	-1.38	2.39	-0.58	0.56	-6.06	3.29
Gender	1.99	1.86	1.07	0.28	-1.65	5.63
Age	0.17	0.08	2.03	0.04	0.01	0.32
Place						
1	6.45	5.67	1.14	0.26	-4.67	17.56
2	-0.57	5.41	-0.11	0.92	-11.18	10.04
3	-2.26	3.97	-0.57	0.57	-10.03	5.52
4	7.96	3.04	2.62	0.01	2.01	13.92
5	4.82	3.46	1.39	0.16	-1.97	11.60
6	-4.28	4.28	-1.00	0.32	-12.67	4.11
7	-1.40	2.70	-0.52	0.61	-6.69	3.90
8	2.56	2.25	1.14	0.25	-1.84	6.96
9	-7.57	6.11	-1.24	0.23	-19.53	4.40
11	10.26	6.05	1.7	0.09	-1.59	22.11
12	-6.84	6.56	-1.04	0.30	-19.70	6.02

The graph below Figure 4:25 Wellbeing levels at each time point in the control and intervention groups, illustrates the change of wellbeing levels across time in both groups and this, considered with the ANCOVA analysis reported in Section 4.11 [2], suggests that wellbeing in the intervention group increased to time point 3 (12 weeks) which was the end of the audio programme, and a point in time when participants had to return the programme. There was a significant difference between the groups at this stage. Following this, wellbeing levels decreased in the intervention group to point 4, (26 weeks) to become similar to the control group again.

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[2] Cross-sectional analyses are referred to, along with the longitudinal analysis, prior to their full reporting in Section 4.11, to help put the regression analysis in context.

Figure 4:25 Wellbeing levels at each time point in the control and intervention groups

4.8.2 Mindfulness

Results showed that 62 participants with 195 observations were analysed. The average number of times participants completed the questionnaire packs was 3 ranging from 1 – 4.

The model reported in Table 4.10 Table Random Effects Regression of Mindfulness, was significant, χ^2 (17) = 36.59, p<.01. Results are shown below and it can be seen that mindfulness increased with time, (p<.00) but group (p = 0.53, ns) did not have any significant effect on this.

Table 4:10 Results of Random Effects Regression of Mindfulness with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors.

Mindfulness	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	1.53	0.28	5.50	0.00	0.96	2.07
Group	-1.05	1.67	-0.63	0.53	-4.32	2.23
Listening	0.01	0.35	0.17	0.86	-0.06	0.07
Work	2.87	2.55	1.13	0.26	-2.13	7.86
Gender	0.42	2.01	0.21	0.83	-3.51	4.36
Age	-0.01	0.09	-0.16	0.88	-0.19	0.16
Place						
1	-1.11	6.09	-0.02	1.00	-12.04	11.83
2	-5.04	5.88	-0.86	0.39	-16.57	6.49
3	-1.92	4.14	-0.46	0.64	-10.04	6.21
4	4.18	3.26	1.28	0.20	-2.21	10.57
5	1.36	3.71	0.37	0.71	-5.92	8.64
6	-3.77	4.58	-0.82	0.40	-12.75	5.22
7	0.63	2.88	0.22	0.83	-5.01	6.28
8	2.00	2.43	0.82	0.41	-2.76	6.75
9	1.31	6.45	0.20	0.84	-11.32	13.95
11	4.64	6.38	0.73	0.47	-7.87	17.14
12	3.88	6.94	0.56	0.58	-9.72	17.48

A graph of mindfulness at each time point is shown below in Figure 4:26 Mindfulness levels at each time point in the control and intervention groups. ANCOVA analysis of each time point, is reported later in Section 4.11 which shows a small effect size difference between the groups at 12 weeks and a medium effect size difference between the groups at 26 weeks, when listening was controlled for.
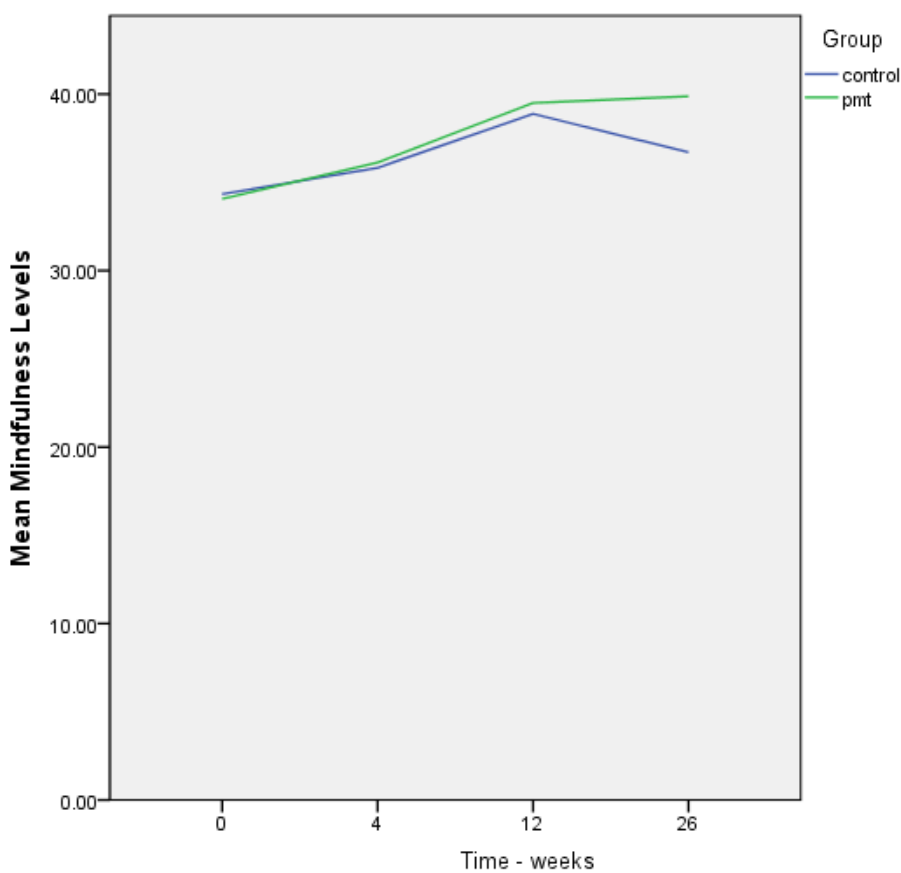
Figure 4:26 Mindfulness levels at each time point in the control and intervention groups

4.8.3 Resilience

Results showed that 62 participants with 197 observations were analysed. The average number of times participants completed the questionnaire packs was 3 ranging from 1 – 4.

The random effects regression model (with time, group (PMT), listening, work (part time/ full time), gender, age and place of work as predictors of resilience) model was not significant, χ^2 (17) = 21.21, *p=0.22, ns* and therefore individual results were not reliable and could not be differentiated from a null model.

The graph below, Figure 4:27 Resilience levels at each time point in the control and intervention groups illustrates resilience levels at each time point in both the control and intervention group. ANCOVA analysis of the individual time points is reported in Section 4.11 and shows no significant difference between the groups at each time point.
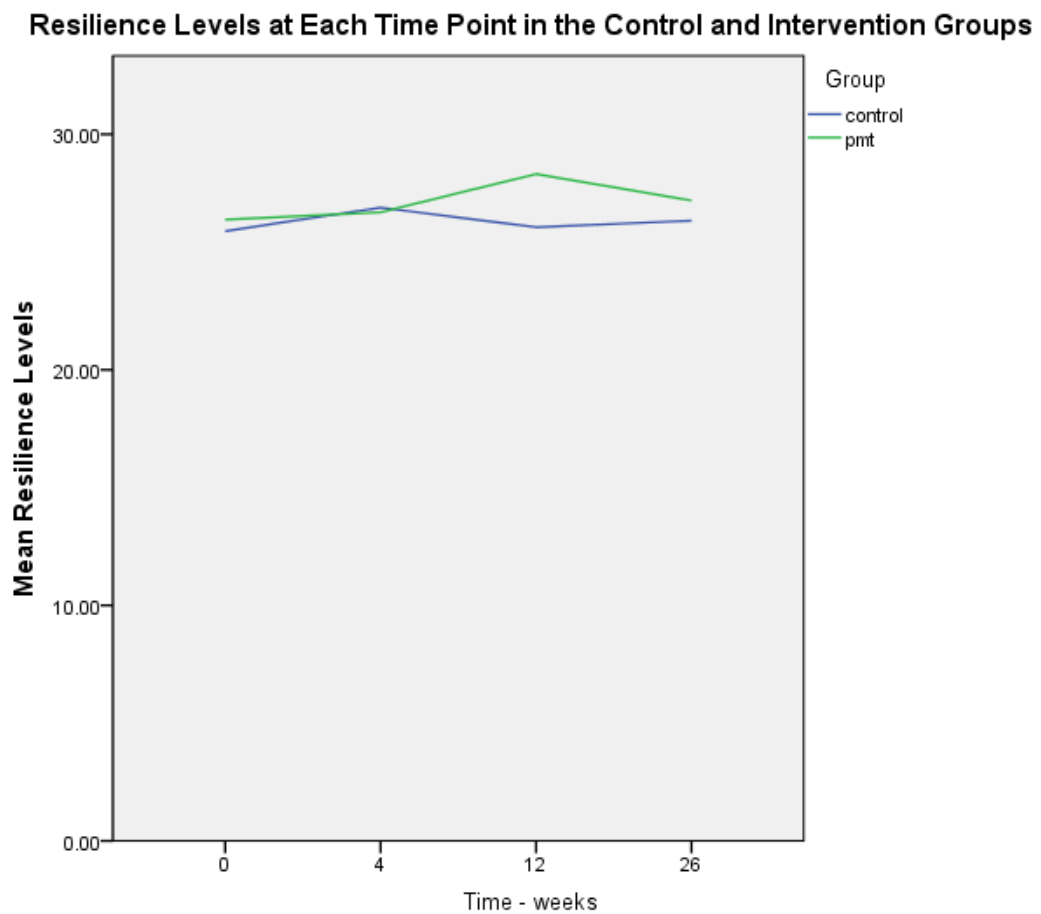
Figure 4:27 Resilience levels at each time point in the control and intervention groups

4.9 Hypothesis 2

Positive Mental Training will improve mental health and reduce burnout, relative to controls, where:

> 1. *Mental health will be measured by the DASS:*
> 2. *Burnout will be measured by the Maslach Burnout Inventory (MBI).*

Analytic process was similar to that employed for hypothesis 1, where random effects regressions were carried out for each variable. The results are shown in the tables and graphs below, first in the Depression, Anxiety, Stress and DASS total score variables and then in the Maslach Burnout Inventory variables – Exhaustion, Cynicism and Personal Efficacy.

4.9.1 Depression

Results showed that 62 participants with 195 observations were analysed. The average number of times participants completed the questionnaire packs was 3 ranging from 1 – 4.

The random effects model, as described in Table 4.11 Random Effects Regression of Depression with Time, was significant, χ^2 (17) = 34.33, $p<.01$. Results are shown below and it can be seen that depression scores significantly decreased with time, ($p<.00$) and the PMT group had a significant effect ($p <.05$). Age and a workplace were also significant predictors of depression ($p<.01$ and $p<.00$, respectively).

Table 4:11 Random Effects Regression of Depression with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors.

Depression	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	-1.04	0.32	-3.22	0.00	-1.67	-0.41
Group	-4.09	1.65	-2.48	0.01	-7.32	-0.86
Listening	-0.05	0.03	-1.46	0.15	-0.12	0.02
Work	1.52	2.53	0.60	0.55	-3.44	6.47
Gender	-0.25	1.97	0.77	0.44	-2.35	5.38
Age	-0.25	0.09	-2.82	0.01	-0.42	-0.07
Place						
1	-2.23	6.02	-0.37	0.71	-14.02	9.57
2	-4.45	5.76	-0.77	0.44	-15.74	6.84
3	4.98	4.19	1.19	0.24	-3.23	13.18
4	-0.31	3.23	-0.10	0.92	-6.64	6.02
5	1.37	3.78	0.36	0.72	-6.04	8.79
6	3.45	4.54	0.76	0.45	-5.45	12.34
7	3.55	2.86	1.24	0.22	-2.06	9.16
8	-2.40	2.39	-1.00	0.32	-7.10	2.29
9	10.06	6.45	1.56	0.12	-2.59	22.71
11	-9.70	6.39	-1.52	0.13	-22.23	2.83
12	19.17	6.94	2.76	0.01	5.56	32.78

The graph below, Figure 4:28 Depression Levels at Each Time Point in the Control and Intervention Groups, illustrates depression levels at each time point in both the control and intervention group. Analysis of the individual time points is reported in Section 4.11.3 and shows a small effect size for the difference between the groups at time 2 (12 weeks).
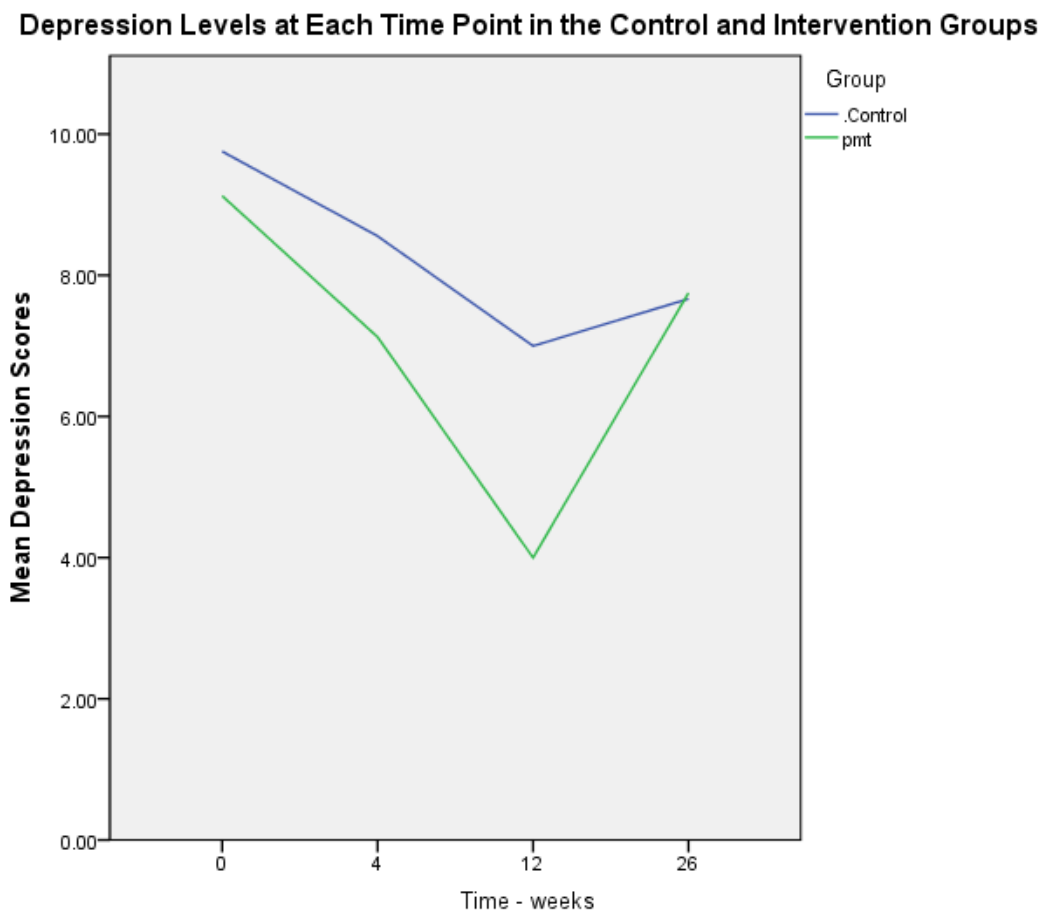
Figure 4:28 Depression Levels at Each Time Point in the Control and Intervention Groups

4.9.2 Anxiety

Results showed that 62 participants with 197 observations were analysed. The average number of times participants completed the questionnaire packs was 3; ranging from 1 – 4.

The model, described in Table 4.12 Random Effects Regression of Anxiety, was significant, χ^2 (17) = 36.27, $p < .01$. Results are shown below and it can be seen that level of anxiety was significantly influenced by time ($p<.01$), and age, ($p<.05$) and one of the workplaces ($p<.000$), with another approaching significance ($p=0.07$). The intervention (PMT) did not have a significant effect ($p=.33$, *ns*).

Table 4:12 Random Effects Regression of Anxiety with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors.

Anxiety	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	-0.83	0.27	-3.10	0.00	-1.35	-0.31
Group	-1.60	1.65	-0.97	0.33	-4.82	1.63
Listening	-0.02	0.03	-0.69	0.49	-0.09	0.04
Work	0.84	2.52	0.34	0.74	-4.09	5.78
Gender	0.39	1.97	0.20	0.84	-3.48	4.26
Age	-0.21	0.09	-2.43	0.02	-0.38	-0.04
Place						
1	1.56	6.01	0.26	0.80	-10.23	13.35
2	2.49	5.81	0.43	0.67	-8.90	13.89
3	5.76	4.08	1.41	0.16	-2.23	13.76
4	2.81	3.23	0.87	0.38	-3.52	9.15
5	-0.04	3.67	-0.01	0.99	-7.23	7.15
6	1.64	4.53	0.36	0.72	-7.23	10.51
7	1.24	2.84	0.44	0.66	-4.33	6.81
8	1.64	2.40	0.68	0.50	-3.07	6.34
9	26.47	6.35	4.17	0.00	14.03	38.92
11	-5.16	6.29	-0.82	0.41	-17.49	7.17
12	12.51	6.84	1.83	0.07	-0.90	25.92

The graph, Figure 4:29 Anxiety Levels at Each Time Point in the Control and Intervention Groups, below, illustrates anxiety levels at each time point in both the control and intervention group. Analysis of the individual time points is reported in Section 4.11.3 and shows no significant difference between the groups at each time point.
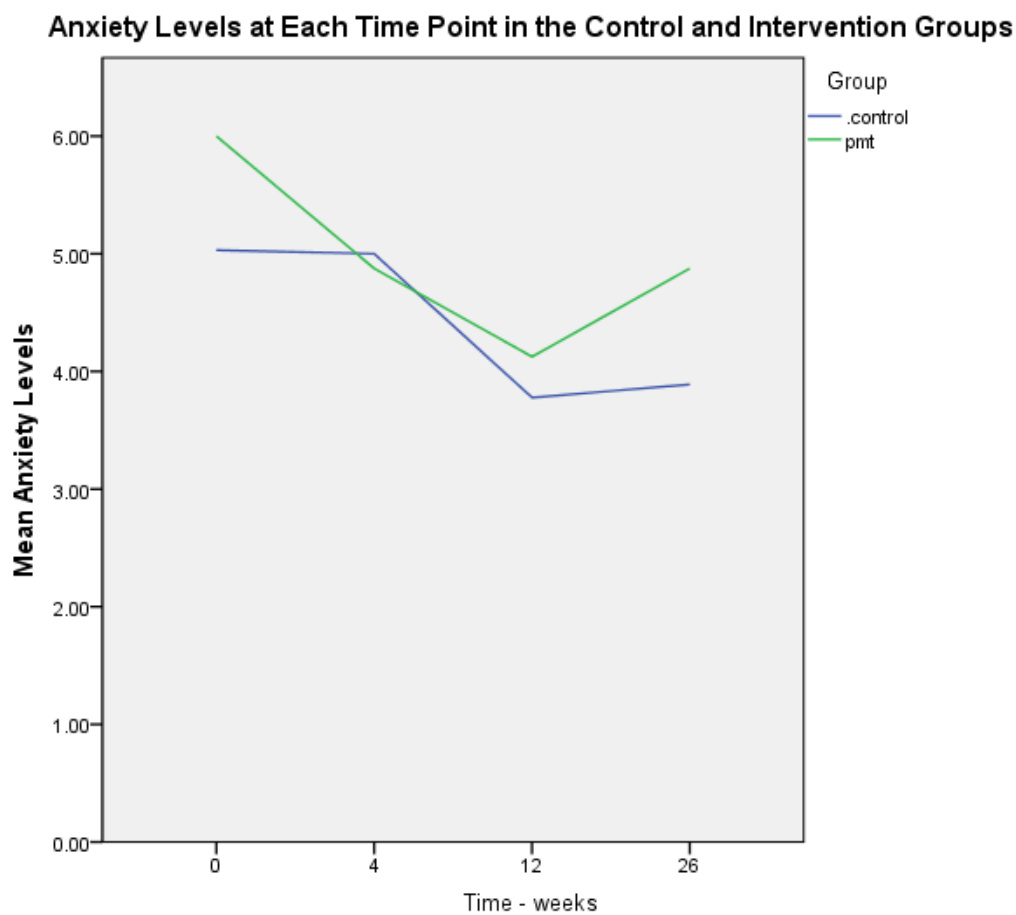
Figure 4:29 Anxiety Levels at Each Time Point in the Control and Intervention Groups

4.9.3 Stress

Results showed that 62 participants with 197 observations were analysed. The average number of times participants completed the questionnaire packs was 3; ranging from 1 – 4.

The model, described in Table 4.13 Table Random Effects Regression of Stress, was significant, $\chi^2 (17) = 28.04$, $p < .05$. Results are shown below and it can be seen that level of stress was significantly influenced by time ($p<.00$), and one workplace, ($p<.05$). The influence of group did not have a significant effect ($p=.19$, *ns*). The influence of age was approaching significance, ($p=0.06$).

Table 4:13 Table Random Effects Regression of Stress with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors

Stress	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	-1.37	0.39	-3.51	0.00	-2.14	-0.61
Group	-2.49	1.92	-1.30	0.19	-6.26	1.27
Listening	-0.04	0.04	-0.94	0.35	-0.12	0.04
Work	1.15	2.96	0.39	0.70	-4.64	6.95
Gender	-1.17	2.30	-0.51	0.61	-5.68	3.34
Age	-0.19	0.10	-1.90	0.06	-0.39	0.01
Place						
1	2.34	7.03	0.33	0.74	-11.44	16.12
2	3.50	6.71	0.52	0.60	-9.65	16.66
3	1.94	4.91	0.39	0.69	-7.69	11.56
4	-5.09	3.77	-1.35	0.18	-12.47	2.30
5	-2.00	4.29	-0.47	0.64	-10.41	6.41
6	1.67	5.30	0.31	0.75	-8.72	12.06
7	-0.12	5.35	-0.04	0.97	-6.68	6.44
8	-2.40	2.79	-0.86	0.39	-7.86	3.07
9	15.11	7.56	2.00	0.05	0.28	29.93
11	-1.49	7.49	-0.20	0.84	-16.17	13.19
12	16.61	8.13	2.04	0.04	0.69	32.54

The graph below, Figure 4:30 Stress Levels at Each Time Point in the Control and Intervention Groups illustrates stress levels at each time point in both the control and intervention group. Analysis of the individual time points is reported in Section 4.11.3 and shows no significant difference between the two groups at each time point.
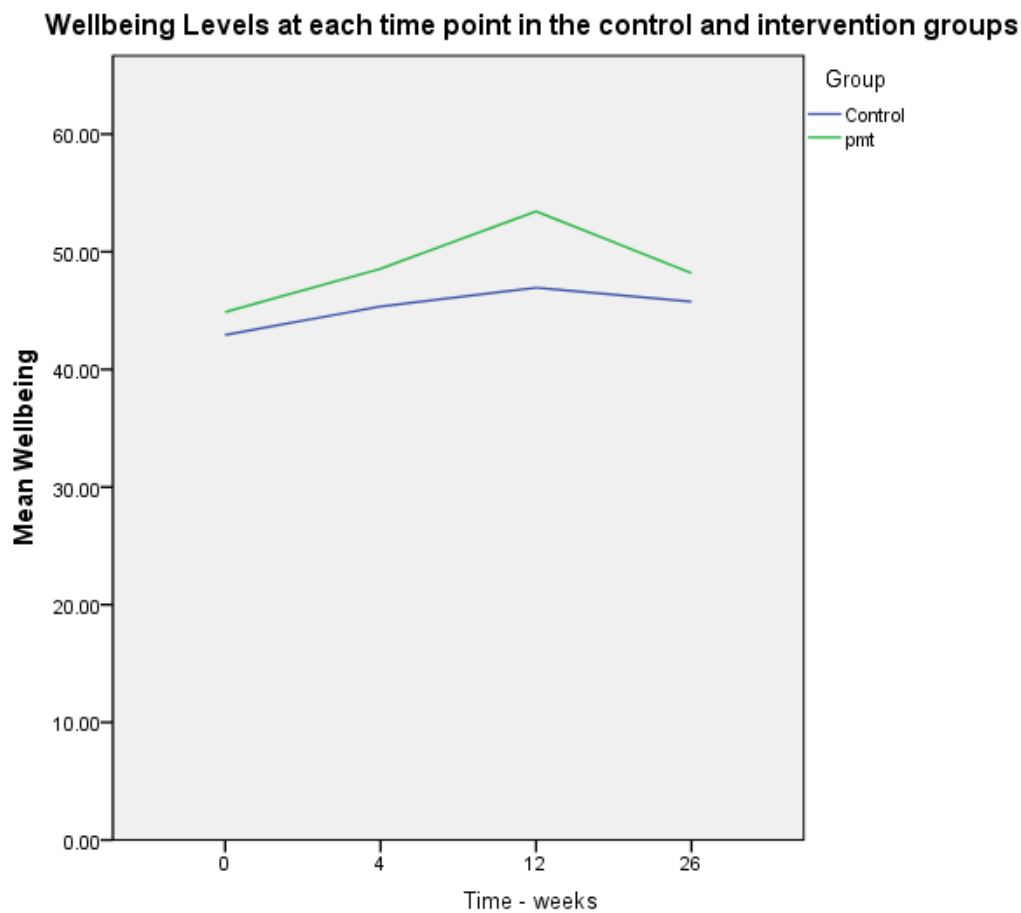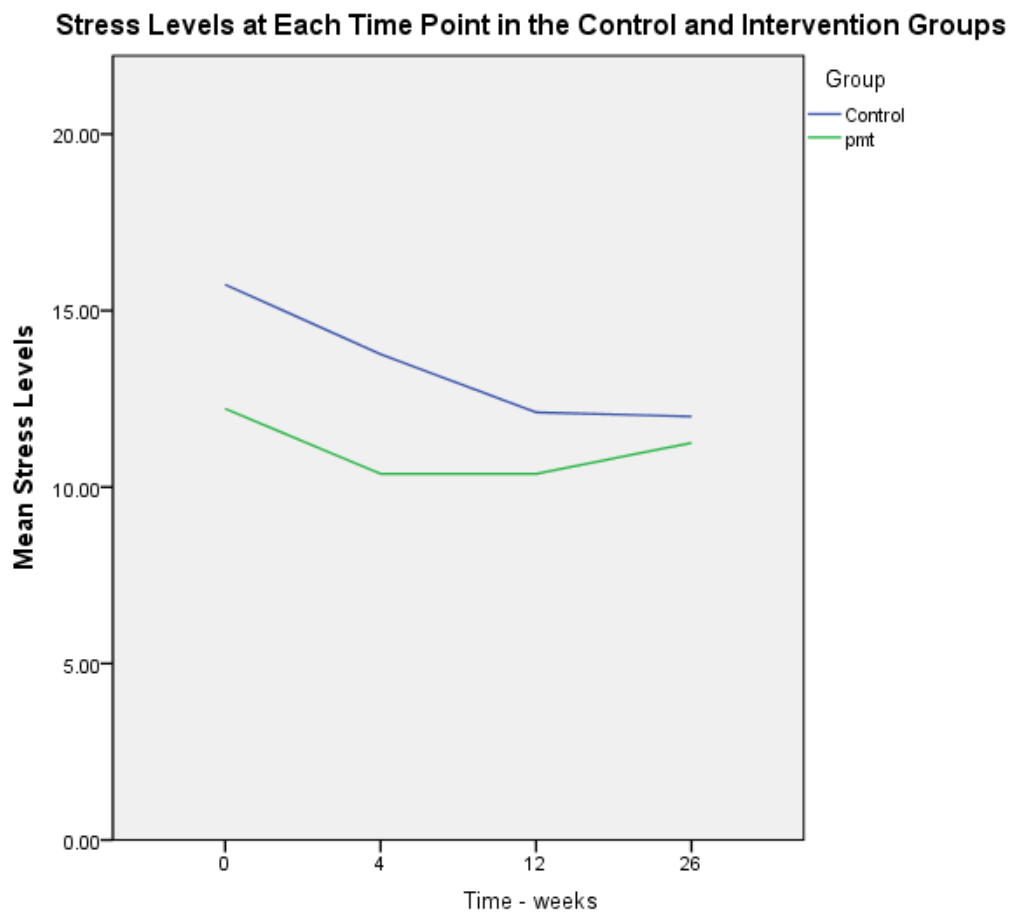
Figure 4:30 Stress Levels at Each Time Point in the Control and Intervention Groups

4.9.4 DASS Total

Results showed that 62 participants with 194 observations were analysed. The average number of times participants completed the questionnaire packs was 3, ranging from 1 – 4.

The model, described in Table 4.14 Random Effects Regression of DASS Total Score, was significant, χ^2 (17) = 38.18, $p < .01$. Results are shown below and it can be seen that level of DASS total score was significantly influenced by time ($p<.00$), age

($p<.01$) and the effect of the intervention (PMT) is approaching having a significant influence ($p=.08$).

Table 4:14 Random Effects Regression of DASS Total Score with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors.

DASS total	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	-3.24	0.80	-4.03	0.00	-4.81	-1.66
Group	-8.32	4.69	-1.78	0.08	-17.51	0.86
Listening	-0.11	0.10	-1.14	0.26	-0.30	0.08
Work	3.55	7.17	0.50	0.62	-10.50	17.60
Gender	0.74	5.61	0.13	0.90	-10.27	11.74
Age	-0.66	0.25	-2.66	0.01	-1.14	-0.17
Place						
1	1.62	17.12	0.09	0.92	-31.94	35.18
2	1.49	16.51	0.09	0.93	-30.87	33.85
3	12.89	11.68	1.10	0.27	-10.00	35.78
4	-2.30	9.19	-0.25	0.80	-20.31	15.71
5	-0.34	10.70	-0.03	0.98	-21.31	20.64
6	6.84	12.89	0.53	0.60	-18.43	32.10
7	4.66	8.10	0.58	0.57	-11.21	20.53
8	-3.46	6.84	-0.51	0.61	-16.87	9.94
9	61.62	18.14	2.85	0.00	16.07	87.17
11	-16.45	17.97	-0.92	0.36	-51.66	18.77
12	48.56	19.54	2.49	0.01	10.27	86.85

The graph below, Figure 4:31 DASS total Levels at Each Time Point in the Control and Intervention Groups, illustrates the DASS total levels at each time point in both the control and intervention group. Analysis of the individual time points is reported in Section 4.11.3 and shows no significant difference between the groups at each time point.

DASS Total Score at Each Time Point in the Control and Intervention Group
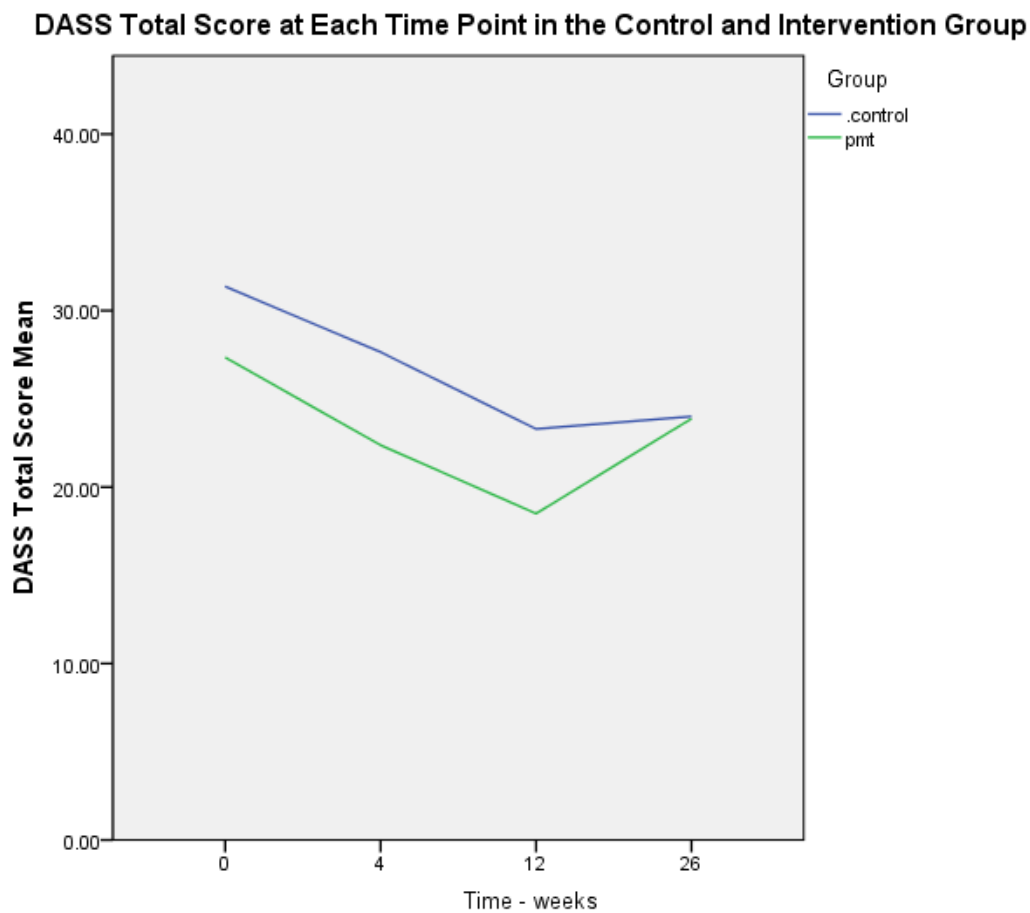
Figure 4:31 DASS total Levels at Each Time Point in the Control and Intervention Groups

4.9.5 Maslach Burnout Inventory Variables

4.9.6 Exhaustion

Results showed that 62 participants with 196 observations were analysed. The average number of times participants completed the questionnaire packs was 3, ranging from 1 – 4.

The model, described in Table 4:15 Random Effects Regression of Exhaustion with Time, was significant, $\chi^2\,(17) = 31.83$, $p< .05$. Results are shown below and it can be seen that level of exhaustion was significantly reduced by time ($p<.05$), and amount listened ($p<.01$) but there was no significant effect of group ($p=.16$, *ns*).

Table 4:15 Random Effects Regression of Exhaustion with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors

Exhaustion	Coeff	Std. Err	z	P>|z|	95% C.I.	
						-
Time	-0.12	0.05	-2.34	0.02	-0.20	0.18
Group	-0.39	0.28	-1.41	0.16	-0.94	0.15
Listening	-0.01	0.01	-2.56	0.01	-0.03	0.00
Work	-0.26	0.43	-0.60	0.55	1.10	0.58
Gender	-0.61	0.34	-1.82	0.07	-1.27	0.05
Age	-0.12	0.01	-0.81	0.42	-0.04	0.02
Place						
1	-0.14	1.02	-0.14	0.89	-2.15	1.86
2	-0.72	0.99	-0.73	0.47	-2.65	1.22
3	-1.19	0.70	-1.71	0.09	-2.55	0.18
4	-0.78	0.55	-1.42	0.15	-1.86	0.29
5	-0.66	0.62	-1.06	0.29	-1.89	0.56
6	0.35	0.80	0.45	0.65	-1.16	1.86
7	-0.40	0.48	-0.83	0.40	-1.35	0.54
8	-0.19	0.41	-0.47	0.64	-0.99	0.61
9	3.05	1.08	2.82	0.01	0.93	5.17
11	-1.25	1.07	-1.17	0.24	-3.35	0.85
12	-0.40	1.16	-0.34	0.73	-2.68	1.88

The graph below, Figure 4:32 Exhaustion Levels at Each Time Point in the Control and Intervention Groups illustrates exhaustion levels at each time point in both the control and intervention group. Analysis of the individual time points, as reported fully in Section 4.11.2, shows that exhaustion was significantly lower, with a medium effect size, at 26 weeks compared to the intervention group.
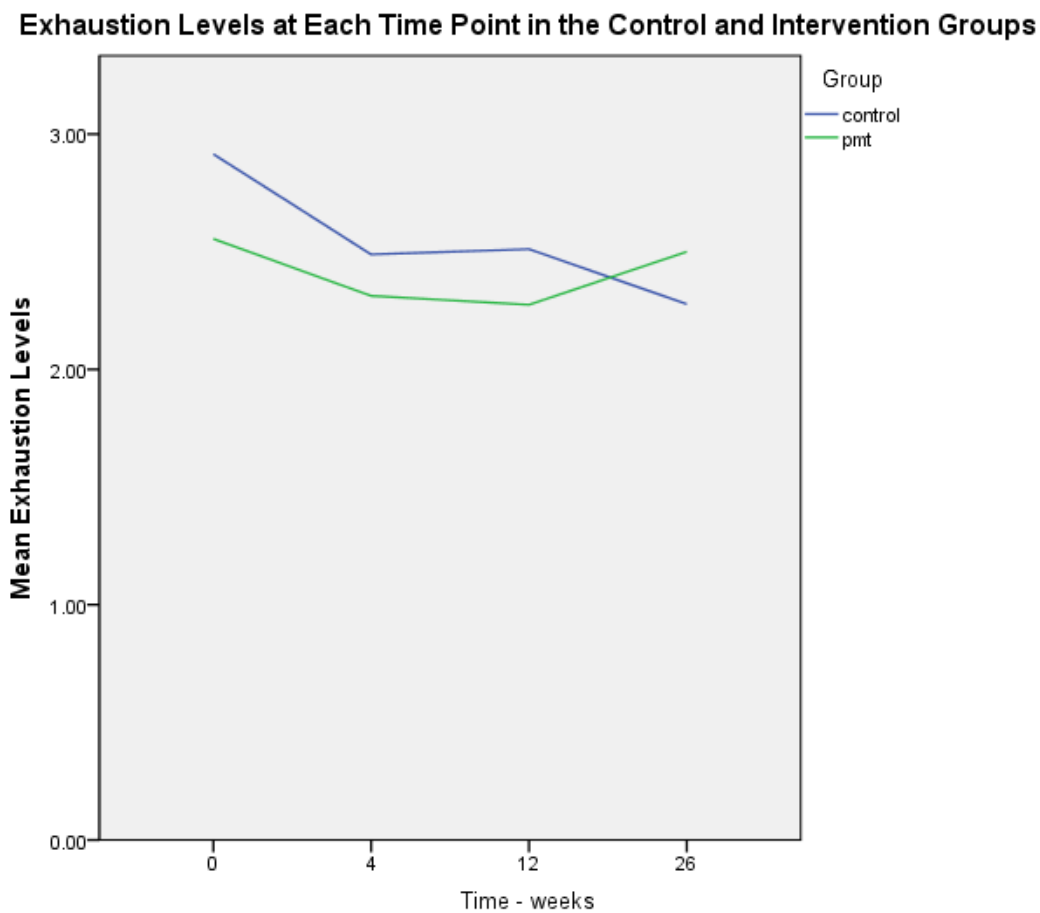
Figure 4:32 Exhaustion Levels at Each Time Point in the Control and Intervention Groups

4.9.7 Cynicism

Results showed that 62 participants with 197 observations were analysed. The average number of times participants completed the questionnaire packs was 3 ranging from 1 – 4.

The model, described in Table 4:16 Random Effects Regression of Cynicism, was significant, χ^2 (17) = 29.07, $p <$ .05. Results are shown below and it can be seen that level of cynicism was significantly influenced by time ($p<$.05), and the group ($p<$.01), indicating that PMT had a significant effect on reducing cynicism. Age and gender were also found to have a significant effect on cynicism (both $p<$.01), with youth and being female predicting higher levels of cynicism.

The graph below, Figure 4:33 Cynicism Levels at Each Time Point in the Control and Intervention Groups, illustrates cynicism levels over time, in each group, and cross-sectional analysis by ANCOVA, reported later in Section 4.11.2, revealed that, compared to the intervention group, the control group had significantly lower levels of cynicism at time 26. This result seems to contradict that of the longitudinal analysis and data were explored to explain these findings. One explanation of this may be that the longitudinal finding of the benefit of PMT on cynicism was possibly a result of a combination of factors, such as age and gender which both had significant effects on cynicism.

Due to the contradictory results of the longitudinal and ANCOVA analyses of effects of PMT on cynicism, great caution will be exercised in the interpretation of this result and what it means to the wider study.

Table 4:16 Random Effects Regression of Cynicism with Time, group (PMT), Listening, Work (part time/ full time), gender, age and place of work as predictors

Cynicism	Coeff	Std. Err	z	P>|z|	95% C.I.	
Time	-0.11	0.05	-2.28	0.02	-0.21	-0.15
Group	-0.71	0.26	-2.68	0.01	-1.22	-0.19
Listening	-0.01	0.01	-1.53	0.13	-0.02	0.00
Work	0.69	0.40	1.70	0.09	-0.10	1.48
Gender	-0.65	0.31	-2.07	0.04	-1.27	-0.04
Age	-0.04	0.01	-2.74	0.01	-0.65	-0.01
Place						
1	-1.02	0.96	-1.06	0.29	-2.90	0.87
2	0.14	0.92	0.16	0.88	-1.67	1.95
3	-0.10	0.66	-0.16	0.88	-1.40	1.20
4	-1.20	0.52	-2.33	0.02	-2.21	-0.19
5	-0.52	0.59	-0.89	0.38	-1.67	0.63
6	-1.06	0.72	-1.46	0.15	-2.48	0.36
7	-0.25	0.46	-0.55	0.59	-1.14	0.64
8	-0.45	0.38	-1.18	0.24	-1.20	0.30
9	1.62	1.03	1.58	0.12	-0.39	3.63
11	-0.60	1.02	-0.59	0.55	-2.59	1.39
12	0.65	1.10	0.59	0.55	-1.51	2.81
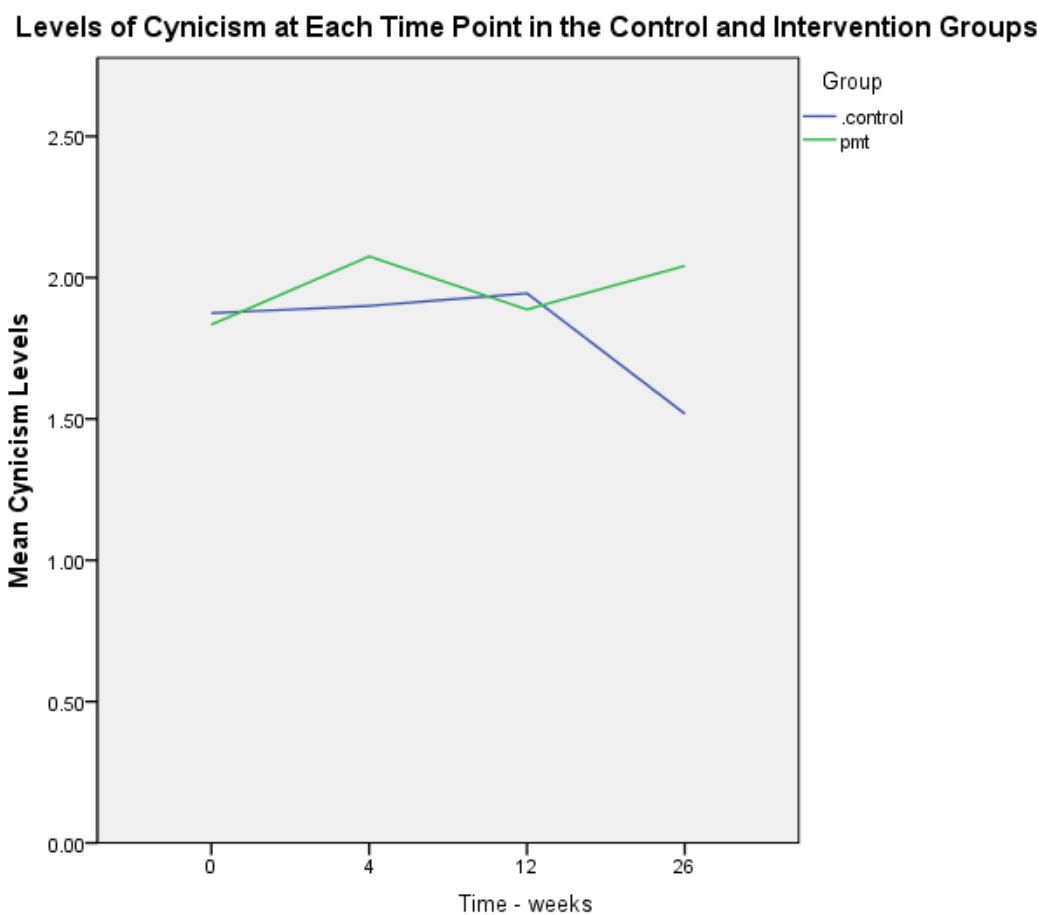
Figure 4:33 Cynicism Levels at Each Time Point in the Control and Intervention Groups

4.9.8 Personal Efficacy

Results showed that 62 participants with 197 observations were analysed. The average number of times participants completed the questionnaire packs was 3, ranging from 1 – 4.

The random effects regression model, with time, group (PMT), listening, work (part time/ full time), gender, age and place of work as predictors of personal efficacy, was not significant, χ^2 (17) = 24.67, p =.87, ns and therefore these variables did not significantly affect personal efficacy.

The graph below, Figure 4:34 Personal Efficacy Levels at Each Time Point in the Control and Intervention Groups, illustrates personal efficacy scores across time in both groups and it can be seen that there was little change in this variable. The ANCOVA analysis reported in Section 4.11 confirmed that there were no significant difference between the groups at each time point.
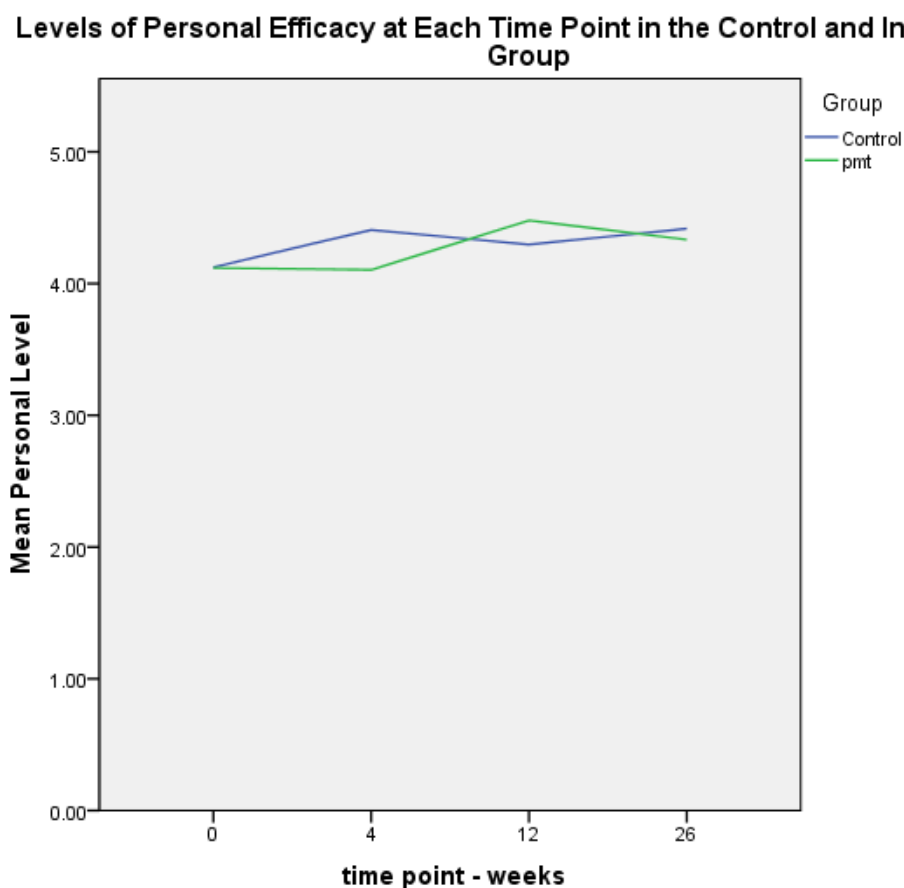
Figure 4:34 Personal Efficacy Levels at Each Time Point in the Control and Intervention Groups

4.10 **Hypothesis 3**

A higher degree of engagement with Positive Mental Training will be correlated with a greater increase in mental wellbeing and mental health.

Engagement was reflected in the total number of times a participant listened to the recordings, as described in section 4.6. A scatterplot was drawn to investigate the relationship between wellbeing and listening. It can be see that while those who had a high level of engagement in the PMT group had an increase in wellbeing, there was no improvement in wellbeing with increased listening in the control group.
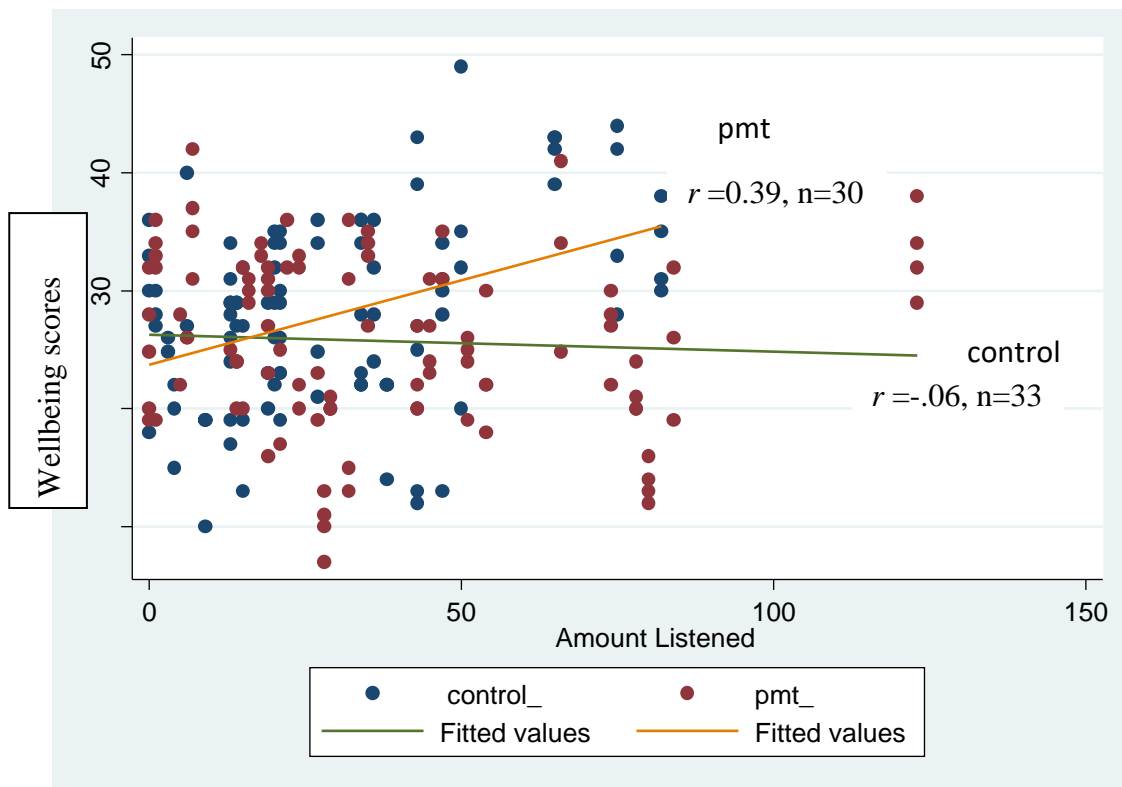
Figure 4:35 Scatterplot of wellbeing scores and amount listened (number of times) to recordings for participants in the control and intervention (pmt) groups, with regression lines fitted.

Following up on the scatterplot, bivariate correlations of amount listened (sumtracks variable) and the change scores of the outcome variables from 0 – 12 weeks was also carried out. As the listening variable was non normally distributed Spearman's Rho correlation statistic was used.

The table of correlations are shown below, in Table 4:17 Intervention and Control Group correlation coefficients for the amount listened with variable change scores between 0 - 12 weeks. It can be seen that there were no significant correlations between amount listened and outcome variable change in the control group.

In the PMT intervention group, amount listened was significantly positively correlated with the change score in:

Wellbeing (WEMWBS) ($n=21$, $r = .50$, $p<.05$),

Mindfulness (FMI) ($n=21$, r=.46, $p<.05$),

Personal efficacy (MBI_PE) ($n=21$, $r=.45$, $p<.05$)

and significantly negatively correlated with total depression, anxiety & stress score

DASS Total Score ($n=20$, $r = -0.44$, $p<.05$).

Exhaustion ($n=21$, , $r = -0.40$, $p<.05$)

The amount the intervention was listened to, was associated with a large effect size on personal efficacy, and a medium effect size on wellbeing, mindfulness, overall depression anxiety and stress scale and exhaustion.

The fact that listening to the intervention, and not the control, was significantly associated with increases in wellbeing, mindfulness and personal efficacy (an aspect of reduced burnout) and a reduction in overall depression, anxiety and stress level and exhaustion, suggests that the more the intervention is listened to, the greater the benefits. However as this association is a correlation, cause and effect cannot be assumed and it may be that improvements in psychological wellbeing resulted in increased listening to the intervention.

Table 4:17 Intervention (PMT) and Control Group correlation coefficients for the amount listened with variable change scores between 0 - 12 weeks

Variable/ Spearman's Rho	Wellbeing	Resilience	Mindfulness	Exhaustion	Cynicism	Efficacy	DASS Total	Stress	Depression	Anxiety	Listening
Listening											
PMT	0.50*	0.26	0.46*	-0.40*	0.06	0.45*	-0.44*	-0.26	-0.32	-0.1	1
n	21	21	21	21	21	21	20	21	20	20	30
control	0.10	0.13	0.19	0.01	-0.10	0.14	-0.21	-0.16	-0.03	-0.20	1
n	22	23	22	22	23	23	23	23	23	23	33

*$p<.05$; ** $p<.01$; ***$p<.001$; a $p=0.058$; Wellbeing = WEMWBS; Resilience =CDRISC10; Mindfulness=FMI; Exhaustion = MBI_EX; Cynicism=MBI_CY; Personal Efficacy = MBI_PE; Stress = DASS_S; Depression = DASS_D; Anxiety =DASS_A*

4.11 **Hypothesis 4:**

Any effect of Positive Mental Training on increasing wellbeing, resilience, mindfulness and mental health will increase over the timespan of the intervention and be maintained after the intervention has finished.

This hypothesis was tested using an analysis of covariance (ANCOVA), with the baseline variable measure as covariate for each of the 3 variables. This type of analysis takes a cross sectional view of each time period and therefore makes it clearer to see the effects at individual time periods. This type of analysis is commonly employed within evaluation research (for example Millear *et al.* 2008, Grime, 2004). Using the baseline as a covariate helps to minimise within- group variance and by adding it into the theoretical model, helps to give a more accurate estimate of the effect of the conditions on the outcome (Field 2009). Additionally the analysis was also run with the amount listened as a covariate and results revealed no differences to the significances and small differences to effect sizes, which are shown in the table below.

The Bonferroni correction was applied to control for type 1 error. Levene's test, for each variable at each time point, was non-significant indicating assumptions of sphericity were met (values reported in appendix). Results of the analyses are shown in the tables below.

4.11.1 Wellbeing, Mindfulness and Resilience

Table 4.18: ANCOVA Analyses For Hypothesis 4, shows that for wellbeing, mindfulness and resilience:

1) At 4 weeks there was no significant differences between the control and intervention groups

2) At 12 weeks wellbeing was significantly higher in the PMT group compared to the control group, $F(1, 30) = 7.36$, $p<.01$, $\eta^2=.20$; and resilience and mindfulness were not significantly different in the control and intervention groups

3) At 26 weeks, resilience and wellbeing were not significantly different in the control and intervention groups. Mindfulness, although not significantly higher in the PMT group, $F(1, 30) = 3.31$, $p = .08$, *ns,* the increase showed a small effect size, $\eta^2=.10$, which increased to a medium effect size , $\eta^2=.12$, when listening was controlled for. This suggests that failure to reject the null hypothesis could reflect there may be a type II error.

Table 4:18 **ANCOVA Analyses For Hypothesis 4: Variables With Time 0 Scores For Each Measure Used As The Covariate For That Comparison**

Time Points	Adjusted Mean		Adjusted mean difference	95% CI	F *	p	η^2	Listen cov. ʃ η^2
	PMT (SE)	Control (SE)						
4 weeks								
Wellbeing	47.76 (1.38)	46.11 (1.34)	1.65	-2.31 to 5.60	0.73	>.05	0.02	0.04
Resilience	26.50 (0.72)	27.06(0.68)	-0.56	-2.59 to 1.46	0.32	>.05	0.01	0.01
Mindfulness	36.25 (1.17)	35.71(1.14)	0.54	-2.79 to 3.88	0.11	>.05	0.00	0.01
12 weeks								
Wellbeing	52.78 (1.38)	47.56(1.34)	5.23	1.29 to 9.16	7.36	0.01	0.20	0.20
Resilience	28.18 (1.08)	26.17(1.02)	2.01	-1.04 to 5.05	1.81	>.05	0.06	0.06
Mindfulness	39.60 (1.61)	38.80(1.57)	0.79	-3.80 to 5.39	0.13	>.05	0.00	0.01
26 weeks								
Wellbeing	47.54 (1.78)	46.38(1.72)	1.16	-3.91 to 6.24	0.22	>.05	0.01	0.01
Resilience	26.98 (1.04)	26.51 (.98)	0.47	-2.45 to 3.40	0.11	>.05	0.00	0.00
Mindfulness	40.00 (1.35)	36.60(1.31)	3.41	-0.42 to 7.24	3.31	0.079	0.10	0.12

Wellbeing = WEMWBS; Resilience = CDRISC; Mindfulness = FMI

η^2 *= partial eta squared; * df = (1,30) for Wellbeing & FMI; (1,32) for resilience*

ʃ η^2 *with amount listened as a covariate*

Additional analysis was carried out within the PMT group comparing differences at each time point. Results for wellbeing show that there was a significant increase with time between baseline and 12 weeks, but the difference between 12 and 26 weeks was not significant, suggesting that wellbeing increased during the intervention period but this was not maintained, after the intervention had finished, at follow up.

Table 4:19   Differences between Time Points in Wellbeing in the PMT Group

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1 (0 wks)	2 (4 wks)	-3.69	1.58	0.20	-8.47	1.10
1 (0 wks)	3 (12 wks)	-8.56[*]	1.63	0.00	-13.51	-3.62
1 (0 wks)	4 (26 wks)	-3.31	2.21	0.93	-10.02	3.39
2 (4 wks)	3 (12 wks)	-4.88	1.70	0.07	-10.04	0.29
2 (4wks)	4 (26 wks)	0.38	2.15	1.00	-6.14	6.89
3 (12 wks)	4 (26 wks)	5.25	2.21	0.19	-1.47	11.97

Results for mindfulness in the PMT group, showed that the difference between 0 and 12 weeks was significant, and the difference between 0 and 26 weeks was also significant, but to a stronger extend. As the difference between 12 and 26 weeks was not significant, these results suggest that mindfulness increased with time during the intervention period and that this increase was maintained, but not increased, at follow up.

Table 4:20 Mindfulness mean comparisons at the 4 time points in the PMT group

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1 (0 wks)	2 (4 wks)	-2.06	1.12	0.51	-5.46	1.34
1 (0 wks)	3 (12 wks)	-5.44[*]	1.66	0.03	-10.48	-0.40
1 (0 wks)	4 (26 wks)	-5.81[*]	1.51	0.01	-10.39	-1.23
2 (4 wks)	3 (12 wks)	-3.38	1.30	0.12	-7.33	0.58
2 (4 wks)	4 (26 wks)	-3.75	1.69	0.26	-8.90	1.40
3 (12 wks)	4 (26 wks)	-0.38	1.59	1.00	-5.20	4.45

4.11.2 Exhaustion, Cynicism and Personal Efficacy

Table 4:21 ANCOVA Analyses; Maslach Burnout Inventory Subscales, shows the results of the 3 burnout variables - exhaustion, cynicism and personal efficacy and shows that:

1) At 4 weeks and 12 weeks there were no significant differences between the groups
2) At 26 weeks the PMT group had significantly higher levels of exhaustion, F (1, 31) = 6.58, $p<.05$, $\eta^2=.18$ than the control group, and cynicism levels were approaching being significantly higher in the PMT group, $F(1, 31) = 3.99$, $p=.06$, $\eta^2=.11$.

Adding amount listened as a covariate lessened the effect slightly, as demonstrated by the effect sizes shown in the table below.

Table 4:21 : ANCOVA Analyses,: Maslach Burnout Inventory Subscales: At Each Time Point with baseline scores as the covariate

Time Points	Adjusted PMT (SE)	Mean Control (SE)	Adjusted mean difference	95% CI	F	p	η^2	Listen cov. ∫ η^2
					(1,31)			
4 weeks								
Exhaustion	2.45(.29)	2.36(2.8)	.09	-.73 to 91	0.49	p>.05	.00	.00
Cynicism	1.09(.21)	1.89(.20)	0.215	-.39 to.80	0.493	p>.05	.02	.01
Efficacy	4.11 (.15)	4.41 (.15)	-0.30	-.73 to .13	2.01	p>.05	.06	.06
12 weeks								
Exhaustion	2.42 (.25)	2.38(.23)	0.04	-.65 to -.73	0.16	p>.5	.01	.00
Cynicism	1.90 (.25)	1.93(.23)	-0.03	-.72 to .66	0.006	p>.05	.00	.00
Efficacy	4.48 (.21)	4.30 (.19)	0.19	-.39 to .76	0.426	p>.05	.01	.02
26 weeks								
Exhaustion	2.69(.16)	2.11(.15)	-0.57	.12 to 1.0	6.58	p<.05	.18	.15
Cynicism	2.06 (2.0)	1.51 (1.9)	0.55	-.01 to 1.11	3.99	p=.06	.11	.11
Efficacy	4.34 (.21)	4.42 (.20)	-0.08	-.66 to .50	0.78	p>.05	.00	.00

∫ η^2 with amount listened as a covariate

The results of cynicism and exhaustion at 26 weeks ran counter to those expected, and found in previous research (Thompson 2012a) and due to concern that the PMT intervention may be causing harm, these variables were further explored. It can be seen from the results of paired *t* tests, Table 4.22 and 4.23 that in the control group exhaustion and cynicism had a statistically significant improvement over the time period, with a trend for cynicism to continue improving at 26 weeks.

Results for the PMT group show no significant change over the whole period or from 12 weeks to 26 weeks. This confirms that the statistical significance between the groups in exhaustion and cynicism was due to a decrease in the control group rather than an increase in the PMT group.

Table 4:22 Paired Samples Statistics and t test for Exhaustion and Cynicism in the control group

		Mean	N	Std. Deviation	Std. Error Mean	t	df	sig 2 tailed
Pair 1	MBI_EX_0	2.78	28.00	1.26	.24			
	MBI_EX_26	2.12	28.00	1.16	.22	4.27	27	.00
Pair 2	MBI_CY_0	1.72	28.00	1.16	.22			
	MBI_CY_26	1.38	28.00	.94	.18	2.3	27	.04
Pair 3	MBI_EX_12	2.35	24.00	1.32	.27			
	MBI_EX_26	2.15	24.00	1.20	.24	.99	23	.33
Pair 4	MBI_CY_12	1.86	24.00	1.15	.24			
	MBI_CY_26	1.44	24.00	.97	.20	2.04	23	.05

Table 4:23 Paired Samples Statistics & t test for Exhaustion and Cynicism in the PMT group

		Mean	N	Std. Deviation	Std. Error Mean	t	df	sig 2 tailed
Pair 1	MBI_EX_0	2.29	31.00	1.46	.26			
	MBI_EX_26	2.23	31.00	1.37	.25	.420	30	.68
Pair 2	MBI_CY_0	1.96	31.00	1.16	.21			
	MBI_CY_26	1.70	31.00	1.08	.19	1.29	30	.21
Pair 3	MBI_EX_12	2.09	23.00	1.36	.28			
	MBI_EX_26	2.35	23.00	1.38	.29	-1.25	22	.22
Pair 4	MBI_CY_12	1.77	23.00	1.43	.30			
	MBI_CY_26	1.93	23.00	1.15	.24	-.731	22	.47

4.11.3 DASS Variables

Table 4:24 Non-Parametric Analysis of PMT & Control group, displays results for the non-parametric DASS variables; depression, anxiety and total score. These variables violated the assumptions of ANCOVA, and therefore a Mann-Whitney test, a non-parametric test for comparing median scores, was used to assess statistical difference between control and PMT groups at each time point.

Results show no significant difference between the groups at each time point. However the depression variable showed a small effect size at 12 weeks (r=-.21) and the fact that the difference was not significant suggests that failure to reject the null hypothesis could reflect a type II error.

Table 4:24 Non-Parametric Analysis of PMT & Control group; median scores (Mann Whitney test) of DASS subgroups - depression, anxiety & total scores for each time period

Time Points	no	Mann Whitney U	z	sig	r
4 weeks					
Depression	49	265.00	-0.71	ns	-0.14
Anxiety	50	323.00	0.22	ns	0.04
Total	49	261.00	-0.78	ns	-0.16
12 weeks					
Depression	51	266.00	-1.11	ns	-0.21
Anxiety	51	300.00	-0.48	ns	-0.09
Total	51	307.50	-0.31	ns	-0.06
26 weeks					
Depression	59	393.00	-0.63	ns	-0.12
Anxiety	59	433.00	-0.02	ns	0.00
Total	58	391.00	-0.43	ns	-0.08

r= effect size

The stress variable was parametrically distributed and therefore an ANCOVA was carried out. The results are shown in Table 4.25: ANCOVA Stress scores At Each Time Point with baseline scores as the covariate. As can be seen there is no significant difference between the groups at any time point.

Table 4:25 ANCOVA Stress scores At Each Time Point with baseline scores as the covariate

Time Points	Adjusted Mean		Adjusted mean difference	95% CI	F	p	η^2	Listen cov. $^\int$ η^2
	PMT (SE)	Control (SE)						
4 weeks	11.04(1.81)	12.79 (1.76)	1.39	3.81-6.60	0.23	0.59	0.01	0.01
12 weeks	11.55 (1.67)	11.01 (1.62)	-0.54	-5.34-4.24	0.05	0.82	0.02	0.00
26 weeks	12.31 (1.78)	11.00 (1.70)	-1.31	-3.8-6.42	0.27	0.61	0.01	0.00

$^\int \eta^2$ *with amount listened as a covariate*

4.12 **Summary of Results**

1   100 employees participated in the study.   68% were women. 83% were in full time employment and the mean age was 42.5 years (SD 9.48) ranging between 25 – 65 years.

2   Data was collected at weeks 0, 4, 12 and 26 weeks.

3   51 participants were allocated to the control group and 49 to the intervention group.

4   There was no statistical difference between the groups at week 0 in demographics or variable scores.

5   All variables had baseline scores within reported norms.

6   There was a high rate of attrition in this study, with approximately 50% missing data, which was missing completely at random and not significantly different in each group.

7   Longitudinal analysis showed:
   a. A differential effect between the groups in wellbeing and depression variables - The intervention significantly increased wellbeing and significantly decreased depression compared with the control.
   b. Listening to music (i.e. the control) and the intervention both showed similarly significant improvements in mindfulness, stress, anxiety, mental distress (DASS total) and exhaustion (i.e. no significant difference between the groups)
   c. Resilience and personal efficacy did not increase over the study period in either group

8   ANCOVA analysis revealed that

    a. The effect of the intervention on wellbeing and depression was due to a difference at 12 weeks only, which was not sustained at follow up (26 weeks)

    b. Mindfulness showed a small effect size difference at 12 weeks and a medium effect size difference at 26 weeks between the intervention and control.

    c. Exhaustion was statistically lower in the control group than the intervention group at 26 weeks.

9   There was no statistical difference in the amount of listening between the control and intervention group.

10   Listening to the intervention was significantly associated with improvements in mental health indictors. There were medium associations between amount listened to PMT and improvements in personal efficacy ($n=21$, $r=.45$, $p<.05$), wellbeing ($n=21$, $r = .50$, $p<.05$), mindfulness ($n=21$, $r=.46$ $p<.05$), total depression anxiety and stress score ($n=20$, $r = -0.44$, $p<.05$) and exhaustion ($n=21$, $r = -0.40$, $p<.05$).

11   Analysis of gender showed that men engaged more with the programme. Women listened less. However this differential gender pattern of listening was unaffected by group allocation.

5 Discussion

This study sought to investigate the effect of a health promotion programme, Positive Mental Training (PMT), on healthy volunteers in the workplace. It was hypothesised that PMT would improve wellbeing and mental health compared to a control. Longitudinal analysis of this RCT workplace study supported this hypothesis in that the intervention, Positive Mental Training, significantly increased wellbeing and significantly decreased depression compared with control.

Entry characteristics were in line with the TUC findings that public sector workers have a high degree of stress and showed that the study participants had lower wellbeing levels and higher mental distress, depression, anxiety and stress levels compared to the reported UK population means, indicating that this present study did not just recruit the 'worried well' (a recognised concern for volunteer studies, Goetzel and Ozminkowski, (2008). It also illustrates the ability of these employees to recognise their need for mental wellbeing skills and demonstrates the demand and requirement for mental health promotion in the workplace.

The longitudinal analysis also revealed that for several of the variables (mindfulness, exhaustion, stress, anxiety and the total depression, anxiety, stress scale (DASS)) the effect of the control (i.e. listening to music) was as effective as listening to the intervention. In this current study, in order to double blind, both groups were told that the condition to which they had been allocated could be expected to have a beneficial effect on their wellbeing by increasing relaxation and reducing stress, thus potentially creating an equal expectation in the participants of a positive outcome. Positive expectation has also been found to be a contributing factor in participation in a self-help stress management study (Hasson *et al.* 2010). Non-specific placebo effects are thought to come about through positive expectancy (Kirsch, 1999). It has been proposed that this relationship is mediated by effort, with effort having its effect through generated positive mood from engaging in the activity (Gaitan-Sierra & Hyland, 2011). Positive expectations of health outcomes have been found to influence

mood and physical symptoms, (on exposure to a wind farm, Crichton *et al.* 2013) and have been shown to be a strong predictor of recovery in depressed patients (Sotsky *et al.*, 1991). Thus the fact that participants in this current study may have expected to feel better, may account for the fact that for some outcomes, control performed as well as the intervention. Similarities in outcomes may also result from those in the control group listening to music. The benefit of listening to music have been reported by other researchers, e.g. for sleep, (Ziv *et al.* 2008) and a review of the effect of music on psychological stress concluded that *'studies consistently report that exposure to music leads to a lowering of psychological stress'* (Biley 2000, p. 674). In this way then the control may have been acting as an intervention itself.

Other studies have also found little or no difference between two treatments (Sotsky et al, 1991) or interventions (Jain et. al.2007, Wolever *et al.* 2012). This emphasises the importance of including a wait list or no treatment control as well as a matched control, as also noted by other researchers (e.g. Fjorback *et al.* 2011; Marine et al 2006). Studies that have adopted this design have reported significant differences between interventions and no treatment/wait list controls, and much smaller differences, if any, between the intervention groups. One example of this is Jain et al (2007), previously mentioned in section 1.73, who found that mindfulness meditation and somatic relaxation both significantly reduced distress and improved mood compared with a no treatment control, but that mindfulness had a greater effect size than somatic relaxation for positive states of mind. Considering this then, may suggest that the positive difference observed between the groups in this present study may represent a robust finding.

The effect observed in this current study, on reducing depression is in keeping with other research with PMT. Dobbin *et al.*'s (2009) study investigated the treatment effect of PMT in a primary care setting, and found that depressed patients had a significant reduction in depression, as well as an increase in quality of life. Thompson (2010a) similarly found that PMT significantly reduced depression and anxiety in mental health referrals to Occupational Health. However both these studies differ from this current study in that they employed PMT as guided self-help within a clinical

population, rather than healthy volunteers, and neither managed to recruit adequate controls. Within workplace studies with healthy volunteers, many stress reduction programmes use group settings. One such study (Millear *et al.*, 2008) although using groups, had a similar focus as the present study, on promoting resilience and also used the same measure for depression, anxiety and stress (DASS). Comparison of this current study with Millear *et al.* (2008) results indicated a similar effect at 12 weeks, with a similar significant within intervention effect for depression (p< .01) and an absence of effect for anxiety. Millear *et al.* (2008) reported a significantly greater reduction in stress and increase in coping self-efficacy in the intervention group compared with the control group. However Millear et al (2008) was comparing an intervention of 11, one hour, weekly group sessions with a no treatment control recruited via the internet, and therefore the between group comparisons could be regarded as not adequately matched and, hence invalid. It is interesting to note the similarity of effect of these differently delivered resilience interventions. This concurs with other studies which have also found that self-care and face to face interventions can have statistically similar outcomes, e.g. Wolever *et al.* (2012) on yoga.

One of the factors this current study sought to investigate was resilience. Contrary to expectations, results showed that resilience did not significantly change over the study period. Resilience has been identified as a key factor in recovery from stress and depression, encompassing growth in personal resources, and maintaining healthy wellbeing (Bonanno, 2004, Fredrickson, 2003). Given this, it is surprising that resilience did not increase in this present study, especially considering that wellbeing did. There are a number of possible explanations why this may have occurred. Czabala's review of workplace mental health interventions reported that of their reviewed studies about half of the outcome variables showed a positive effect and that for those studies with participant numbers below 50 (20% of their sample studies) numbers may be too small to reflect significant differences (Czabala *et al*. 2011). Another reason for lack of significance in resilience, and some of the other outcome variables in this current study may also be due to the fact that this was a preventive study. Van der Klink *et al.* (2001) in their meta-analysis of interventions for work

related stress, found that remedial studies showed larger effect sizes compared with prevention studies (n=4, *d*=.59, *p*<.1) and (n=44, *d*=.32, *p*<.001) respectively.

It was hypothesised that any effect of PMT would increase during the intervention period (12 weeks) and be maintained at follow-up (26 weeks). ANCOVA analysis revealed that the effect of PMT on wellbeing, compared to the control group, was significant at 12 weeks and that this difference was not present at 26 weeks. A similar pattern was observed with depression score effect sizes. This reflects the duration of the intervention (12 weeks), and follow-up, after 14 weeks with no intervention, at 26 weeks. Grime (2004) reported a similar pattern in his RCT of computerised CBT in the workplace, with significant results not being maintained 3 months post intervention. However, had the participants been able to keep the intervention to boost it whenever they wished, it may have been that effects would have been sustained over time, as Marine *et al.* (2006) found that results from one study, with an intervention boost at two years, suggested a benefit for booster or maintenance interventions during follow up. Likewise, as with this current study, Grime (2004) reported a similarly high attrition rate resulting in low numbers for analysis. It may be that with a larger sample size differences may be observed at follow up (albeit, smaller than the initial rise).

Engagement with the intervention and control conditions was measured by participants keeping a tally of how often they listened to a recording. It was hypothesised that a higher degree of engagement with PMT would be correlated with improvements in mental health. As stated, analysis was conducted at 12 weeks as the study protocol demanded that the intervention and control materials were returned at this time. There was no statistical difference in the mean amount of listening between the control and intervention group. As predicted, analysis revealed that the number of times the intervention was listened to, had medium associations with improvements in wellbeing, mindfulness, total depression anxiety and stress score (DASS), personal efficacy and exhaustion. There were no significant correlations of number of times listened with changes in variable scores in the control group. These results support the findings in wellbeing (significantly higher in PMT group overall and at 12 weeks), and mindfulness (approaching being significantly higher in the PMT group compared to

the control group at 26 weeks) and with the depression subscale of the total DASS score (significantly higher in the PMT group overall and larger effect sizes at 12 weeks). Furthermore although exhaustion was lower in the control group at 26 weeks, this correlation result is consistent with results at 12 weeks. The medium personal efficacy correlation with listening in the PMT group is not supported by the other analyses and therefore must be viewed with caution. However it is reassuring that analysis of the PMT group revealed that exhaustion and cynicism levels did not increase in the PMT group, as it is important to establish that the intervention used in this way, i.e. as self-care with healthy volunteers, caused no harm.

This current study found that although more women entered this current study, they engaged less, compared with men. Studies have shown that although men and women experience the same level of work stressors, women experience higher levels of psychological distress and physical symptoms (Miller *et al* 2000). This may explain the differential in joining the study. However Soffer (2010) who studied gender roles and health promoting behaviours, reported that stress acts as a barrier to engaging in health promoting behaviours. He also noted that women participate in different types of health promotion activities compared with men. Women tend to focus on prevention orientation activities, such as eating breakfast, or sleeping for longer, whereas men partake in behaviours that could be seen as promotion orientation, such as exercise. The observation that women listened less than men, could then be explained by a combination of factors – stress acting as a barrier and/or the perceived orientation of the programme.

There was a high rate of attrition in this study, only 30% of participants completed questionnaires at all 4 time points. However there was a pattern of participants dipping in and out of the time points which resulted in approximately 50% of missing data. The pattern of attrition was unrelated to group allocation. The study design had assumed an attrition rate of 40%, based on previous workplace stress interventions (van der Klink *et al.* 2001), but failed to recruit the desired 200 participants. The rate of entry in this current study (5%) fell within those workplace programs reviewed by Goetzel and Ozminkowski (2008), who reported less than 1% enrolled into one offsite

programmes compared with 8% - 12% when offered onsite. In this present study, although offered onsite, the programme was carried out offsite, as it was listened to at home, and although easier to engage with at home compared to group attendance offsite, this may not be as easy or attractive as attending a class or group in work.

It is difficult to identify the determinants which accounted for this high attrition rate. Although high attrition rates are acknowledged as a threat to study validity (Goetzel & Ozminkowski, 2008), Murta *et al.* (2005) in their systematic review of occupational stress management programmes concluded that lack of process evaluation made it difficult to establish determinants of effective implementation. Hasson, Brown & Hasson (2010) reviewed self-help web based workplace stress management programmes and found that the strongest determinants of participation were being female, having no more than secondary education, exercising regularly and having positive expectations of reducing stress. This current study sought to maximise participation by following good practice for successful implementation, which recommends management briefing to enable 'buy-in' to the study (Murta *et al.* 2005).

The attrition rate and the corresponding high percentage of missing data is a limitation of this study. With 50% missing data imputing data has dubious value (Gayle, personal communication, October 2013) and so the study was perhaps underpowered. Future studies could recruit over a larger worksite and use more active management of questionnaire return, such as telephone follow-up. The remoteness of the CI was both a limitation and a strength. Having the prime researcher removed from the participants, due to ethical reasons, lessened any possible researcher bias, strengthening the robustness of the study, however a limitation was the absence of a key advocate, which has been identified as one of the factors for successful implementation (Murta *et al.* 2005). Research recruitment and questionnaire return were delivered through a research assistant, who although briefed and kept in close communication, was also employed in other tasks. Another study limitation is that the participants were volunteers, and therefore represented a motivated cohort of employees, thereby limiting the generalizability of this present study to all groups.

Our findings are consistent with those of other mind-body workplace stress management and wellbeing programmes in showing promise as health promotion interventions. The study contributes to the field of workplace health promotion interventions by illustrating the potential mental health benefits of a novel self-help audio programme for self-selected healthy volunteers. The study shows that the workplace is a suitable place for this type of intervention, and highlights the challenges of implementing a rigorous experimental design in a real life setting. Additionally this study adds to the growing research base on wellbeing in the workplace, and showed that those who self-refer are not the worried well but a group who had accurately identified that they could benefit from relaxation and stress management techniques.

In conclusion then, this study shows that Positive Mental Training holds promise as a low cost health promotion resilience and wellbeing programme for the workplace. The results suggest that the programme appears acceptable and is not harmful, and leads to benefits in mental health and wellbeing. Furthermore there is an indication that the programme may be better suited to men, in that women employees may need additional support to help them maintain engagement with this self-help programme. Given the concern for mental health generally, not only in the workplace, the addition of a self-help, cost-effective intervention, is of potentially great value to workplaces and to the UK population in general.

Study 2

Individual experiences of participating in a workplace health intervention study

6 Introduction

One of the criticism of RCTs and quantitative methodology, as conducted in Study 1, is the narrow focus on predetermined variables can restricts the areas of investigation, by limiting the inductive nature of enquiry. This excludes participants' subjective experiences and interpretations not reflected in those variables, which can be a valuable source of understandings. Additionally it may be that this approach may give an unrealistic validity and reliability to measures which may be limited in what they are measuring (Blumer, 1969).

To addresses these criticisms and limitation a qualitative methodology was also used in the study design of '*Promoting Health & Wellbeing in a Working Population'*, Bringing in this approach allows for developmental enquiry to investigate the process of the intervention (Bryman, 2001). This is important in evaluation of complex interventions where there are many factors which can impact on the outcome (MRC, 2000). Understanding *why* something has an impact, i.e. the process, can be as informative as measuring the size of the impact and this type of question is consistent within the health promotion ethos (Oakley, 2001). In this current study, motivation to listen was investigated as an indicator of process evaluation. An intervention cannot be expected to have any impact unless it is taken up. Therefore this study sought to gain insight into the reasons why participants listened to the intervention, what they hoped to gain, what factors facilitated or inhibited their engagement.

Qualitative question 1

> 1. *What motivates participants to listen to the programme?*

Qualitative methodology can capture aspects of the intervention which are not accessed using only the experimental approach (Blaikie, 2006, Glasner, 1992). Qualitative methodology takes account of participants' subjective experiences, participants' perceptions and interpretations (Glasner, 1992). These are a valuable source of data and can develop new insights from an 'insider' view of the world (Oakley, 2001). Therefore as an evaluation of an intervention, participants were asked about their interpretation and experience of any consequences of listening to the programme, what they perceived they actually gained.

Qualitative Question 2

> 2. *What are the perceived benefits of the programme?*

Additionally and importantly in order to capture any negative consequences of listening, participants were asked about their perceived limitations. Enquiring about any negative impact also helped ensure a non-biased account of listening to the intervention.

Qualitative Question 3

> 3. *What are the perceived limitations of the programme?*

Individual semi-structured interviews were chosen as the method as they are appropriate for the sensitive nature of mental health and wellbeing in the workplace setting, where participants may be able to express views unhindered by concern of colleagues (Gomm, 2004) .

Interviewees were drawn from both the experimental (PMT) and control (music) groups of Study 1. Drawing on participants from both groups allows for a deeper exploration of individual motivation and engagement as it explores themes common to both groups. Contrasting and comparing is part of the grounded approach, adopted here, and in this way differences and similarities between groups and individuals can

help to further elucidate themes and the emergence of richer understandings relating to motivations and limitations. Comparing and contrasting can also be applied to participants' experiences of programme gains and benefits, although caution has to be exercised as to the generalisability of these comparisons. Both groups were exposed to an intervention, one to PMT and the other to an active control, listening to music, therefore including participants from each group allows for exploration of similarities of experience in benefits of interventions in general, and highlights the differences between the interventions.

6.1 Ethical Considerations

Ethical approval was granted for this study by both the Lothian Research Ethics Committee (Appendix 3.1) and University of Edinburgh, Department of Clinical Psychology Ethics Committee (Appendix 3.2). The following ethical concerns for this qualitative aspect of the study were considered and satisfactorily addressed along with the quantitative methods discussed in Ethics 2.1, by the following:

6.1.1 Removing Personal Interest

The personal interests of the Chief Investigator (CI), who is a director and shareholder of Positive Rewards Ltd, the company which produced the intervention programme (Positive Mental Training) were acknowledged. In order to diminish the opportunity for bias and ensure transparency the following features were incorporated into the study design.

I.   Independent interviewer

The potential for bias in interview was recognised by the Chief Investigator (C.I.), and to ensure transparency, the C.I. did not have any interaction with the participants who were interviewed. Interviews were conducted by an experienced independent researcher.

The C.I. had concerns about the collection of data, by proxy, through an independent interviewer. There may have been non-verbal communication and understandings between the interviewee and interviewer which would not be apparent in the transcription. However it was considered that the benefits of minimising bias by using an independent interviewer outweighed these concerns, which were addressed by good communication between the C I. and the interviewer, and the audio recordings. Additionally having the interviews conducted by another, made the C.I. be mindful of the iterative process, making it explicit.

II. Independent transcription

An independent agent was employed to transcribe the audio recordings. In this way the C.I. had no contact with raw data and only when data collection was completed, did the C.I. have access to the data for analysis and interpretation.

III. Independent analysis

To further reduce any possible bias in interpretation, emerging codes and themes were reviewed by an experienced, independent, qualitative researcher. Resulting understandings and construals were then compared and discussed. This increased the credibility and reliability of findings and minimised any potential bias in interpretation by the C.I. (Silverman, 1993).

6.1.2 Minimising interviewer and interviewee bias

The interview is a dynamic process between interviewer and interviewee. A potential source of bias is that the interviewee could be led, perhaps unintentionally, by the interviewer. This was addressed by using an experienced independent interviewer and also with the use of a semi-structured interview schedule. This maximised reliability of data collection through enabling consistency in interview (Silverman 1993).

6.1.3 Safeguarding Participants

I. Participants were fully informed about the interview process in a letter (see Appendix 3.3) and given time to reflect on this, as well as the opportunity to ask the research administrator questions, prior to giving consent to interview.

II. Confidentiality

Participant confidentiality at interview was assured, by the following:

a. Interviews were conducted on a one to one basis, whereas in a group situation this would have been more problematic.

b. Participants were offered a choice of interview location. This gave the opportunity for anonymity from work colleagues as interviews could be conducted away from the participant's usual place of work, although still within NSS premises (for reasons of interviewer safety, interviews could not be conducted in the participant's home).

c. Confidentiality and anonymity in reporting were assured by making all quotes from the data anonymous.

7 Method

7.1 Independent Interviewer

An experienced, independent interviewer was required to carry out the interviews. Criterion for recruitment of the interviewer was experience in qualitative interview within the health field, to ensure reliability of data collection. Reliability refers to degree of consistency between the interviews, and this is increased by using the same interviewer for each interview. Also an experienced interviewer will maintain uniformity between interviews (Silverman, 1993). The person selected met this criterion having extensive experience of interviews within the health and social science field. She was an active researcher who was highly recommended and used by an established local research agency. Her curriculum vitae is attached in Appendix 3.4 The Chief Investigator met with and briefed this independent interviewer and maintained contact, through email and telephone, during the data collection process. This allowed the interviewer's concerns to be addressed and theoretical analysis to be fed back, such as is detailed below, in section Iterative Process.

7.2 Independent Transcription

An experienced independent transcriber was recruited to transcribe the audio recordings. This was to maintain the transparency of the process and to remove any bias which may have been brought in by the C.I. Additionally the transcriber was familiar, due to previous work, with the interviewer's voice, which facilitated transcription.

Transcriptions were checked for accuracy with the audio recordings by the C.I.

7.3 **Participant Recruitment**

Participants were drawn from the sample who took part in the earlier intervention study, Study 1, as described in 3.1.4.

Participants were recruited for interview in the time period September – December 2009, which was between completion of the week 12 questionnaires and week 26 questionnaires. This allowed participants time to complete the programme and still be within the study period.

All participants who returned their week 12 questionnaires were invited by letter (see Appendix 3.3) and/or email for interview and those willing to be interviewed contacted the research administrator.

Interviewees were purposively selected, alternating between intervention or control groups, in a sequential manner, until data saturation had been achieved. There was no recruitment stratification on any other criteria.

Interviews were arranged, between the interviewer and interviewee, at a mutually convenient time and location and took place during work time in work premises. Participants were offered the choice of being interviewed in a suitable room at either their place of work or, if preferred, in a suitable room in a different NSS building. Participants were required to sign a specific interview consent form (see Appendix 3.5) prior to interview. Interviews were audio recorded and lasted between 30 – 45 minutes.

The participant interview process is illustrated below, in Figure 7:1: Flowchart of Participant Recruitment and Interview Process
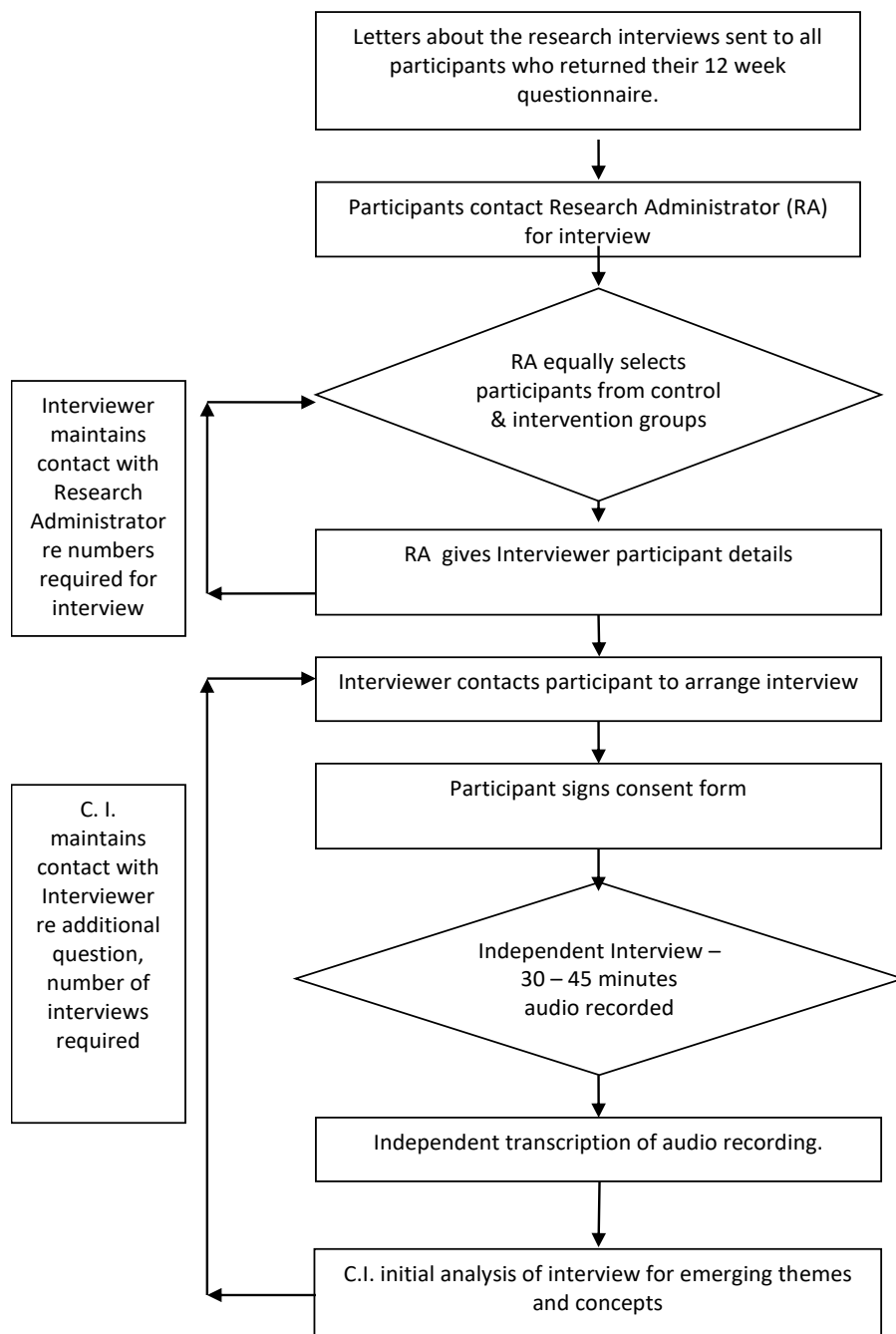
Figure 7:1 Flowchart of Participant Recruitment and Interview Process

7.4 **Interview Schedule**

The interviewer conducted the interview around a semi-structured interview schedule to maintain reliability in elucidating answers to the 3 main research questions (Silverman, 1993). These questions were:

1. What motivates the participants to listen to the programme?
2. What are the participants' perceived benefits of the programme?
3. What are the participants' perceived limitations of the programme?

These questions were designed to complement the previous study, Study 1 by exploring the process of engagement with the intervention and also by elucidating participants' experiences in a manner not captured by the quantitative questionnaires used in study 1. They were drawn from the relevant literature, (Dobbin *et al.* 2009, Philips *et al.* 1994, Blaikie, 2006, MRC, 2000, Murta *et al.* 2007) and from the C.I.'s own experience of the intervention.

The interview schedule was built on, using open questions to allow the participants flexibility and freedom to express their own views, unhindered by any of the interviewer's preconceptions and to facilitate as much data capture as possible. In interview participants were not asked specifically about a topic unless it was first mentioned by that participant. The interview questions are listed in Appendix 3.6

7.4.1 **Iterative Process**

The grounded theory approach is an iterative one, where analysis is used to inform data collection (discussed further in section below). Accordingly then, this process yielded additions to the interview schedule to check out emergent themes. These are documented in the Appendix 3.7.

7.5 **Interview Analysis**

A grounded theory approach was adopted (Strauss & Corbin, 1990, Charmaz, 2006). In this method, emerging themes and concepts from analysis of data are used to inform data collection, and this process continues until theoretical saturation has occurred, i.e. no new themes or concepts are derived from the data. In this process data is analysed through reviewing transcripts of the interviews and coding relevant parts into indicators of concepts. This is a fluid process which is continually reviewed and checked against emerging data and can be thought of as comprising of 3 stages (Strauss & Corbin, 1990); 1. open or initial coding which breaks down the data to generate concepts and categories; 2. axial or focused coding to build together categories and; 3. selective coding to select the core codes or themes, i.e. the central issues round which the categories fit to bring together a theory grounded in the research.

Initial Coding   *Focused Coding*   *Categories & themes*   *Theories*
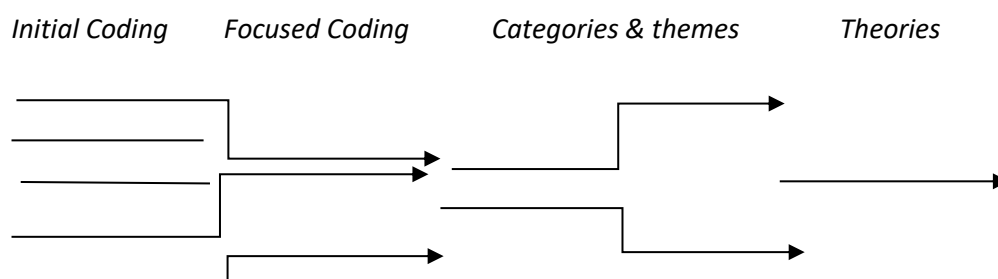
Figure 7:2 Schematic Representation of Qualitative Process

7.6 **Analytical process**

The interviews and transcriptions were conducted between September – December 2009. Interviews were analysed by the C.I. according to the method outlined by (Charmaz, 2006) and using NVivo 9 software and manually. Initially the interviews were listened to repeatedly, to gain a preliminary understanding of the broad themes emerging in answers to questions. This process allowed the C.I. to become familiar with the interviews, the tone of voice and expression of the interviewees.

Analysis began with deep initial coding, line by line, or, statement by statement, using codes developed from the researcher's own substantive definitions of what was meant or, where practical, in-vivo codes i.e. codes from the participants own language. This approach encouraged the researcher (C.I.) to gain distance from her own preconceptions and also from the participants' own assumptions and interpretations, helping new light to be shed on the material, so that the researcher can make '*fundamental processes explicit, render hidden assumptions visible.'* (Charmaz, 2006 p. 55)

From these initial codes were drawn focused codes, developed from those initial codes which occurred most frequently and those which seemed to make most analytical sense to the researcher for categorising the data. These focused codes were then compared within and between participants looking at the similarities and the differences that emerged. From this, categories and themes were developed and theories were drawn from these. Examples of samples of coding and thematic development are shown in Appendix 4.

7.6.1 Role of the C.I. as researcher/practitioner

The C.I. analysed the data and for this adopted an interpretativist stance. Analysis in this manner relies on using the subjective understandings of the researcher, and so, encompasses the experiences and biases of the researcher. This is consistent with a constructionist view within grounded theory, as oppose to a 'purer' Glasner & Strauss perspective which would demand attempting to remove all influence of self in the interpretation of data.

In this study the researcher, the C.I., had the experience of being a practitioner, of using the programme in a therapeutic setting. Whilst this background experience may have formed a broad understanding of the issues around using the programme, the analysis was grounded in the data and was subjected to the robustness of the detailed grounded theory methodology, with biases in interpretation being reduced through, the

process of coding and cross referencing themes in different participant's accounts, providing external consistency and validation.

7.6.2 Ensuring quality

The question of how to ensure quality in qualitative research is important and accordingly a number of methods have been developed to address issues of validity and reliability. Seale & Silverman, (1997) recommend five strategies that include using supporting generalisations with 'quasi statistics', i.e. counts to help the reader assess how widespread and representative generalisations are; data validating through comparison of similar and importantly deviant cases; recording data objectively with audio or video equipment; ensuring representative through random or theoretical sampling or a mixed methods approach and finally that the use of computer software can help ensure systematic analysis of the data. Some researchers prefer less positivists terminology, e.g. Guba (1981) suggests using credibility, transferability, dependability and confirmability (in preference to internal validity, generalisabilty, reliability and objectivity. There are a range of generic strategies that can be adopted to address these. Credibility, can be further enhanced, for example, by using well established methods, iterative questioning, use of a reflective commentary, experienced researcher, participant checks and peer scrutiny. Transferability can be increased by detailing the context of the study, and dependability through a detailed description of the process of the study. Confirmability is concerned with the researcher's objectivity and can be enabled with triangulation and the researcher's reflective commentary, or diary (Shenton 2004).

Accordingly in this current study a number of strategies were put in place to help ensure the quality of the study. An experienced researcher conducted the interviews to help counter interview bias. (Ovretveit, 1998). (see section 7.1), the interviews were audio recorded, aiding objectivity, an established method, i.e. grounded theory was used, and data analysis was subject to peer scrutiny to increase credibility. Additionally the CI kept a reflective account of the process, a research diary.

7.6.2.1 The research diary

A research diary was kept during the process of analysis which charted the C.I's progression of ideas and nature of enquiry. This process caused the CI to reflect on and consider the analysis. This aided objectivity of data interpretation through making more explicit any observer biases. Consideration of self as a researcher is a prerequisite for sound research and helps to remove the biases of subjectivity. Lofland (1984) identified basic considerations to use in the evaluation of one's own perceptions and the participants' perceptions. These were reflected upon during analysis and involved considering whether the individual's reports were their own experience, whether there was any reason a participant may be saying what he/she thought the interviewer wanted to hear, were the accounts internally consistent, did they seem like a truthful account? Additional keeping a research diary increased the CI's reflexivity through explicitly acknowledging implicit values and beliefs and consciously acknowledging and challenging personal assumptions. An example of this can be seen in an extract from the research diary when the CI realised she recognised an interviewee's voice.

> *This is X. What does she think? What do I think of her? What assumptions am I making here? How do I feel listening to this? How does what I know about her affect my interpretation?. Is my bias affecting my interpretation of this data? My relationship with her may cloud my interpretation. I must revisit the transcripts later Take care - stand back -be objective*

Through continually revisiting the data and subjecting it to fresh enquiry and from being aware of both the insider participant view and the external observer view, the C.I. was able to remove, as far as possible, the inherent biases of qualitative research.

Additionally biases in interpretation were reduced through the process of coding and cross referencing themes in different participant's accounts, providing external consistency and validation.

8 Results of Study 2

This chapter will first describe the participants and their reported levels of engagement with the interventions. There will then follow an outline of the themes and subthemes that emerged from the analysis, which will then be described in detail. The chapter will conclude with a consideration of overlap of themes, the conceptual framework and a summary.

8.1 Interviewees

Eleven participants were interviewed; six from the Verbal Relaxation Training Group (VRT) and five from the Music Relaxation Training Group (MRT). Their demographic data is displayed in Table 8.1: Characteristics of Participants who were interviewed, along with the participants reported degree of engagement with the programme, expressed as 'amount of programme listened to'. No further demographic data is displayed to protect interviewee anonymity.

Table 8:1 Characteristics of Participants who were interviewed

Group	Participant Interview no	Gender	Age	Amount of programme Listened to
Verbal Relaxation Training	1	m	40	complete
	2	f	44	complete
	3	m	30	complete
	4	m	51	complete
	5	f	46	a little
	6	f	45	about half
Music Relaxation Training	7	m	35	complete
	8	f	39	complete
	9	f	45	A few times
	10	f	50	Not at all
	11	f	46	A few times

8.2 Interviewee Engagement with the Programme

In the MRT group; one participant reported that she did not engage with the programme at all, two participants described they really hated the music and so listened only a very few times; one female participant described how she worked hard to complete it but was disappointed at the results; and one male participant stated he did complete it, enjoyed it and described very good personal gains.

In the VRT group; three participants completed it (2 male, 1 female) and described good personal gains; one male participant listened to most of it and also reported benefits from this; two female participants described listening to some of it, mainly CD1 and much less of CD2 and CD3, one of whom stated she stopped listening as she was also undergoing CBT and the other interviewee said she felt she had the skills already and was not getting much out of the programme nor enjoying it.

8.3 Main Themes

This section outlines the themes that emerged in relation to the three research questions, which were; what motivated the participants to listen to the programme; what were the participants' perceived benefits of the programme and what were the participants' perceived limitations of the programme.

Within the each of the main themes of motivation, benefits and limitations, several subthemes were identified from analysis of the data, explaining the factors behind the individuals' engagement and their experience of the programme, as they related to these main themes. These are illustrated in Figure 8:1: Diagrammatic representation of themes and subthemes of factors that influence listening.
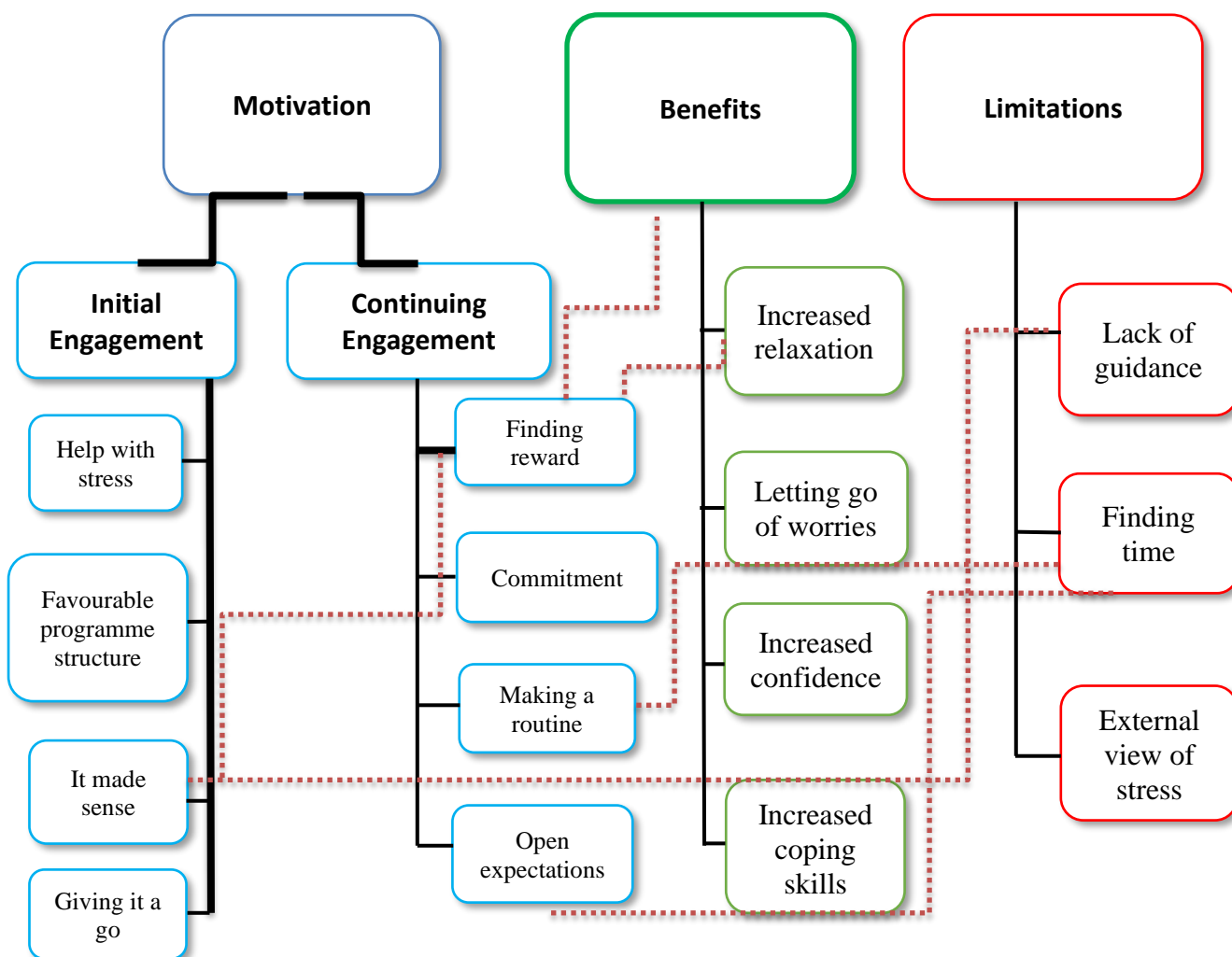
Figure 8:1 Diagrammatic representation of themes and subthemes of factors that influence listening; with dotted line (---) representing linking themes.

As can be seen from Figure 8:1: Diagrammatic representation of themes and subthemes of factors that influence listening, two subthemes emerged from the main 'Motivation' theme –'Initial Engagement' and 'Continuing Engagement'. A further four subthemes were identified as relating to factors which initial listening – 'Help With Stress', 'Favourable Programme Structure', 'It Made Sense' and 'Giving It a Go'. Four subthemes emerged within the 'Continuing Engagement' theme. These were 'Finding Reward', 'Commitment', 'Making a Routine' and 'Open Expectations'. Within the main 'Benefits' theme, four subthemes were identified from the

participants' data, which were, 'Increased Relaxation', 'Letting Go of Worries', 'Increased Confidence' and 'Increased Coping Skills'. Similarly within the main theme of 'Limitations', three subthemes were identified – which were 'Lack of Guidance', 'Finding Time' and 'External View of Stress'. The dotted lines represent links between themes. These themes, subthemes and linkages will now be described in detail in the following sections.

8.4 Motivation

The themes and subthemes which were identified from the participants' data, in relation to the main theme of 'Motivation', will now be described.

8.4.1 Initial Engagement

Initial engagement to listen to the programme emerged from the participants' reports as a theme and was found to contain four subthemes – 'Help With Stress', 'Favourable Programme Structure', 'It Made Sense' and 'Giving It A Go'.

8.4.1.1 Help with Stress

Most participants reported that they had entered the study due to personal experiences of stress at work, home or both and were looking for help to cope better with stress and to feel better.

> *'I do have a stressful job, I thought if it could help why not'. P7 Male MRT*

> *'because I had been through a period of stress and depression myself and that's why I sort of said "oh I might like to do this"'. P6 Female VRT*

> *'The motivation was because I had been feeling very, very unwell and I was really, really beside myself with tiredness and I thought `this is about stress' P9 Female MRT*

> *' there's certain times when you can get a bit stressed and I've noticed it with me sometimes, sometimes at work, sometimes at home and not in a regular thing but you know …I wasn't thinking you know "I need some help" P3 Male VRT*

> *'so I felt like "ok I'm going to explode and maybe I need some help' P2 Female VRT*

8.4.1.2 Favourable Programme Structure

Participant reports revealed that there were several aspects of the structure of the self-help programme that were appealing. These were - training the mind to deal better with stress, having a structured programme and the anonymity of the programme, as it would then feel that it was more on his/her own terms.

> *.. . the idea of sort of training the mind..it appealed to me'. P3 Male VRT*

> *'.and I thought `well something that's going to make you do this every night as opposed to just on a whim when you feel like it' I thought would be quite good so that was .. and I thought `well if you're doing that every night and that's a relaxing thing every night maybe that will help 'P9 Female MRT*

> *" like normally I was thinking "I can manage myself"..I had this chance I could try, it was anonymous and it was on my terms...' P2 Female VRT*

8.4.1.3 It Made Sense

The theme 'It Made Sense' emerged from participants' interviews as also being relevant to initial engagement. Making sense of the intervention meant that the individual was able to understand what the purpose of the programme was and how it may have worked – a cognitive framework.

Making sense of the programme appeared to be done in relation to participants' previous experiences of alternative therapies. In particular, those from the Eastern traditions such as tai chi and yoga, which focus on mind/body interaction, particularly breathing, and are less analytic than the more Western approaches such as CBT.

> *'I'm quite interested in the area in general I would say and you know my own experience I suppose .....I do believe that you know doing things like this can help, I think that's what motivated me to have a go.' P1 Male VRT*

> *'It reminded, yeah it reminded me when I was going through the change at ...and I was stressed,.... I had heard a similar type CD by Jack Black, so I had listened to that, that was quite similar in many ways and just the thought processes and the relaxation and things like that that he used, it did remind me a bit of that .' P4 Male VRT.*

Initial analysis of the first three interviews indicated that previous experience of alternative therapies was a common reference. Accordingly, a question was added to the interview schedule to explore this further and it transpired that most participants (all but one) had some experience with alternative therapies. This may represent a selection bias for those entering the study; that this type of programme was attractive to those with previous experience of alternative therapies, perhaps because it fitted in with their beliefs, experiences and understandings.

> *Interviewer: Yes. Have you experienced any other sort of similar projects or programmes or ….*
>
> *No but I'm quite interested in alternative things and I've done like breathing workshops … for Tai Chi' P9 female MRT*
>
> *'I've tried other things before …I've tried all you know the relaxing music and the chill out CD's and that kind of stuff' P5 Female VRT*

The 'It Made Sense' theme also influenced continuing engagement as participants expressed a sense of frustration when the programme did not make sense, highlighting the importance of this theme. Accordingly, this theme is also linked to the 'Limitations' theme, described later. Without any obvious meaning, listening to the MRT was reported to be *'a chore'*. Participants described a sense of bewilderment at not being able to understand the process, why the music was chosen.

> *'I don't understand if it (the music) was chosen specifically because you weren't supposed to like the music or be concentrating on the music or I don't know why the music was chosen' P9 Female MRT*

Lacking information, one participant described how she tried to make sense of her experience with the programme herself, attempting to understand why that specific music had been chosen it, wondering if it was linked to heart beats.

> *'it didn't ring true to me'..' I kept thinking `why' and I thought .. and I think there was repeats, I started thinking `I must try and see if I recognise any of these riffs' … I thought I wonder if that's been put in to try and sort of mimic something about heartbeat or rhythm's or something ..' P11 Female MRT*

There was deliberately very little information provided with the interventions (both MRT & VRT), to reduce participant bias, and this was particularly challenging for those who had the MRT as these recordings had no spoken words on the CDs, only music, and therefore less explanation of the process. Some MRT group participants reported strongly disliking the music. It may be that irritation at the lack of understanding which may have intensified the feelings of dislike of the music. This aspect is captured in the 'Lack of Guidance' theme under the main theme 'Limitations', described later in Section 8.6.

8.4.1.4 Giving It a Go

The theme of 'Giving It a Go' also emerged from the participants' data as influencing initial engagement to the programme. This theme describes the opportunistic element expressed by some participants; that as the intervention was easily available at work, with no financial costs and although they were not actively looking for self-help, they decided to take the presenting opportunity to try it – to give it a go.

> *'I always think oh it's a good opportunity to help or if it didn't cost me anything' P10, Female MRT*

> *'I wasn't actually looking for something but I had read bits and pieces...and I thought `well this is free so I'll have a go at something like that'. P3 male VRT*

This theme also reflects a sense of openness to experience.

> *'I'm always open to things' P8 Female MRT*

> *'I'm up for anything, anything that might be positive I'll give it a go and especially if it's free.. it's costing you a bit of time that's all, so that's why' P11 Female MRT*

It may be that this was a selection bias, as the fact that only a little information was given on the interventions (to minimise bias) may have been more acceptable to open minded people.

8.4.2 Continuing Engagement

There were four subthemes identified from the interview data that influenced continuing engagement. These were 'Finding Reward', 'Commitment', 'Making a Routine', and 'Open Expectations'. These will be described here.

8.4.2.1 Finding Reward

Having some pleasurable gain, a sense of reward for listening, or enjoying listening, emerged from the participants' interviews as being an important part of continuing to listen. One participant expressed this as being similar to being given a sweet, as a reward to keep her going (as she reported she had not enjoyed the MRT).

> *'It's like wanting a sweetie with it you know' P9 Female MRT*

And another expressed the idea of reward (from relaxation) driving the desire to continue listening.

> *'I think maybe that's why .. maybe that's why I've learned it (relaxation) because you know it works .. if you get the reward very quickly after doing something then you're going back to it more often so yes it's good.' P2 Female VRT*

This latter quote also highlights the speed at which the reward was gained by the participant. When a reward was described as being quickly achieved then this was a motivating factor. Conversely when a reward was slow to be achieved this was not motivating and those participants reported using other sources of motivation to keep going, such as commitment, describe in the next section, 8.4.2.2, under the theme 'Commitment'.

Some participants described experiencing other rewards from listening, such as finding the music and voice pleasant.

> *'I thought that (the background music) was fine yeah, mind I thought the voice was very … the voice was good as well. The music was … was it like .. I can't remember what it was, yeah but it was fine.' P3 Male VRT*

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'I particularly liked the Dorian Mode guitar music' P4 Male VRT

The theme of 'Finding Reward' is closely linked to the main theme 'Benefits' which contains themes relating to the specific advantageous effects of listening to the programme, described in Section 8.5

The importance of finding reward in facilitating continuing engagement was highlighted by the participant reports of having difficulty in listening when this was not an enjoyable experience, and there was an absence of rewards. This was particularly strongly expressed by some participants who were in the MRT group, who reported really disliking the music and described the negative impact this had on listening, for example saying listening became 'a *duty to get through'*, and that there was not enough motivation when the music was disliked.

> *'I was thinking `I really hate it (the music) , I really, really dislike it' and it really ….. it was a duty to get through.*
>
> ***Interviewer: Right and it didn't improve as time went on?***
>
> *If anything it got worse ' P11 Female MRT*

> *'I'm not motivated enough if the music is not good enough, it's not enough motivation to think that this should be done in spite of the fact I don't like the music' P9 Female MRT*

Another participant also reported not enjoying listening and explained this as the fact she felt she already had the techniques the programme was implementing.

> *'.the more I got into it the more I wasn't really enjoying it .. . it was just looking at different ways to cope with different things which I think I was probably implementing anyway.' P5 Female VRT*

8.4.2.2 Commitment

Having 'Commitment' (to the project) was a theme relating to Continuing Engagement to listen that was expressed by those in the MRT group. Some participants described a sense of being determined to carry on, to finish the programme.

'Yeah it's more (than noticing any benefit) that I just wanted to finish it and it wasn't until about the second month when I thought `oh wow' you know when I realised actually I was actually enjoying the bus trip to work whereas before it was like `oh god getting on the bus' it's my time of day coming to work and coming back to work so.' P7 Male MRT

And

'I didn't find it that relaxing to begin with I have to say but decided to persevere with it and I did find it more relaxing as I, you know continued..

Interviewer: *' How long did it take you to get used to the sort of music?'*

'I would say it took me to the second tape, you know the whole first few weeks I found it slightly a bit of a chore but I was determined to carry on with it.'P8 Female MRT

These participants described not being aware of any benefit of listening until later on, into the second month. This is in contrast to those who reported noticing benefits early on in listening. It may be that lacking any early benefit (reward) from listening, those participants had to find another source of motivation to continue listening, and found this from fulfilling their commitment to the research programme.

Other participants described how their sense of commitment to the study provided some motivation to try to continue listening, but this was not sufficient to overcome their dislike of the music.

'I felt guilty so I put it back on again at the end and I thought `it's no any better' and I listened to it maybe about two or three times and I thought `I can't do this' ...

..it does involve time and you have to be quite committed and I would only have done it if I had really, really liked it '' P9 Female MRT

' Every time I tried, I tried when I got a new (CD) ....cause I thought `well I must at least listen to it because it's not fair cause work has gone into this and I must you know try and start a fresh' but at the end I was just a raving lunatic with it, I just couldn't.' P11 Female MRT

Conversely, in one case, a sense of commitment to the research project was reported as inhibiting engagement. This participant stated she never actually listened to the CDs as she was waiting for the right moment, to be fair on the research project.

> ' I should have (listened to the CDs) .. I was keen to participate in this study, well I think any research study people are looking for volunteers... I had so much pressure at work and I felt that I shouldn't participate because it would give the wrong view because I wasn't usually under that type of stress and it didn't seem the normal type of situation for me, . .. there was lots of change on-going at work and a lot of pressure and I just felt okay you know `I'll do it, I'll start next week or something' and I didn't get to. ' P10 Female MRT

8.4.2.3 Making a routine

Participants identified making a routine as a helpful aspect of continuing motivation to listen to the programme, through making it easier to make time to listen to the intervention. One participant, who listened to it all, simply described listening as easier to manage when it was part of a routine.

> ' it is easier to manage when it was part of a routine'. P5 Female VRT

The four male participants who were interviewed all made listening to the intervention a routine activity and listened over the whole study period. These men stated they were able to make or find the necessary time to develop a routine, such as taking a specific time each day to listen to the recording.

> 'I did make a point, because I'd, to listen to it, you know, I tried to listen to it every night and I'd just take the time, half an hour right before I go to bed to sleep....and I'd say "right I'm going away through"' P4 Male VRT

And

> **Interviewer: 'Did you always remember to listen to it?'**
>
> ' Yeah, because what I did, I just did it every night as I went to bed so that was the way I did it' P3 Male VRT

In contrast, six of the seven female interviewees described struggling to establish a routine, often saying they were busy, having conflicting interests and things to do; finding it more difficult to focus the mind to follow the CDs.

> **Interviewer: 'Did you find it quite straightforward the sort of process of getting into a routine?**
>
> ' no, that was the problem......even although it's actually quite relaxing once you get into.' P6 Female VRT

However, one female participant, who had MRT, described being able to develop a routine but only listening to the intervention a couple of times as she hated it, demonstrating that having a routine was not sufficient to facilitate listening if the content was disliked.

> **Interviewer: 'How easy was it to fit it into your routine?**
>
> ' oh it was actually alright..it's like everything you go home and you do your stuff and you think 'oh I'm going to go to bed now' and you think 'oh will I do that or will I not ' but it wasn't a long time that was required of you so I had....I put the CD by my bed and I just put it off when my time was finished and so it wasn't really a big deal and if I had got nice music I probably would have done it for the 12 weeks.' 'I hated the music, I hated it.' P9 Female MRT

One participant described how finding time to listen was easier during week when he had a routine, but harder at the weekend as he was out of his routine, despite having more time.

> 'the bus trip into work ...so during the week I managed to do it just about every day for the whole time then it was on the week-end that I'd be lying if I said I got to it every day at the week-end.....well it was just out of my routine and so on the week-ends.. there was no set time when I could just sort of sit and listen and so I probably had more time to sit and listen on the week-end but it was easier to manage when it was part of a routine.' P7 Male MRT

Most listeners described experimenting with finding the right time to listen in order to find the best conditions for creating a good listening environment. Headphones were reported to have helped with this.

*' I would take myself away in to the bedroom and just lie on the bed and play it....
That was the best time, basically it was before going to bed for the night or I would
go after my meal at night and then I would come back through.*

***Interviewer: Did you listen to it with earphones or just straight from the CD
player?***

Eh yeah it was earphones.' P4 Male VRT

Where headphones were not used, shutting out noises from the outside world was
described as difficult because the outside noises were distracting.

*'....because I was listening, I wasn't listening on my head phones ... I was listening
from my computer so it was very hard to switch off from the noises around the house,
in the street and all that and then keep my mind focused on this what is on the tape...
'P2 Female VRT*

8.4.2.4 Open Expectations

'Open Expectations' was a theme that was revealed on interview analysis that also
influenced continuing engagement with listening. Participants who expressed their
expectations of the interventions in open, non-specific terms, such as finding ways to
deal with existing stress, also reported greater engagement with the programme.

*'just to sort of help you handle things a bit better and relax a wee bit, maybe things
like that.' P3 Male VRT*

*'I didn't have any preconceived ideas, you know I didn't think of its going to be like
this and find it didn't quite you know match up to that so I didn't really have that
feeling' P1 Male VRT*

This later quote draws attention to the idea of 'matching up' expectations with
outcomes, and that if there is no specific expectation, then this may be helpful in
engagement. However some participants reported having specific expectations of what
they hoped to gain. One participant described managing a mismatch with expectations
by re-adjusting his expectations.

> *'I mean it was a bit disconcerting at first because I didn't know that it was just going to be music so I think I kind of expected something else to happen..... You know I was waiting for someone to say something so it was just like `oh alright nothing is happening' and then...It was like `okay so maybe it's all going to be music' and then I kind of got used to it...' P7 Male MRT*

In contrast, participants who described having specific expectations, expressed disappointment with the interventions, when these were not met. For example one participant, who had received MRT, reported hoping for help with sleeping and letting go of worries, expressed disappointment that this had not happened.

> *'I would say that I think I got less out of it than I thought I would when I agreed to do it and perhaps I was expecting this miracle, `I'm going to feel wonderful' and I .. it was relaxing, I did benefit from it but I don't think I got as much out of it as I thought I might.*
>
> ***T: Is there anything you'd have liked to have got out of the programme but feel you did not? Can you put it into words?***
>
> *'Em, probably a good night's sleep and probably being able to switch off when I left work a bit more and I haven't been able to do that...' P8 Female MRT*

Similarly another participant reported expecting 12 weeks of relaxation and expressed being rather disappointed by the self confidence building aspects of the VRT and unsure of their benefits.

> *I was thinking it was more about the relaxation so I thought you know 12 weeks of practising the relaxation that will kind of bring you to the level so I was a little bit disappointed that you know that they have this bits of this self (confidence) … but I think maybe it was helpful for other people and you know I'm saying it didn't bring me anything but maybe it did, maybe I just don't know that' P2 Female VRT*

These latter two participants, had also described finding it hard to complete the programme, linking this theme to the 'Finding Rewards' theme.

8.4.3 Summary of the main theme Motivation

Personal characteristics and experiences emerged from the data that were found to influence motivation to listen to the programme. These were found to relate to either 'Initial Engagement' or 'Continuing Engagement'.

'Initial Engagement' was reported by many participants to come from a recognised need for help in managing stress. However some participants expressed taking part because the programme was there, they were able to 'Give It a Go'. Additionally being willing to engage in this type of programme may appeal to those with previous experience of alternative therapies, as the fact that 'It Made Sense' was a common theme reported amongst interviewees and this may have made it easier to fit the programme into their belief systems. Having a 'Favourable Programme Structure', e.g. daily listening, anonymous self-help, was also a theme that increased the programme's appeal for some participants, thereby enabling initial engagement.

'Continuing Engagement' with the programme was found to be facilitated by 'Finding Reward' and if reward was slow to be realised, then other motivations were used such as 'Commitment'. However Commitment to the research project could also be an inhibiting factor if there was a sense of needing to fulfil the role of a research subject. Other facilitating themes that emerged from the interview data were 'Making a Routine' and having 'Open Expectations', i.e. having no specific expectations. This latter theme was highlighted by those who expressed specific expectations also reporting finding less benefit and having less engagement in the programme.

8.5 Benefits

The benefits that emerged from participants' descriptions of their experience of using the programme were categorised into four themes – 'Increased Relaxation', 'Letting Go Of Worries', 'Increased Confidence' and 'Increased Coping Skills'. These themes will be described here.

8.5.1 Increased Relaxation

The programme was explained as a relaxation training programme; indeed this was in the title, (i.e. Music Relaxation Training (MRT) and Verbal Relaxation Training (VRT)) and therefore perhaps it is not surprising that those who listened, to the

interventions, described how they had learnt to relax. Some participants found that they had learnt this skill fairly easily; describing using the techniques taught in the VRT programme. One participant also reported finding the music even put him in receptive frame of mind as well.

> *'I know if I've a particularly stressful day I can go through to my bed, be alone, quiet and I know how to relax from the top of my head all the way to my feet basically the way the CD taught me.'. P4 Male VRT*

> *'I think the relaxation side came fairly easily…certainly after a while I could relax quite quickly you know using my kind of trigger mechanism' P1 Male VRT*

> *'I found with the programme it was good for relaxing, I think even the music used to make me feel relaxed, as soon as I heard the guitar music it got me into that kind of frame of mind, you know a very receptive frame of mind I would say'. P1 Male VRT*

In contrast to these descriptions from participants in the VRT group, participants in the MRT groups did not express having learnt relaxation techniques, rather relaxation, if experienced, was acquired by association with making time to relax and listen to the music. One participant described how he had not been noticed that he felt more relaxed until the second month.

> *… but then because I associated the music with relaxation time the music became relaxing …..it wasn't until about the second month when I thought `oh wow' you know when I realised actually I was actually enjoying the bus trip to work .. it made it nicer to kind of get on the bus 'P7 Male MRT*

Similarly another MRT participant explained how she had experienced the relaxation slowly and that it had seemed hard work to develop.

> ***Interviewer: I mean do you feel that you gained from listening to the programme .***

> *Mm, I think I did, yes I did feel … em after the, you know getting used to it I did begin to feel quite relaxed listening to the tapes.*

> ***Interviewer: How long did it take you to get used to the sort of music?***

> *I would say it took me to the second tape, you know the whole first few weeks I found it slightly a bit of a chore but I was determined to carry on with it.' P8 Female MRT*

In contrast, relaxation was described as developing quickly for those with VRT which made it easier to continue with listening. This links to the theme 'Finding Reward' previously described within 'Continuing Engagement'. This is illustrated by one participant who described a technique (clenching the fist) that is on the second track of the VRT programme, and therefore listened to in the second week, which she found helped her to relax.

> *'Yeah technique.. and there's one where you clench your fist and this actually works, it's really nice and the relaxation feeling you get after that it's so rewarding ..and (I) got it pretty quickly' P2 Female VRT*

8.5.2 Letting Go of Worries

Letting Go of Worries' was a benefit that emerged from the participants interviews. This theme is related to 'Increased Relaxation' and describes participants' experience of not ruminating, of relaxing the mind, *'switching off'*, or seeing things in a different way. One participant explained how knowing how to relax helped with sleeping and 'switching off' her brain, which she explained may not happen with other activities, like going to the gym.

> *'it helped me ... relaxing, ..I know how to do that if I have to so you know if I have a problem sleeping or if something stressed me very much I can know what to go back to and you know.' P2 Female VRT*

> *' sometimes you just need to switch off and you can go to the, I mean you can go to the gym or do other things but sometimes you can still keep your brain going so (its good to) kind of learn how to switch off your brain' P2 Female VRT*

Similarly other participants reported improved sleep. One participant described how the relaxation helped him '*switch off*' from thinking about work when he went to bed at night to sleep.

> *'I think at the time it was actually while you were doing it you did notice a difference and certainly at the time when you listened to it, it was certainly a relaxing thing because you know sometimes I would go to bed at night and you would have things would have happened at work or something and it would be*

difficult to get that out of your mind ..switch off, especially if you had been working hard that day or whatever and this would sort of get rid of that and I don't I'm unsure that was not the intention of the CD but once I started listening to it that sort of went you know. ' P3 Male VRT

Another participant described how she was able to reframe stress, to see it in a different way, to help her let go of it.

Interviewer: Would you say you've gained anything from listening to this programme?

'Em probably the breathing aspects of it and I think you know ....and I think it's just a case of you know I need to come first and you know if anything else then you need to look after yourself rather than you know … and I've kind of got to the stage if I don't do it "nobody's going to die from it" so if I look at it that way then I'm not going to stress myself out.' P5 Female VRT

One participant described how having to listen to the intervention had resulted in reorganising his day in order to make time to listen to the programme and that this had had a very positive effect, as, in so doing, he developed a system of work management (check lists) that enabled him to not worry about work.

' What it actually ended up doing for me was, I started doing my check lists before I went home and I've actually kept that up because I found that when I was thinking `well I'm not going through my check list first thing in the morning so write down what you need to do tomorrow before you leave so this way you don't have to worry about whether you've forgotten anything first thing in the morning' and I've continued that throughout so this way…

Interviewer: So it's altered your method of working?

Yeah, no absolutely because I knew I had this half an hour in the morning where I had to let myself relax, I've altered my work so that I could have that time to relax' P7 Male MRT

8.5.3 Increased Coping Skills

Another theme that emerged from the participants' data that was related to the main theme of 'Benefits' was having 'Increased Coping Skills'. This theme was revealed through participant descriptions of being able to manage their work and home life better.

Many participants who listened to the VRT talked about the specific relaxation techniques taught in the VRT programme and described how using these helped them cope with stress, such as maintaining control, and how this had given them an increased sense of coping, now and in the future.

> *'I'm just more relaxed about things now and I know I can cope with change, if I'm feeling down I know how to cope with it, I can go and relax myself, I can withdraw and you know use information I've learnt from the CDs, I've got tools, coping tools now that I can use.' P4 Male VRT*

> *I've already picked up some of the tips because one of the tips as you know is 'do that' (clench and relax the fist) when you feel yourself losing control and concentrate so I still do that, ... that's one of my techniques that I've listened to. P6 Female VRT*

Participants reported how they felt they could cope with work better, such as being more relaxed on the phone, when searching for something on the computer or stopping over-thinking about work.

> *' I would say even, I mean my own work doesn't really put me in stressful situations but sometimes when I'm on say the telephone.....and I'm trying to find something on the computer, maybe before I might have thought " Oh, I'm taking too long I should be doing" you know but now I can just relax that bit and think "it's okay I'll find it", so it (the programme) must be having a difference I think.' P1 Male VRT*

> *I could feel myself getting kind of worked up and it's just like, just as a reminder put it (the intervention) on as that kind of barrier to that kind of wanting to you know start thinking .. over-thinking about work before it's even started so. P7 Male MRT*

One participant expressed his greater coping ability through a greater sense of his ability to make decisions.

> *'One thing I think ...I feel that I make decisions more easy now....*

> ***Interviewer: Really?***

> *Or at least put it this way I don't deliberate quite so much over something, I might say `well I've got a course A or B' and I'll just say `A', that's it, it doesn't seem to remain a problems, it's not something I would mull over and kind of .. I think maybe not in every situation but certainly that's one thing I would say has changed.*

Interviewer: And you can definitely see a difference from before?

Yes I think so,

Interviewer: That's fascinating.

I'm not .. I don't get so uptight you might say about having to make a decision, I just think well this is the one I'm going for this and that's it.' P1 Male VRT

And he reported that the skills he had learnt could quickly be applied when needed.

' I don't feel I have to keep listening to the CD's for example or anything like that, once you learn the techniques you can apply them much more quickly   and I think that and as I said early, decision making, I'm sure that's easier for me now than it might have been before.' P1 Male VRT

Other participants found that the programme had beneficially impacted on their home lives. One participant commented on noticing how he no longer carried his work stress home, no longer needing to moan to his wife, and another participant described how he was calmer and better able to cope with his kids.

'I used to go home and moan about my work all day, all night and she (wife) was ..just got fed up basically listening to it but I had to get it out somehow, now that doesn't happen' P4 Male VRT

'like I was saying earlier about you know things that you would approach, you know approach things and get all flustered or into a panic or over react if the kids were misbehaving or something... I'm sure there was a sort of calming effect, seriously yeah. I'm sure I'm better with the kids' P3 Male VRT

And that similar to other participants he expressed that this change would stay with him.

Interviewer: Would you say that's increased or decreased since you stopped doing the programme?

I think it's stayed at that level, I was thinking maybe as time went by you would go back into your old ways or whatever but no I don't think so, I think it's like you've learned something and it stays with you. 'P3 Male VRT

One of the techniques in the VRT programme, was learning to use visualisation to help increase feelings of confidence and competence in future situations. In this technique the person imagines himself/herself in a situation in the future where he/she is managing that situation well. One participant explained how he had used this technique to help prepare him for an important event and that perhaps this had accounted for his feeling more relaxed than he had expected at that event.

> *'I think I can visualise myself doing things....I did feel more relaxed (during that event) than I thought I might, when the time came, whether this may have been something to do with the programme I don't know but certainly I tried to use that technique of seeing myself in the situation and trying to you know see myself doing what I had to do.' P1 Male VRT*

Similarly another participant reported seeking to use this technique to help deal with anxieties about presentations at work and described his sense that he was a little bit more confident but as yet had not had the opportunity to formally test it.

> *'One of the things that .. I became a bit nervous at work sometimes when I was asked to do presentations and things like that, as a lot of people are, so another reason and I'm not too sure because I've not really had the opportunity to do that yet in a formal way, I've had sort of informal things .. I'm not too sure if it's my imagination or I'm just a wee bit more confident as the more you do, the more you become confident but I'm hoping that … 'P3 Male VRT*

8.5.4 Increased Confidence

The theme of 'Increased Confidence' also emerged as part of the main theme 'Benefits', and will be described here.

Within the VRT programme there was a track specifically focusing on increasing self-confidence and perhaps not surprisingly many of those listening to the VRT commented on an increase in confidence. Confidence was expressed in different ways, sometimes this was described as just feeling more confident; through feeling more confident about being able to cope in the future, or feeling more positive about oneself.

'it's given me a lot more confidence and I'm more relaxed with myself. My wife has actually noticed a big difference in that as well...... 'I think I'm stronger, I'm more confident and I relate to people (at work) better' P4 Male VRT

This participant, who had previously been experiencing a lot of stress at work and had been off work with depression, also described how using the programme had given him a sense of being confident he could cope better in the future.

'Yeah and if the situation (stressful situation at work) ever happened in future I'd be better prepared to deal with it and I still use some things I learned from the CDs you know the relaxation, the shut my eyes, take a deep breath, relax my hands, the part where you visualise you know or a place you wanted to be, a safe place.. P4 Male VRT

Other participants described a sense of confidence as increased positive feelings about themselves, i.e. increased self-esteem. For example, one participant with the VRT programme reported that the programme did not build her confidence, as perhaps she did not need this, but later on in the interview she described being able to thinking about herself in a more positive way. This may reflect differing interpretations of what confidence means.

'Well I think it helped me (with) the whole relaxation thing, it did. I don't think it helped me in building up my self-confidence or the way I see myself and I don't think maybe, well I don't know if I needed it.'

Interviewer: ...what do you think you've noticed about yourself since you've listened to the programme, have you noticed anything different?

Well I think, well now it would be kind of, again just what I said before but I think that maybe thinking about yourself positively .... you know sometimes to kind of praise yourself and think about yourself in a positive way instead of just challenging yourself all the time.'P2 Female VRT

This sense of feeling positive about oneself was also expressed by another participant who reported being pleased with himself and that his confidence and coping strategies were now helping him tackle his weight.

'Yeah I'm quite pleased with myself because when I go back to where I was before I just wanted to sit in the chair, I didn't want to talk to anyone, didn't want to go out, didn't want to do anything,.. but as I say I've got over that now, I'm more confident,

> *I've got coping strategies I can use, so much so that I'm now tackling my weight issue' P4 Male VRT*

Another participant described a shift in her attitude that made her realise that she could get help from outside sources; that you don't always have to be depending on yourself. This perhaps is a result of feeling less negatively self-evaluative and more confident about asking for help.

> *but I've learned that actually if you search for help and if you rely on other people you might actually find help or learn something or get something positive so it's like it not always has to be about you and you don't have to be … just depending on yourself, that you can you know, do other things, you know, for example looking for tapes with the relaxation you know' P2 Female VRT*

8.5.5 Summary of the main theme Benefits

Four themes were revealed relating to described benefits. These were 'Increased Relaxation', 'Letting Go of Worries', 'Increased Confidence' and 'Increased Coping Skills'. These themes are all interlinked and, as they related to positive effects of the programme, they are important in maintaining engagement with the programme, linking this theme to 'Finding Rewards', a theme within 'Continuing Engagement'.

Although the interview data was qualitative data and as such drawn from a small group of participants, interview data revealed a marked difference in perceived benefits between the VRT and MRT groups. The VRT participants reported increased ability to relax and ability to let go of worries which resulted in better sleeping. They also described an increase in self-confidence, in feeling positive about self and in personal abilities to cope in the present and in the future, at home and work, through for example increased decision making and being able to relax. However, in contrast, MRT participants did not report such benefits. Their experience was expressed in terms of acquired relaxation through taking the time to listen. This difference reflects the differing intervention conditions. The VRT group listened to spoken word tracks specifically designed to teach relaxation, confidence and other coping skills, whereas the MRT participants listened to only music.

8.6 **Limitations**

Findings on the main theme of Limitations of the intervention (see the conceptual model at start of this chapter, Figure 8.1, now be presented here. Three themes emerged from the data within this main theme, which were 'Lack of Guidance', 'Finding Time' and 'External View of Stress'.

8.6.1 Lack of Guidance

Lack of guidance on how to use the programme was a theme relating to the programme's limitation that emerged from the participants' interview data. This theme reflected a desire for guidance, to be able to have someone to discuss the programme and progress with; a need for reassurance that they were on the right track.

> *'but it would have been actually nice to have kind of a mid-way check-point and I mean I know we got the forms to fill out but it would have been nice to have someone to discuss the process with kind of half way through just to find out you know if … you know just to kind of see where I'm at and see if I'm on track or if there's anything that I could be doing differently and ask questions if I had them.' P7, male, MRT*

One participant who listening to VRT programme, thought that it may be a good idea to have guidance from a specialist who could assess if the programme was right for that individual.

> *'the minute somebody says `oh I'm maybe feeling a bit stressed and depressed' they should be referred to a specialist who then looks and says `right well okay what is the best way of treating that' and if it's this programme fine, if it's something else fine cause not one thing fits everybody every time.'P6 female VRT*

One participant reported that as the MRT programme was only music, there was no spoken word to give some help in the form of tips, which he had been expecting.

> *'I think maybe that's why I think some of the spoken word would have been handy because I think in my head I was expecting tips' P7 Male MRT.*

Similarly another participant, in the VRT group, expressed that he was glad he had this intervention, and not the MRT intervention, as the music intervention would not have given him directions.

> *'I couldn't imagine if it was just music, I couldn't really imagine how that would help you and put you into these situations you know or make you think in that way just without anybody giving you directions you know, anyway I'm glad I got the vocals.'*
> *P3 Male VRT*

More guidance may have helped participants understand the programme, for example one participant reported how she did not know if falling asleep was a good thing or not, that she felt bad as she had not managed to keep her mind focused on the exercise.

> *It actually did (help with sleep).*
>
> ***Interviewer: That's super.***
>
> *Do you think that's good, I was feeling bad that I fell asleep that I didn't go through it, it was like `oh my god'.*
>
> ***Interviewer: No don't feel bad.***
>
> *I was feeling really bad, cause I was like `oh no I totally lost it, I was supposed to keep my mind focused on this exercise and I …'*
>
> ***Interviewer: Well I'm not the expert in what it's meant to do but I would have thought if it helped your sleep that's a very positive thing.***
>
> *Well it did.' P2 Female VRT*

Another participant, who had the VRT programme, expressed a number of practical ideas on how guidance could be improved. He explained that he thought it may be helpful to have a DVD with practical tips for example on relaxation and visualisation. This could also be something to show the family. He thought a group session on relaxation and breathing techniques could be helpful for some people, although he recalled that from his own experience of stress and depression, that he would not have wanted to be around people. He also reported that he thought a follow up session was a good idea.

> *'If it was put onto a DVD, you actually saw someone doing the relaxation and you know …that might be helpful for some people or to actually have a session with*

someone taking a whole group through it …although when I was depressed and really stressed I just didn't want to be around anyone so it would depend where you are, ..

Interviewer: No but that's really interesting so possibly a DVD so that there's actual … like having a class in your own front room as it were on the screen or a group?

Yeah and a you know like an example of someone … well some people might find it difficult to visualise a place where they were .. you know and if they were getting tips and hints and something practical to see because I think most of our learning is done by seeing so to see something.

T: That's great. Anything else that you can think of

Eh I don't know, maybe some sort of follow up you know like today, .could be useful. I'm trying to think ….. well family being involved as well, I suppose if there was something you could show to a partner ' P4 Male VRT

Lack of guidance also emerged as being linked with the theme 'It Made Sense', a subtheme of 'Initial Engagement'. The 'It Made Sense' theme highlighted the difficultly participants found in understanding an intervention that had very little explanation.

8.6.2 Finding Time

Another limitation of the programme that was identified in the data was the theme 'Finding Time'. Those participants who reported that it was difficult to find the time to listen to the programme, attributed this to less engagement and identified it as a limitation.

> *'I mean I know it only takes like 18 minutes or something to do it but it was finding the time to do it was probably one of them (barriers to listening)' P5 Female VRT*

Participants also described having competing priorities for their time and how it could be hard to make the time to listen.

> *'I couldn't really fit in time during the working day, that just wasn't practical and you know I tried to do it when I went home just to sort of take time out to do that but then if I was , had something on in the evening, I wanted to get the meal made and , so it wasn't really practical' P8 Female MRT*

Similarly another participant described how she stopped listening to the CDs as there was just too much going on in her life. She described how it was not the right point in her life to fit in listening to the programme; there were too many demands on her time.

> *'I think that was the wrong time of my life to do it .....(as I) was trying to do other things ....I would like to do it in my own time separately...... I would like to do that you know a more leisurely pace when it suits me and I'm not trying to do too much of everything else at the same time' P6 Female VRT*

This theme also links with the 'Making a Routine' theme which is a theme within 'Continuing Engagement'. Data from both the 'Making a Routine' and 'Finding Time' theme both suggest that female participants find it harder to find the time and establish a routine than male participants.

8.6.3 External view of Stress

The third theme to emerge from the participants' data related to the main theme 'Limitations' was the theme of 'External View of Stress'. Participants who reported finding it hard to engage with the programme, talked about feeling *'helpless'*, and stressors being *'immovable'*.

> *'a lot of the things in my life are immovable at the moment' P11 Female MRT*

A participant, who found MRT had not helped her let go of her stress, explained her inability to relax was due to an unresolved external stressor. For this participant her stress was perceived to be outside her control.

> *'so I'm not going to feel relaxed and more able to manage until that's resolved (by someone else)' P8 Female MRT*

Similarly another participant who had not engaged with the MRT, also expressed stress and stressors as something she just had to go with, unable to be changed.

> *'Well I have a very stressful life, I have a huge amount of stress, I surf from stress continually.*

> *Interviewer: What do you mean by surf stress*?

> *'You can't swim through it you just have to go with the waves, get on your board and just go over the waves a bit, you can't swim through what I've got'. P11, Female MRT*

This view of stress, as out of one's control was similarly described by a participant with VRT, who had also reported limited engagement with the intervention.

> *'..there just absolutely nothing I could do about it (stressors) 'P6 Female VRT*

Analysis then suggested that having an external view of stressors and one's stress was a perception that inhibited engagement with the programme and therefore a limitation to engagement.

8.6.4 Summary of the main theme Limitations

Analysis of the data reveals that having more guidance on using the programme, either from a point of contact and/or DVD or group would have been helpful for some participants. Another theme which was identified as being related to limitations was 'Finding Time'. This related to the difficulty expressed by female participants in prioritising the time to listen, and the negative impact this had on being able to listen. It was notable that this limitation was not expressed by the male participants. Additionally, some participants who had found it hard to engage with the programme, expressed an external view of stress; that it was not under their control. In contrast, those who had described positive effects from engaging with the programme (see 'Benefits' theme, Section 8.5), also described having a feeling of being in control of their stress, and more able to cope - an internal locus of control.

8.7 **Theme Integration**

Throughout the description of the themes and subthemes it can be noticed that there is considerable overlap of many themes. The interviews were an exploration of participants' experiences and insights into their use of the interventions and analysis drew on revealing the themes and categories of these descriptions. Inevitably there are commonalities between these.

Within the 'Continuing Engagement' theme for example the theme 'Finding Reward' is clearly overlapping with the main theme of 'Benefits'. 'Finding Reward' was identified as one of the factors that increased motivation. Difficulty in finding rewards is linked to the theme of 'Finding Time', within the main theme 'Limitations', as without the positive feedback from finding rewards, participants reported that motivation to continue listening was harder, and therefore it was harder to find the time to listen. Similarly there is a link between the motivation theme of 'It Made Sense' and the 'Lack of Guidance' theme, within the 'Limitations' theme, as without guidance it may be harder to make sense of the programme.

Benefits encompassed immediate pleasures, such as relaxation as well as later gains, such as those reported in 'Increased Coping Skills' and 'Increased Confidence'. There is overlap between the benefits described, many of which developed from the increased ability to relax. However in order to tease out differences and complexities of the interventions, the benefits reported have been categorised into four themes which encompass relaxation, behaviour change and attitude change.

Finally it seems appropriate to comment on the cyclical nature of a process, such as listening to an intervention over 12 weeks. By this it is meant that relationships and associations that became apparent are not necessarily linear; not a simple cause and effect relationship. For example the MRT participant who in order to make time to listen, had to reorganise his work. To reorganise his work, he developed new work strategies (check lists) that resulted in him worrying less about work, and freeing up time to listen. He was then able to relax and enjoy listening, which made him more

relaxed which in turn positively impacted on his work. This illustrates the complex and cyclical nature of change.

8.8 Summary of Results

In summary, motivation to listen to the programme was found to consist of two themes – 'Initial Engagement' and 'Continuing Engagement. 'Initial Engagement' was influenced by looking for help with stress, being open to the opportunity to try the programme, finding the structure of the programme appealing and also having an understanding of how the programme worked, so that it made sense within existing beliefs and experiences. Motivation for continued engagement was influenced by finding rewards, making a routine for listening, being committed and having open expectations. Those participants who reported specific expectations were also less likely to be motivated to continue listening. Limitations of the programme were identified as being lack of guidance, finding time to listen and having an external view of stress. There also emerged from the data a difference in the ease of engagement between men and women. Women reported having competing demands on their time which impacted on their ability to find the time to listen.

Many benefits were reported by the participants, and these were categorised into four themes – 'Increased Relaxation', 'Letting Go of Worries', 'Increased Confidence' and 'Increased Coping Skills'. When these benefits were experienced, participants reported positive effects on their work and home life.

The participants were drawn from two different groups which had different interventions to listen to. There was a music relaxation training group (MRT), and a verbal relaxation training group (VRT). Although the themes identified from the participants data are relevant to all participants, from the process of contrasting these two groups it was possible to make clearer the motivators, benefits and limitations of the interventions. It seems appropriate to comment on differences observed between the VRT and MRT groups, with the caveat that inferences drawn from the comparison

are indications of possible differences between the VRT and MRT groups, which are discussed in conjunction with the quantitative results in the next chapter.

The qualitative analysis revealed that for those participants that were interviewed, there was a clear difference in experience of those participants in the VRT group compared with the MRT group. The absence of the spoken word in the MRT directly impacted on skills learnt, as, unlike in the VRT group, there was no instruction on developing relaxation skills, using coping techniques and visualised rehearsals. This may account for the difference in benefits between the two groups. Perhaps not surprisingly then, those in the MRT group reported fewer benefits which were more slowly gained compared with those in the VRT group. This impacted on motivation, and therefore motivational factors, other than reward, had to be employed, e.g. commitment. Participants views expressed that motivational factors may be harder to sustain without finding reward, such as when the music was not liked.

8.9 Consideration of the Conceptual Framework

Data analysis of the interviews, describing the experience of listening in terms of benefits, limitations and motivation, has been described within the conceptual framework shown in diagram 8.1. This illustrates the interconnectivity of the three main topics which reflect the three main research questions. These questions are designed to explore the participants' experiences of listening to either the MRT or the VRT programme and are part of a larger study comparing the two interventions. The conceptual framework was designed to get beyond the simple differences between the two programmes and to explore the similarities of experiences of listening, whilst giving a structure for discussion of themes, concepts and their relationships. It was felt this would allow emergence of richer data relating to motivation and limitations and this is reflected in some of the themes that have been revealed, such as open expectations and lack of guidance.

Frameworks do have their limitations in that themes and concepts are 'forced' into these. This has been addressed by the consideration of overlapping themes within each

section and the overview of integration themes at the end, before this summary. The analysis is an exercise in balancing the complexity of the data with simplicity of structure to enable a clear understanding of the emergent themes.

9 Discussion

This chapter will discuss the findings from participant interviews, described in the preceding chapter, which were conducted to elucidate understandings of the process of engagement with the programme and participants' experiences of listening to the programme.

The interviews were based around three research questions, which were; 1) what motivated the participants to listen to the programme; 2) what were the participants' perceived benefits of the programme and; 3) what were the participants' perceived limitations of the programme. This chapter will discuss the findings in relation to answering the three research questions, followed by a consideration of the method.

9.1 What motivated the participants to listen to the programme?

Participant motivation was found to consist of two themes – 'Initial Motivation' and 'Continuing Motivation'. The interview analysis found that initial motivation to join the study was expressed as a desire to find help with stress; ways to help themselves feel better and to cope better with stress.

The theme of 'It Made Sense' also emerged from the data as contributing to initial motivation to join the study. This theme was identified from participants' descriptions of previous experiences with similar 'alternative' therapies. The relevance of the theme 'It Made Sense' on motivation can be understood within different motivational theories. Firstly self-determination theory (Ryan & Deci, 2000) proposes that the more fully processes are internalised, such as when something makes sense, then the greater the motivation. Secondly attribution-based motivation theory (Weiner, 2012) acknowledges the influence of past personal history (such as previous experience of therapies) on causal explanation of processes and outcomes. The participants in this current study reported past experience of similar programmes, such as alternative therapies, e.g. tai chi, and it may be that these previous experiences made it easier for

participants to enter the programme as it fitted in with their beliefs, experiences and understandings, which may have increased their intrinsic motivation to try it. Alternatively, of course, it may be that the type of person who is drawn to alternative therapies, may be also attracted to the idea of the programme.

Linked to the 'It Made Sense' theme, was the 'Lack of Guidance' theme within the main theme of 'Limitations'. This may have been particularly important in this study as due to the research study RCT methodology (study 1), the participants were blinded to control or intervention, and accordingly then to prevent disclosure of the active intervention, there was very little explanation of the programme, particularly for those in the MRT group who only had music to listen to whereas those in the VRT had instructional tracks. Without some prior understanding and a cognitive framework it may have been hard to understand the process. The Positive Mental Training Programme as it is currently used does include a DVD that explains how the programme works. This lack of information also emerged as a limitation of the programme for some participants who voiced the lack of a designated person who would have been able to provide guidance, where necessary.

Another theme which emerged from the data, that was associated with continuing motivation to listen, was having 'Open Expectations'. Other researchers have reported that openness is associated with motivation to pursue promotional goals, such as increased exercise (Senay. *et al*. 2010) rather than prevention oriented goals, such as drinking less alcohol (Vaughn *et al*. 2008). Similarly Hassin, (2008) suggested preventive goals reduced open-mindedness, and conversely being more closed minded was associated with having more specific goals. As voluntary, self-help programmes, both the VRT and MRT interventions provided promotion related goals, i.e. a positive outcome of coping better. Interestingly although not quantitative in nature, it emerged from the interview data analysis in this study, that men described easier engagement with the programme compared with women. Perhaps this is a reflection of the promotion orientation stance of the programme, supporting other researchers finding that promotion orientated approaches are less appealing to women (Soffer, 2010). Additionally, this current study revealed that women identified 'Finding Time' as a

barrier to engagement, reporting conflicting demands and difficulty making a routine (described within the 'Limitations' section of the results). This may be explained by the social roles of women which made it more difficult to priorities listening. Indeed social roles have been identified as contributing to the higher levels of stress that have been recorded in women (Thomas, 1997) and stress has been found to be a barrier to engagement in women (Soffer, 2010). Time has been reported elsewhere as a barrier to lifestyle change (Mosca *et al.* 1998). Similarly other researchers (Lovato & Green, 1990) have found that logistic barriers i.e. time and place were the commonest reasons for dropping out of health promotion programmes.

The data in this current study revealed that those participants who described having specific expectations, were more likely to express dissatisfaction and decreased motivation. Specific goals can generate expected rewards, which are externally regulated motivators, motivating the individual through the acquisition of the reward (task). These are less powerful motivators than internally generated (intrinsic) motivators (Ryan & Deci, 2000). This may help explain the findings in this current study that participants who expressed specific goals (expected rewards) were more likely to express dissatisfaction and decreased motivation, compared with those who had non-specific goals and open expectations. Such non-specific goals can generate unexpected rewards which are more powerful motivators through intrinsically generated positive experiences, e.g. interest, joy, excitement and satisfaction (Ashby *et al*. 2002). This may explain the observations in this current study that those with open expectations (non-specific goals) were motivated to continue listening and possibly found this motivation from the fact that listening was a pleasurable experience.

Perhaps unsurprisingly the theme of 'Finding Reward' was found to influence continuing motivation. Other studies (Deci *et al.* 1999; Selart *et al.* 2008) have also indicated that the self-autonomy aspect of learning and acquiring skills can produce rewards through intrinsic motivation (Grouzet *et al.* 2004; Vallerand & Bissonnette, 1992). It may be that positive affect (PA) is the mechanism whereby skills and autonomy contribute to motivation to listen as it has been suggested that PA increases

the *'desirability of desirable rewards'* (Isen, 2008, p. 559) and may increase motivation where effort on the task can produce achievable results (Isen, 2008). It may be that motivation to listen was increased due to increased levels of PA, internally generated in participants who found reward, or benefits such as enjoyment or through the acquisition of skills, such as those reported by participants and described under the main theme 'Benefits'. Also a recent study demonstrated that a component of PMT increased PA in those with low mood (Dobbin *et al.* under review).

Intrinsic reward is dependent upon actually experiencing feelings of joy etc. (Lepper *et al.* 1999) and where these are not experienced, as in for example those participants who did not like the music as expressed with *'I hated it'*, these participants reported being less motivated, and expressed their stress and stressors with such concepts, such as feeling *'helpless'* (an expression of external control) and stressors being *'immovable'* (stable). This aspect has been reported in the theme 'External View of Stress' within Limitations, Section 8.6.3. Other researchers have noted a similar relationship between negative feedback and de-motivation (Ryan & Deci, 2000) which has been found to be mediated by perceived control (Vallerand & Reid, 1984). An externally perceived locus of control diminishes autonomy and undermines intrinsic motivation (Deci *et al.*, 1999).

9.2 What were the participants' perceived benefits of the programme?

Reported benefits from listening to the interventions were categorised into four themes; 1) Increased Relaxation, 2) Letting Go of Worries, 3) Increased Confidence, 3) Increased Coping skills.

The interventions were described to the study participants as relaxation training programmes and participants in both the VRT or MRT interventions reported feeling more relaxed, although there emerged a marked difference in the descriptions of the

relaxation experience between the two groups; with those in the VRT group describing more rapid and wider benefits compared to those in the MRT group.

The method of relaxation was different in both groups. The MRT group had music and no instruction whilst those in the VRT group had one week of guided progressive muscular relaxation, followed by a week of consolidation of muscular relaxation, breathing techniques and development of a conditioned relaxation response to act as a shortcut to the full relaxation. Additionally there followed 2 weeks of developing mental relaxation through visualisation techniques. This type of relaxation shares similarities with other mind body therapies which have been reported to reduce the stress response (Park *et al.*, 2013). In particular VRT shares similarities with 1) acquired relaxation which has been used to successfully reduce anxiety and perceived stress in pregnant women (Bastani *et al*. 2005) and 2) somatic training, which has been reported to increase relaxation and positive psychological states (Jain *et al.*, 2007). It seems probable that this aspect of physically practicing a technique resulted in those in the VRT group expressing a sense of having learnt relaxation skills and having learnt these skills they would stay with them to be used in the future. Although the expression of learnt relaxations skills were absent from the MRT interviews, the act of simply making time to listen to music had a positive effect on some participants. This concurs with other studies which have found that *exposure to music leads to a lowering of psychological stress'* (Biley 2000, p. 674). However, in contrast to this current study which found that instructed relaxation was more effective at promoting sleep, than the music alone, other researchers have reported a beneficial effect of music on sleep (Ziv *et al.* 2008). Indeed a meta-analysis on the effects of music on decreasing stress arousal found that music preference and type of relaxation technique were among many significant factors that influenced the outcome (Pelletier, 2004). Research on music preference has shown that experimenter chosen music resulted in poorer performance and increased tension and anxiety compared with self-chosen music (Cassidy & MacDonald, 2009). This perhaps emphasises the heterogeneity of music and its effects.

Other benefits that were reported by the interview participants were increased confidence and increased coping skills. This result is in contrast to the meta -analysis

carried out by van der Klink *et al.* (2001) who found that neither relaxation nor multi component studies significantly increased coping skills, whereas cognitive (CBT) interventions did. However this only included one study in the multimodal category, whereas there were five in the relaxation group and 10 in the CBT group.

On the other hand, the participants reported increase in confidence and coping is consistent with the theorised actions of the PMT programme and its origins in elite sports training (described fully previously, see Section 1.8). Mental training techniques have been extensively used and studied in the field of sports (Mamassis & Doganis, 2004). Mental rehearsal, one of the components of VRT, has been used in sports to increase confidence (Callow *et al.* 2006) and has been shown to reduce anxiety levels in sports competition (Hale & Whitehouse, 1998). Imagery has also been associated with mental toughness and coping with adversity, as well as working through difficult situations and the use of mental imagery techniques, specifically motivational general mastery imagery, has been shown to significantly predict mental toughness in athletes (Mattie & Munroe-Chandler, 2012).

It may be that mindfulness also played a role in the reported increased coping. The VRT programme shares much with mindfulness, through attentional manipulation, as described in the introduction, (see Section) and it may be that listening to the MRT also involved attentional manipulation. Mindfulness has been found to increase positive strategies for coping (Walach *et al.* 2007) and to decrease negative cognitive distortions (Sears & Kraus, 2009). Similarly mindfulness meditation (MM) and somatic relaxation have been found to significantly boost positive mood states, using the PSOM scale, which is correlated with PA (Jain *et al.* 2007). Positive affect has been associated with many beneficial cognitive aspects and has been shown to promote increased coping in negative or stressful situations where there is a benefit to attending to the task well, or where the task has to be dealt with (Aspinwall, 1998, p. 552). Creative problem solving and decision making are both aspects of cognitive flexibility that are promoted with positive affect (Isen & Labroo, 2003). The generation of PA, through listening to the interventions, as found in Dobbin *et al.* (under review), may then explain some of the benefits that the participants described. For example, one

participant described creatively solving a work organisation problem, through perhaps the PA generated from listening to the music. Other VRT participants described feeling more confident at work, and at home, of being able to cope with work better, for example when answering queries on the phone, and giving presentations.

9.3 What are the participants' perceived limitations of the programme?

Participants described 'Lack of Guidance' as a limitation. As part of the research design to blind participants to the intervention and control, little written information was provided, and although there was a research administrator (as the CI was not allowed to have contact with the participants due to ethical reasons), this person was not perceived by the participants as someone they could approach for guidance. Some participants felt that guidance could provide follow up, and give more support if necessary and screening or advice on suitability of the programme for individuals. When the intervention was used for mental health referrals to occupational health, the explanatory DVD was rated very highly as a beneficial part of intervention (Thompson, 2010a). It may be that if those who had difficulty engaging had been given some guidance and goal setting, then this may have helped them maintain motivation and engagement. Indeed goal setting and monitoring participants attitudes towards the intervention has been identified as recommendations for successful implementation (Lovato & Green, 1990; Murta *et al.* 2007). Guidance either by a person or a DVD and goal setting may provide a cognitive/emotional framework and expectation of recovery, which, has been found to influence mood and physical symptoms (Crichton *et al.* 2013) and be a predictor of recovery from mental health disorders (Blatt *et al.* 1996), and from workplace injury (Fadyl & McPherson, 2008).

Other limitations that were described by the participants were 'Finding Time' and an 'External View of Stress'. Both these themes overlap and influence continuing motivation and have been discussed earlier under the motivation section.

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9.4 **Consideration of methods**

The data analysis of participants' interviews extended the understandings of the intervention over and beyond that of the quantitative part of the evaluation study.

Questions of validity and reliability also apply to qualitative interviews and this study had in place a number of strategies to help ensure quality. For example using an experienced researcher to conduct the interviews, as this study did, helps to counter interview bias (Ovretveit, 1998). Additionally the CI has previous experience of qualitative analysis. Interviewee biases can be reflected in 'hindsight bias', i.e. remembering or describing in such a way that it distorts the 'truth' (Golden, 1992; Nathanson, 1978). Methodological rigour helps to minimise such bias and was applied in this study through the technique of cross referencing of themes within and between participants. This increased the credibility and confirmability of findings as applicable to this group of study participants. The CI, for ethical reasons, had to have no contact with the participants. Although this is a strength of the study, by minimising researcher bias through aiding objectivity, this is also a limitation. It may have been that from not being able to conduct the interviews the CI missed unspoken communication in the interviews. However the interview recordings did convey much unspoken information through the tone and intonation of speech. Adopting a grounded theory approach for data analysis has the advantage of thematically categorising the data but by putting data into themes, but a disadvantage of this method is that it becomes more challenging to convey the complexity of the data and the relationship the themes have to each other.

Drawing interviewees from a randomised controlled study has allowed the comparison of experience from those within the different groups. Although caution has to be applied as to the generalizability of those participants in both groups, there seemed to emerge from the data some clear differences between the listening experience of those in the control group and those in the intervention group. Those in the intervention group (VRT) reported having greater engagement, quicker appreciation of positive effects and wider and more lasting benefits.

The participants of the study were self-selected, in joining the study and agreeing to be interviewed, and therefore represent a biased sample of volunteers, that may be unrepresentative of the workforce. However theoretical sampling was applied and is a technique that can help increase generalizability, and can therefore increase the confidence with which the results are interpreted. Another methodological limitation is that the participants' data and analysis were not checked by the participants as being an accurate representation of what they said and meant.

9.5 **Conclusions**

Analysis of participant data revealed differences and similarities of experience for participants. Reasons for entering the study and motivations to listen were similar between participants whilst continuing listening was found to be influenced by reward and therefore group allocation made a noticeable difference. There also emerged a difference in the ease of engagement between men and women, resulting from women's social roles conflicting with making time to listen.

This study contributes to understandings about health behaviour motivations and supports the theories that intrinsic motivation is a more powerful motivator than external rewards and that there are gender differences in engagement with this type of health promotion activity.

This study also illustrates the perceived need for stress management programmes in the workplace as many participants reported they were looking for help to manage stress and liked the idea of accessing the programme at work. The study draws attention to the importance of having a point of contact for health promotion interventions at work and suggests that a self-managed complex intervention encompassing both relaxation and mental training techniques, could help some employees learn skills which could improve sleep, increase relaxation, confidence and coping skills, which could help them at home and at work.

10 Consideration of Studies 1 & 2

Study 1 and study 2 took different methodological approaches to evaluate the effectiveness of the health promotion programme Positive Mental Training, as an intervention to boost mental health and wellbeing in a healthy working population. Using mixed methodology is a recognised approach to broaden understanding. It is not that one method verifies another, but rather that each method helps to develop an understanding of the phenomenon under study. Different methods can provide different ways of knowing to provide a rich and complex picture, through corroboration of validity, elaboration of understandings and initiation of new theories (Blackie, 2000). Here in this current study quantitative and qualitative methodology were used to provide different understandings of the process and outcomes of a health promotion intervention in the workplace. The quantitative method was outcome focused and the qualitative approach whilst more process focussed also included outcomes assessment. Process evaluation has been identified as necessary for good evaluation (Murta *et al.* 2007).

Specific differences emerged between those who listened to intervention (VRT) and those who listened to control (MRT). Study 1 found significantly greater improvements in wellbeing and depression in the intervention group compared with the control group. Whilst comparison between groups is more of a quantitative question, in study 2 there were also noted differences that emerged between these two groups, from the participant interviews, particularly in the development of relaxation, confidence and coping skills. Results from these two studies then strengthen the generalisation that the control and intervention groups did result in differing experiences and differing outcomes. The analysis of the interview data in study 2 helps describe those differences observed in study 1 and suggest that recovery from depression and increase in wellbeing (observed in study 1) resulted from increases in relaxation, confidence and coping (observed in study 2). This is supported by current literature as confidence and coping have been identified as characteristics of positive emotions (Lyubomirsky *et al.* 2005), positive emotions are a component of wellbeing

(Diener, 1984) and a low level of positive emotions is a distinguishing feature of depression (Clark & Watson, 1991). This is also consistent with a recent RCT study of a reappraisal component of PMT, previously described, which found that positive emotions were significantly increased in depressive students, compared to non depressed students (Dobbin *et al*. under review). This is consistent with the theorised mechanisms of change of PMT; that PMT will increase PA through attentional manipulation and increased adoption of positive suggestions.

Results of study 1 also showed that mindfulness increased in both groups, with the intervention group approaching being significantly more effective at 26 weeks compared with the control. In study 2 VRT participants described being able to let go of worries and switch off and this gives insight into the possible mechanism by which mindfulness may develop. Mindfulness as a technique teaches to step back from your worries, i.e. adopt an experiential thinking mode and experiential thinking mode has been found to be associated with re-appraisal (Fresco *et al.* 2007). Letting go of worries in study 2 was reported by those who also reported relaxation. Analysis of the qualitative interviewees revealed a difference between the groups in the speed and process of developing relaxation. Those in the intervention group (VRT) recounted acquiring relaxation through the instructional audio tracks, whereas those in the control group (MRT) described acquiring relaxation through taking the time to listen, and in this way relaxation slowly developed. This supports the theory that the relaxation as taught in the PMT programme, through employing attentional manipulation, developed the ability to be mindful. Whereas listening to music, although increasing mindfulness in the short term, perhaps also through the attentional focus of listening to the music, did not teach the skill and therefore those participants in the music group were less able to develop a longer term ability to be mindful, in contrast to listening to the PMT programme.

The ability to relax, albeit through a different process, may explain the equivalent beneficial effect of the control and intervention groups observed in the stress, anxiety and exhaustion outcome variables in study 1. This may also suggest that there may be a differential effect of relaxation and mindfulness on indicators of mental health and

wellbeing. For example, it may be that mindfulness is more effective for depression, whereas somatic relaxation is more effective for anxiety. Mindfulness has been shown to be an effective treatment for both anxiety and depression (Holmes *et al*. 2010). However research suggests that mindfulness operates in different ways according to the clinical context, with rumination and reappraisal mediating the relationship with depression and worry significantly mediating the relationship with anxiety (Desrosiers *et al.* 2013) Future research could look at investigate mindfulness and somatic relaxation on worry this in a non-clinical sample.

Another factor that may also help explain the similarity of effect between the two conditions, may be positive expectation of the intervention, known to influence outcomes (e.g. Hasson *et al*. 2010, Crichton *et al*. 2013). Indeed study 2 revealed that one of the themes influencing initial engagement was non-specific expectation.

An interesting finding in both studies was the effect of gender on engagement. In line with other workplace studies (Hasson *et al.* 2010), study 1 found that more women entered the study than men. Study 1 also found that on average women listened less than men. Analysis of study 2 data can help elucidate why this may have been so. Interview data revealed that the social roles of women conflicted with finding time to listen, making it harder for women to engage with the programme. Another theme identified as a limiting factor from the interview data was Lack of Guidance. Participants' views highlighted the need for a support worker for workplace interventions, which corroborates other researchers' findings, such as Goetzel and Ozminkowski (2008) and Murta *et al.* (2005). The lack of guidance may have been a contributing factor to the high attrition rate in study 1.

A limitation of the programme is that it takes an individual approach. Whilst this approach is within a biopsychosocial model which is recognised as being most beneficial (Lunt *et al.*, 2007), it does not address organisational issues. Additionally although meta-analysis, (van der Klink *et al.* 2001), has shown that individual approaches are more effective than organisational approaches, (which may be a result of methodology), others have advocated that the best approach for health promotion

to address job stress, is to have a combined approach, of individual and organisational directed interventions (Noblet and La Montagne 2006). The individual approach has been criticised as blaming the worker and ignoring the adverse influence of the organisation as well as falling short of health promotion principles which incorporate the influence of social, economic and environmental determinants of health (ENWHP, 2003). However health promotion principles also encompass individual self-actualisation, which would enable an individual to take more control of their lives. This, it is argued by this current author, may result in employees taking a more active position in addressing organisational issues that need to change, thus addressing both issues. An employee with high self-esteem and positive affect, is more likely to feel able to propose an organisational change and is more able to problem solve and to have better communication abilities with which to negotiate, to the benefit of both parties (Isen, 2008).

10.1 Conclusion

Adopting two different methods for evaluating a health promotion intervention is an effective strategy, particularly as the intervention was multi- component and novel. Mixing methods in this current research has provided data that complement each other to expand the understandings and findings of the evaluation of Positive Mental Training in the workplace. The main findings from study 1, that PMT is significantly more effective at improving wellbeing and depression than control, can be understood within the context of study 2, which points to the role of relaxation, confidence and coping in resilience, mental health and wellbeing. Results also suggest that attentional manipulation (mindfulness) is an important mechanism underlying these changes. Additionally interview data can help explain participant engagement through revealing complexities of motivation to engage with a health promotion programme which may have impacted on attrition rates, as well as drawing attention to limitations that can be addressed in future research or workplace implementation. Finally, mixing methods steps beyond the simple outcome analysis by looking at the process as well.

Overall these studies in combination indicate that Positive Mental Training is likely to be effective at building resilience and wellbeing for employees. Analysis suggests that this may occur through increasing confidence and coping, at home and work and the findings of the control group highlight the benefit of taking time to relax per se The interaction between gender, stress and health promotion activity as explored in these studies points to a possible need to target workplace interventions considering the different needs of men and women. Future research, as in these current studies, should encompass process and outcome measures and could further explore the gender differential and intervention engagement. Additionally further evaluation of Positive Mental Training, as with other health promotion interventions, should be carried out against a waitlist or no treatment control as well as an active intervention.

Further studies into the underlying mechanisms of PMT, could further explore the role of attentional manipulation and relaxation as underlying mechanisms of change in wellbeing and resilience, teasing out their differences and similarities. Results from study 1 and study 2 showed that while mindfulness increased in both groups, wellbeing only increased in the PMT group. This was as expected as PMT is more than a mindful intervention. It also contains positive self-esteem and reappraisal suggestions. However to what extent does the mindful component of PMT, i.e. mindful relaxation, interact with suggestion? This is the area under investigation in study 3.

<div align="center">**Study 3**</div>

<div align="center">*A comparison of the effectiveness of positive suggestion, delivered with or without relaxation, on self-esteem, mood, cognitive bias, and resilience.*</div>

11 Introduction

This study followed and expanded the previous study, where a health promotion intervention was evaluated in a working population, and undertook a component analysis to investigate the underlying mechanisms, suggestion and relaxation, whereby Positive Mental Training may have an impact on mental function, specifically building mental resilience and promoting mental health and wellbeing

One of the aspects which contributes to the emotional health of an individual is their underlying cognitive processes (Lau *et al*. 2004). A positive processing bias has been found to be associated with resilience (Arce *et al.* 2009) and if we have a negative processing bias, then we are more likely to interpret ambiguous information as threatening (Richards & French, 1992; Yiend & Mackintosh, 2004). A negative processing bias (cognitive bias) has been found to be associated with anxiety disorders (MacLeod *et al*. 1986), social anxiety (Huppert *et al.* 2003) and depression (Bisson & Sears, 2007; Rude *et al.* 1988). It has been found to be predictive of depression (Rude, *et al.* 2003) and causal in heightened anxiety to threat (Hirsch *et al*. 2007; MacLeod *et al,* 2002; Mathews & Macintosh, 2000). Accordingly there has been much research into the possibility of modification of cognitive bias with a view to aiding recovery from emotional dysfunction.

Cognitive bias modification (CBM) studies have commonly focused on training in relation to its effect on depression or anxiety. Paradigms typically include either

attention training (CBM-a), for example training participants to focus their attention to or away from threat related words using a dot probe technique (MacLeod *et al.* 2002), or interpretative training (CBM-i), commonly using positive, negative or neutral resolution of ambiguous scenarios, for example (Mathews & Macintosh, 2000). These interpretation training materials involve study participants reading (Salemink *et al.* 2009) or listening to (Holmes *et al.* 2009) 100 ambiguous scenarios which are manipulated to be resolved either positively or negatively, according to the training valence.

Positive affect, although identified as a notably absent feature of depression many years ago (Watson *et al.* 1988), has only more recently been a focus of research in emotional dysfunction and underlying cognitions, for example (Holmes *et al.* 2009; Holmes *et al.* 2008; Joorman *et al.* 2007; Pictet *et al.* 2011)

One key CBM study looking at positive emotions and CBM is Holmes *et al.* (2009). These researchers studied CBM-i with audio recordings of positively resolved scenarios, comparing differing types of positive training conditions. Participants were randomised to either *'imagine the events' or 'listen to them while thinking about their verbal meaning'* (p.78). Cognitive bias was measured once, after training, and the result suggested that those in the verbal condition had a greater negative cognitive bias compared to those in the imagery condition. The imagery group also showed greater decreases in state anxiety, greater increases in positive affect and greater degree of protection against a negative mood induction (as measured by reduction in positive affect) than the verbal condition.

Standage *et al.* (2010) recently simplified this procedure. These authors used 30 non-ambiguous positive statements for positive CBM, (e.g. '*I like attending formal social occasions. It's a chance to meet up with people and celebrate something special together'* (Standage *et al.* 2010, p. 6) and demonstrated a significant increase in positive cognitive bias and positive mood. These researchers also demonstrated that mood change per se, from a music condition, was not sufficient to cause a shift in cognitive bias.

It was therefore hypothesised that the self-esteem suggestions in the intervention would, similar to Standage's research, serve as a CBM programme, and result in increased levels of positive cognitive bias and positive mood. Additionally as the CBM condition in this current author's research focused on positive self-affirmations, it was hypothesised that self-esteem would also increase.

> *Hypothesis 1: The intervention conditions would give rise to significantly greater levels of self-esteem, positive affect and positive cognitive bias, and concurrent lower levels of negative affect, compared to a control.*

Generation of positive affect, after a stressor, is also used as a measure of resilience. Resilience is commonly defined as the ability to bounce back from adversity, and increased resilience is positively correlated with higher levels of positive affect after a stress induction (Tugade 2004; Philippe *et al*. 2009). It would seem then, that positive CBM may be related to resilience by maintaining greater levels of positive affect after a negative mood induction. Indeed, Telman *et al.* (2013) suggest in their study with adolescents and CBM, that positive CBM may boost resilience. Therefore it was thought that the intervention conditions, would boost resilience, through generating positive CB and positive affect and this would serve to protect levels of PA after a stressor.

> *Hypothesis 2: The intervention conditions would increase resilience, as measured by the maintenance of positive affect after a negative mood induction, compared to the control.*

Resilience was tested by a negative mood induction, and to ensure that it was not just positive mood that protected against negative mood induction, a filler task similar to previous research (Hayes *et al*. 2010) was introduced to ensure mood was the same in both conditions after the CBM procedure.

Another important finding in the Holmes and colleagues (2009) study was that whilst participants in the imagery group showed greater *decreases* in state anxiety,

participants in the verbal group showed an *increase* in anxiety after the CBM-i. This replicated previous findings (Holmes *et al.* 2006). The authors proposed that this was most likely to be an effect of participant 'evaluation' in the verbal group, which resulted in affective contrast, i.e. a worsening of mood when presented with a positive scenario. This has elsewhere been described as the upward counterfactual effect, (McMullen, 1997). McMullen proposed that the upward counterfactual effect arises when in evaluation mode, where comparison are made which invoke how things could be better which results in negative affect (affect contrast). These findings are consistent with other researchers who have also noted the effect of thinking styles on mood. For example Watkins *et al.* (2008) found that an analytical thinking style *'thinking about self, focusing on discrepancies between current and wanted outcomes'* (p 1039) was characteristic of maladaptive ruminative processing. Similarly Rude *et al.* (2007) found that brooding was more strongly associated with depression and anxiety compared with reflection.

The ability of attentional manipulation, an aspect of PMT, to disable negative evaluation and therefore increase suggestion has already been described in Section 1.8.5.4. Thus it was hypothesised that the relaxation condition would have a greater effect on absorption of positive suggestions, compared with the suggestion only condition. This it is argued, being a result of individuals having a less evaluative processing mode and therefore more able to overcome the upward counterfactual effect, that has been experimentally observed in the studies of Holmes *et al.* (2009)

> *Hypothesis 3: Self-esteem suggestions given with relaxation (heightened suggestion) would be more effective, as demonstrated by higher levels of self-esteem, positive affect and cognitive bias, compared to self-esteem suggestions alone and control.*

Additionally, Gandhi and Oakley's research, comparing hypnosis with imaginative suggestion, suggested that relaxation per se may increase suggestibility. Research has not, to this author's knowledge, compared suggestion plus relaxation with suggestion without relaxation.

In order to test these hypotheses one track (a self-esteem track) from PMT was reconstructed into two separate experimental conditions 1) a relaxation induction plus self-esteem suggestions (named heighten suggestion, (HS) and 2) self-esteem suggestion, without a relaxation induction, (named suggestion only, (SO). To match the recordings for length the self-esteem only recording was repeated. These conditions were compared to each other and also to a control condition, which was a suggestion free recording about the weather and the University of Edinburgh, matched for voice, pace and length (described in section 12.7.3.3).

To further test the idea that the conditions would be effective at reducing emotional vulnerability, emotionally vulnerable participants were identified from isolating subsets of participants, from the highest and lowest percentiles of the anxiety and depression scales, for statistical analysis. Adopting this analogue research design is recognized as a useful strategy for experimental designs that would otherwise require substantial sample sizes (Stopa & Clark, 2001). It was proposed that emotionally vulnerable individuals would show a greater response to the conditions than those with lower social anxiety and depression scores.

There is some evidence that self-esteem conditions delivered in this study may have a greater impact on those with higher levels of emotional vulnerability as this self-esteem condition resulted in increases in positive affect and specific memories in participants with increased depressive vulnerability, compared to those with no depressive vulnerability (Dobbin *et al.* under review).

Hypothesis 4: Those with emotional vulnerability (as defined by high scores in social anxiety and depression measures and low resilience measure) would exhibit a greater response to the heightened suggestion condition compared to the suggestion only condition.

12 Method

12.1 Research Design

An experimental design was adopted with three dependent variables - a cognitive bias (CB) measure, a mood measure (positive and negative affect) and a self-esteem measure. There were three between group factors (independent variables) - suggestion only (SO), heightened suggestion (HS) and a control. Additionally three variables were measured at the baseline only - resilience, social anxiety and depression. Participants were not informed of the cognitive bias modification and resilience testing aspects of the study until after the study. Participants and researcher were blinded to control and intervention condition. Full ethical consent was given by the University of Edinburgh as described below.

12.2 Ethics and Ethical Considerations

Ethical issues were addressed to the satisfaction of the University of Edinburgh's School of Health in Social Science (see appendix 5.1) and included the following experimental design considerations:

1. Safeguarding Participants

   I.   Participants were self-selected volunteers and not clinically vulnerable people. However although exclusion criteria requested that volunteers were not on medication which may have interfered with mood modification, such as anti-depressant drugs, beta blockers and anti-psychotic medication (dopamine antagonists), there would have been no danger to these people if they had inadvertently participated. They were excluded as their participation may have skewed results.

   II.   The study design included induction of a low mood. This was carried out following established procedures from other researchers and accordingly, at the end of the study period, low mood was countered with a funny/happy film.

Participants were also debriefed at the end of the study period and given the number of the University counselling team. However no participants complained about the study, became distressed or left the study before it had finished. All research booklets were fully completed indicating participant compliance with the study.

2. Minimising Bias

I.   Participant bias was addressed by participants being quasi-randomly allocated to experimental condition, i.e. randomisation was subject to some modification to ensure equal numbers in each condition (described in more detail below)

II.   Intervention bias was addressed by matching the interventions as closely as possible.

III. Researcher bias – the researcher was blinded to which condition the participants were allocated to, through the experimental conditions being attributed A, B or C by another individual and this code only being given to the researcher after the data set was fixed. The researcher did not hear which condition each group listened to as the participants in the groups were listening through headphones.

IV.   This was an academic study investigating components of an intervention. It was not a clinical study. There was no specific advantage to any outcome of the study. The aim was to contribute to knowledge about cognitive processes. However it was acknowledged, that the researcher had an interest in the intervention, on which the components under study have been based, as she produced the intervention (see Section 2.1.1). Researcher bias has been addressed in point 5 above and was carefully adhered to. The need for transparency was fully understood and has been addressed in study design. The study as part of a PhD at the University of Edinburgh, Section of Clinical & Health Psychology, is also under the academic guidance and rigor of this institution.

12.3 **Participants**

Students from Edinburgh University were invited to participate in the study and were required to be native English speakers and able to easily read English and hear/ understand the spoken word. Additionally, because the study was about mood, students were requested not to participate if they were on medication which may affect mood, eg anti-depressants or betablockers.

12.4 **Recruitment**

Participant recruitment was via an advert placed on Edinburgh University's intranet. There was a standard template for this and the study was listed as 'Paid PhD Research Participants' and described as:

You will take part in a study investigating the effects of suggestion on mood. The study will last no longer than 60 mins and consists of a simple word order task,some short mood questionnaires, and listening to a recorded audio track. In addition you will also watch a short sad video clip (3mins), and a short funny video clip. You must be a native English speaker and able to easily read English and hear/ understand the spoken word. Because the study is about mood, you cannot participate if you are on medication which may affect mood, e.g. anti-depressants or betablockers.

The advert also stated that participants would be paid £6 and students were asked to email the researcher for further information. On receipt of a potential participant's email the researcher replied with further details of when and where the study was taking place and also a copy of the participant's information letter, which followed the National Research Ethics Service guidelines ((NRES)) (see appendix 5.2). Participants were requested to email back if they were still interested in taking part.

Participants were given a choice of days, times and venues and asked to choose the time slot which suited them best. They were allocated on a 'first come, first served' basis. Group size was capped at 20 as there were only 20 headsets.

12.5 **Allocation**

Participants' assignation to condition was a two-step process. Firstly participants were allocated to a group, taking into account their timetabling restrictions and the research requirement for full groups. Subsequently a research condition was pseudo-randomly allocated to each group on a sequential basis, with potential modification based on ensuring equal numbers of participants in each condition.

12.6 **Setting**

The main criteria for the study setting was that it was a room which was reasonably quiet, carpeted, with sufficient space for participants to sit or lie down comfortably on the floor. This was to enable participants to relax as much as possible when listening to the 15 minute audio track. To further facilitate this, cushions were available for participants to sit on. Two settings were used: A room in one of the university buildings, which is commonly used for student societies, and a room in a nearby private yoga school. The former was chosen as it had good availability, was bookable for whole days, and was carpeted and empty of furniture. The latter was chosen as it was more centrally located, also empty of furniture and had mats on the floor.

Radio controlled headphones were used so that each participant in a group was listening to the same recording, at the same time whilst having an individual listening experience, with less distractions from others and the outside environment.

12.7 **Materials**

12.7.1 Intervention conditions

There were 3 intervention conditions, all audio recordings, each lasting 15 minutes.

1. Condition 1 consisted of a 7 ½ minute relaxation induction followed by 7 ½ minute positive suggestion (self-esteem) script.
2. Condition 2 was the positive self-esteem suggestion only condition and in order to match this for length and number of words, the suggestion script was repeated twice.
3. Condition 3 was a control condition and consisted of neutral information about Scottish weather for 7 ½ minutes followed by 7 ½ minutes of information about Edinburgh University.

Each condition then consisted of 2 sub units, each matched for number of words and length of delivery.

12.7.2 Schematic representation of Intervention Conditions and Control

Condition 1	Relaxation Induction = 7.5mins	+	Positive Suggestion = 7.5mins
Condition 2	Positive Suggestion = 7.5mins	+	Positive Suggestion = 7.5mins
Control condition	Scottish weather = 7.5 mins	+	Edinburgh University = 7.5 mins
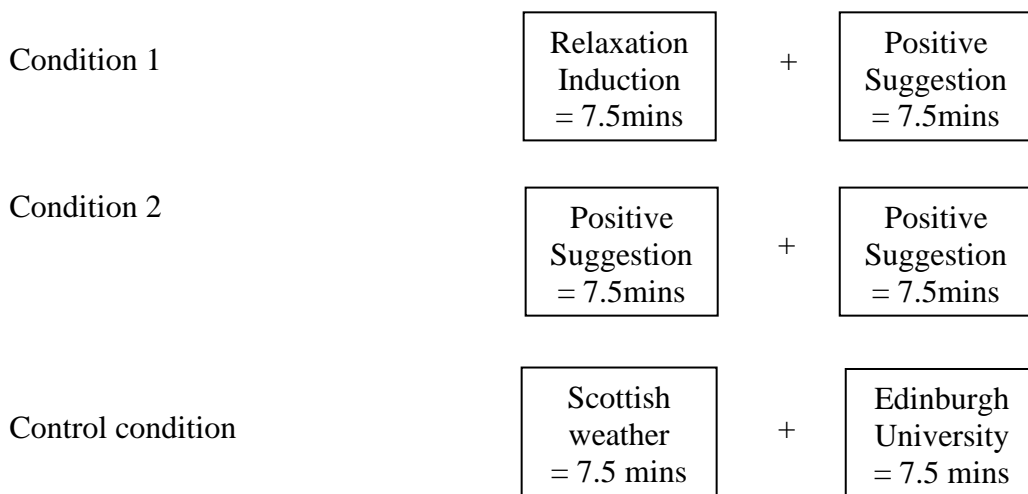
Figure 12:1 *Schematic representation of each experimental condition showing matched structure and timings in each condition*

The conditions were recorded using a Newmann U89i multi pattern microphone onto a pc using adobe audition software. Recordings were made using this researcher's voice (female) and matched for tone, pitch and speed of speech. The music from the original intervention was removed so as to isolate the impact of the words.

Furthermore Standage *et al.* (2010) reported an increase in positive CB from listening to music and so may have been a confounding factor if kept.

12.7.3 Condition Scripts

The structure of each condition is presented in Figure 9.1 above. Each condition was matched for time and number of words; started with the same instructions - '*Sit or lie down and make yourself as comfortable as possible*' followed by an instruction' *to close your eyes';* and finished with the same words - *'So go ahead now and open your eyes and continue with the next task'.*

A short description of each component follows. Full scripts of each condition can be read in Appendix 5.3.

12.7.3.1 Relaxation Induction

The relaxation section included asking the listener to notice their breathing, to develop slow diaphragmatic breathing with an experiential focus, for example '*as you breathe out follow your breath out, as you breathe in you are aware of your body, as you breathe out you are calming your body'* and to notice that their mind was relaxing and their thoughts '*float away'.* The listener was asked to be aware of the relaxation developing throughout their whole body, scanning their mind through their body, toes, feet, legs, back, arms, head and face, ' *allowing any thoughts to drift by,...feeling calm, relaxed, safe and secure'.*

12.7.3.2 Self-esteem Suggestions

The self-esteem suggestions were introduced as '*a few pictures and suggestions that will help you increase your self-confidence, ...look at yourself in a more positive way, ...to value yourself even more ..to build up your self-image.'* The suggestions were all positively expressed and focused around increasing positive feelings and skills, and placed in the future, for example *'your thoughts will be calmer and clearer'* and *'you'll*

be more effective and resourceful'. Many suggestions were also reappraisals, to see things differently, such as *'you'll experience that you'll grow as a result of difficulties', you'll experience problems as solutions'.* The listener was also given the opportunity for visualised behavioural activation through picturing him/herself *'in some future situation and see how your increased self-confidence enables you to handle this situation better than you ever have before'.*

12.7.3.3 Control Condition

The control condition consisted of a section about Scottish weather and a section about Edinburgh University (Weather, 2011; Wikipedia, 2011) The information for these sections was sourced from the internet and was chosen to be affect neutral and not personal. Facts were given such as '*it is normal to experience both blazing sunshine and rain all in one morning, thanks to being in the path of several major weather systems'.* Seasons and weather related activities were described, for example '*frosts are common in winter'* and due to the wind Scotland is *'an excellent location for sailing'* (Weather 2011). The University section similarly focused on facts, for example *'It was the fourth university to be established in Scotland'* and described the buildings and structure of the university, for example ' *. is one of the largest academic library buildings in Europe, and was designed by Basil Spence and in 2002 the University was re-organised from its 9 faculties into three 'Colleges'* (Wikipedia, 2011).

12.8 Procedure

Powerpoint presentations were used to structure and deliver each experimental session. This minimised intra and inter session variability through controlling each step of the research process, ensuring the group moved on to each stage together. The video and audio materials were embedded within this presentation so that the sequence ran smoothly and was the same for each group, with the exception of each group having

the appropriate condition. Powerpoint presentations were labelled A, B or C which referred to the different research conditions, which had been allocated by an independent person. This ensured the researcher and participants were blinded to the condition within each group. The powerpoint presentations were shown on a wall projected from 3 feet away.

Experimental data collected was in the form of self-completed questionnaires, which were compiled into a research booklet (see Appendix 5.4). Each group was introduced in the same way and given the same instructions. The role of the researcher was controlled by having a script for the experimental procedure for the groups, which was the same for each group. This process ensured minimal influence and bias from the researcher and therefore minimum inter-group variability.

At the start of each session each participant was given a research booklet and headphones, asked to sit down, complete the consent form and check their headphones. The group was then taken through the powerpoint presentation which contained instructions to complete questionnaires, listen to music and watch videos (see Appendix 5.5)

12.9 **Measures**

12.9.1 The Scrambled Sentence Test (SST)

The Scrambled Sentence Test (Wenzlaff, 1993) is a self-completion test to measure cognitive processing bias. It is frequently used in cognitive bias studies (e.g. Standage *et al.* 2009; Watkins & Moulds 2007; Rude *et al.* 2003). Participants are asked to make a sentence with 5 of the 6 words randomly presented in an ungrammatical form. The words are such that it is possible to make either a positive or negative valanced sentence, e.g. *'faults notice other merits my people'* could be unscrambled to be *'other people notice my faults'* (negative bias) or *'other people notice my merits'* (positive bias). The sentences used were those from previous researchers (Standage *et al.* 2010) which were based on items from the Fear of Negative Evaluation (FNE) and Social

Avoidance and Distress (SAD) scales. Adopting Standage's protocol, participants were given 20 sentences to unscramble, by indicating the sequence of each unscrambled sentence with numbers 1 – 5, written above five of the six words, in a time limit of 4 minutes. Instructions for completing the task were verbally given, as well as being written in the research packs (see Appendix 5.4) and were;

Unscramble the sentences to form statements, not questions. Each sentence can be unscrambled into more than one statement, but you should choose only one statement to unscramble. Unscramble the sentences to form whatever statement comes to mind first. Work as quickly as you can because your time will be limited. Do not correct errors. If you make a mistake simply move on to the next item.

Participants were given 3 neutral practice sentences before the start of the timed task. Additionally, as in prior use of the SST (Rude *et al*. 2003), a cognitive load was also given, i.e. to remember a 6 digit number, as a way of compromising participants' ability to suppress negative solutions. A number was presented on a screen for 10 seconds immediately before the task started and participants were requested to hold this number in mind as they would be asked to write it down at the end of the allotted time. The SST was repeated after the intervention conditions using a different number to memorise and a different set of 20 scrambled sentences, again taken from Standage *et al.* (2010).

The SST is scored by producing a 'negativity' score for each block of 20 sentences. This is produced by calculating the ratio of negative sentences over total sentences completed. Incomplete, unfinished, wrongly completed (i.e. using less than or more than 5 of the 6 possible words) and corrected sentences were excluded from the total number of sentences completed.

Two sources of error were identified for scoring the SSTs. These were interpretation errors, i.e. whether a sentence is positive or negative, and counting errors of negatives and/or completed sentences. Methods were employed to reduce the likelihood of these errors occurring. A SST scoring guideline was used to ensure consistency of interpretation and additionally scoring was carried out by two people, this author and a colleague experienced in research methods, one reading out the sentences and both

agreeing the interpretation and the count of negatives and completed sentences. Scoring was carried out in short bursts for maximum freshness and good concentration.

12.9.2 The State Self-Esteem Scale (SSES)

This scale is a psychometrically validated, self-reported, measure of state self-esteem (Heatherton & Polivy, 1991). It consists of 20 questions, rated on a 5 point Likert scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, 5 = extremely). Instructions highlight current feelings of self-esteem, by asking participants to complete how they feel at *this moment, right now*. Internal validity for the scale has been reported (Heatherton & Polivy, 1991) with a Cronbach's alpha = .92. The scale has a high degree of construct validity as seen by significant correlations with, for example, the Rosenburg Self-esteem Scale ($r = .72$, $p < .05$, n = 102), Janis-Field Feelings of Inadequacy Scale (r =.76 , p <.05, n = 102), and Beck Depression Inventory ($r = -.71$, $p < .05$, n = 102).

The SSES has 3 independent factors relating to separate aspects of self-concept - which are appearance, social and performance. Heatherton & Polivy (1991) have demonstrated that the scale is responsive to treatment programmes and experimental conditions and these authors suggest that it is appropriate to use specific subscales (depending on the experimental treatment being examined) to gauge the effectiveness of a specific manipulation. Therefore, following Gruenewald *et al*. (2004) the social subscale and the performance subscale were used in this study to confirm the impact of the positive suggestions on self-esteem. The social subscale has good internal consistency (Cronbach's alpha = .87), and contains items such as '*I feel self-conscious*'. It has been shown to be sensitive to social anxiety manipulations. The performance subscale has similar properties (e.g. Cronbach's alpha = .89), and contains items such as '*I feel confident about my abilities*', and has also been shown to be sensitive to experimental manipulations.

Each of these subscales has 7 items, resulting in a 14 item scale. There were four reverse scored items in the performance subscale and all seven of the items in the social subscale were reverse items. Following reversals, the individual item scores were

added together to give self-esteem subscale scores, ranging from 7 - 35. The higher the score the greater the self-esteem.

12.9.3 Positive and Negative Affect Scale (PANAS).

The brief form of this scale was used to assess state mood (emotion). This is a validated, frequently used, self-assessment scale, (Watson *et al*. 1988) which has two subscales, positive affect (PA) and negative affect (NA), each consisting of 10 affect items which are rated on a 5 point likert scale from (1 = very slightly or not at all, to 5 = extremely). The negative items are *afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, upset* and the positive items are *active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, strong*. Watson *et al.* (1988) showed that this scale was sensitive to fluctuations in mood when the time scale '*right now*' was used and that the scale had good external validity as demonstrated by strong correlations with similar constructs, e.g. with Diener & Emmons (1984), PA and NA measure (PA: $r = .95$, and NA: $r = .91$, n = 301, (Diener & Emmons, 1984). Internal consistency of the subscales has been demonstrated with Cronbach's alphas of .89 for PA and .85 for NA (Crawford, 2004). Crawford also confirmed that PANAS scores did not significantly influence gender, occupation, education and age.

In addition to these original PANAS items, 4 positive items were added (*cheerful, satisfied, relaxed, self-assured*) to extend the range of positive feelings to encompass those which may be produced by the positive suggestion condition. These items have previously been added to assess positive affect (Ong *et al.* 2006). Also additionally to assess sadness, to enable a check on the mood manipulation procedure, and following previous researchers (Philippe *et al.* 2009), 4 additional negative affect items were added – *sad, depressed, discouraged, despondent*.

Accordingly in this study a 28 item PANAS scale was used. Negative affect items were summed to give an overall NA score, and positive affect items were summed to give an overall PA score, each subscale ranging between 14 – 70.

12.9.4 The Connor Davidson Resilience Scale (CDRISC)

This scale was used to assess trait resilience. The shortened 10 item scale (Campbell-Sills & Stein, 2007) was used, as it was used in this author's primary study, see Section 3.4.2. It has been psychometrically validated and was used for baseline psychometric data for correlation and hypothesis testing.

12.9.5 The Social Phobia Inventory [SPIN]

This is a validated, self-assessed measure of social phobia (Connor *et al.*, 2000). The scale was developed from the Brief Social Phobia Scale; an observer rated scale, and assesses fear, avoidance and physiological symptoms. Connor *et al.* (2000) demonstrated sound psychometric properties. Good internal validity was shown, with Cronbach's alpha = .82 for healthy volunteers and .94 in a socially anxious group. External validity was demonstrated with for example, the Brief Social Phobia Scale (Davidson *et al.* 1997), (r=0.57, p<.0001, n = 67) and Liebowitz Social Anxiety Scale (Liebowitz, 1987), (r = 0.55, p<.0001, n = 67).

The SPIN scale has 17 items. Participants rate how much they agree with the statements, e.g. *I have a fear of people in authority*, on a 4 point Likert scale, from 0 not at all to 4 extremely. Each item score is summed to give a total SPIN score, ranging from 0 - 68; the higher the score the greater the social anxiety. Connor *et al* (2000) suggested a cut off score of 19, with scores above this indicating social phobia.

Although Connor *et al.* (2000) demonstrated the SPIN was responsive to change over time, it is included here as a means of identifying socially anxious individuals. Previous researchers have used this scale to isolate, from within healthy volunteer participants, cohorts of high and low socially anxious participants, taking the higher and lower 16% (Tsunoda *et al.*, 2008). This study adopted this design to give high and low 'SPIN' groups for statistical comparison and hypothesis testing.

12.9.6 Depressed Mood

A short version of the Beck Depression Inventory (BDI: Philippe & Vallerand, 2008; see also Beck *et al.*, 1961), composed of three items rated on a 4-point scale (ranging from 0 to 3), was used. This was primarily chosen as it was short, has good psychometric properties and, similar to the SPIN scale, was included to provide subsets of high and low depressive vulnerabilities. This short scale correlates highly with the full-version of the BDI ($r = .73$). It has been used successfully in other studies, (e.g., Philippe & Vallerand, 2008; Philippe *et al*. 2009; Dobbin *et al* under review), showing good validity and reliability, e.g. a Cronbach's alpha coefficient of .71. The 3 questionnaire items each relate to depressive symptoms, that is, past failure, self-dislike, and pessimism. Each item has a choice of 4 statements, scored 0 – 3, e.g. 0 - I do not feel like a failure; and 3- I feel I am a total failure as a person. Each item score is summed to give a total short BDI score, ranging from 0 – 9. Based on the full BDI scores, a score above 2 corresponds to a mild depressive level.

12.9.7 Filler Task

Previous researchers (Holmes *et al.* 2006, Standage *et al.* 2010) have reported that CBM has an effect on mood, as measured by PANAS. Following procedures adopted by Holmes *et al.* 2009, a filler task was given to allow for any mood effect from the CBM experimental conditions to dissipate, ensuring all condition groups had similar mood prior to the negative mood induction. The filler task involved a sham task of listening to a series of four classical music extracts each lasting 40 seconds and participant were asked to rate these on a scale 1 (extremely unpleasant) – 9 (extremely pleasant). Overall this task lasted for 2 minutes 40 seconds, and although Holmes *et al.* had a filler task of 10 minutes, other researchers (Hayes *et al*. 2010) have used filler tasks of 2 minutes.

The music used in this task was extracts from the following:
1. Albinoni - Oboe Concerto
2. Mendelssohn - Scottish Symphony

3. Stephan Grapelli - guitar solo
4. Costa Rican local artist - solo guitar

12.9.8 Negative Mood Induction

A mood challenge was used to test for the ability to retain positive affect under stress. Generation of positive emotion in response to negative emotion induction has been found to be a feature of resilience (Philippe *et al.* 2009; Ong *et al.* 2006).

A meta-analysis of mood induction procedures has found that film clips are effective at producing both positive and negative moods (Westermann *et al.* 1996) and resilience has been shown to be relevant in overcoming loss and grief (Bonanno *et al.*, 2004). Accordingly a sad film clip was used to induce a negative mood (You Can Count on Me) (Longergan, 2000). This is a short film clip lasting 4.12 min, and depicts two parents who suddenly die in a car accident, followed by another scene showing two children crying during their parent's funeral ceremony. This clip has been successfully used by previous researchers to induce sadness (Philippe *et al.*, 2009) and was shown after the intervention conditions, and a filler task, as shown schematically in the flowchart.

12.9.9 Positive Mood Induction

Following the negative mood procedure, a positive mood was induced following previous researchers methods i.e. a funny film clip (Tice *et al.* 2007). This was to counteract any negative mood that has been induced by the sad film clip. The funny film clip was a you tube clip, showed a 'talking dog' who was having a conversation with his owner (unseen) about the contents of the fridge. The dialogue formed a joke, the punch line was that the food was given to the cat. The clip was 1.06 min long and usually caused participants to laugh or chuckle. Additionally participants were debriefed by the researcher.

12.9.10   Manipulation Check Ratings

Adapting procedures recorded by Holmes *et al.* (2009) 4 rating scales were included after listening to the conditions. Responses were rated on a 9 point Likert scale from 1 (*not at all*) to 9 (*all the time*). Questions 1 and 2 were cognitive processing checks, as used by Holmes *et al.* (2009) and are included as these researchers found that imagery, compared to verbal analysis, significantly increased positive CB. Imagery is also associated with an experiential mindset (Norris & Epstein, 2011) and also hypnosis (Gruzelier, 1998) and therefore this question was included to test whether the HS condition did result in greater imagery. Question 2 was included as an alternative 'thinking' mode to question 1. Questions 3 and 4 were manipulation checks to assess the degree of relaxation and mind wandering.

1   How much did you find yourself thinking in images i.e. in mental pictures and sensory impressions?

2   How much did you find yourself verbally analysing the meaning of the words?

3   How much of the time did you find your mind wandering or daydreaming?

4   How relaxed did you feel?

12.10   Sample Size

Previous researchers (Standage *et al.* 2010) using the SST as an indicator of CBM reported means and standard deviations of significant differences *between* experimental groups, and *within* experimental groups. In that study, a group with positive self-referential socially themed statements were compared with a group with negative self-referential socially themed statements. It was found that those with the positive statements significantly increased the number of positive resolutions of the SST over time (i.e. pre and post the CBM procedure) [$t(13) = 2.83$, $p<.05$] and those with the negative statements conversely significantly made less positive resolutions of the SST over time [$t(13) – 2.52$, $p< .05$]. ANOVA also revealed a significant

interaction between group and time [$F(1,26) - 12.5$, $p < .01$, $\eta^2_p = 0.33$]. A partial eta squared (η^2_p) effect size of 0.33 is equivalent to a large effect size (MRC, 2009).

Similarly Holmes (Holmes *et al.* 2009) reported means and SD of participants tested with SST and PANAS. In these experiments the researchers compared two groups, who received CBM instructions, one receiving a verbal condition and one receiving an imagery condition. They found a significant difference between the two group's SST negativity scores [$t(36) = 2.37$, $p < .05$, $d = 0.77$]. These researchers also investigated the response to a negative mood induction and found with ANOVA that the PANAS (positive affect subscale) showed a significant interaction of time and condition, [$F(1.38) = 6.16$ $p < .05$ $\eta^2_p = 0.14$] equivalent to a medium-large effect size.

Although in the Holmes *et al.* (2009) and Standage *et al.* (2010) studies large effect sizes were reported, it was considered advisable in this present study to expect a medium effect size, as the conditions being compared both employed positive suggestions (unlike Standage *et al.* who compared negative with positive) and it was expected that both intervention conditions in this study would show a positive increase in CB.

As there was a control group, a 3 group ANOVA was carried out. According to Cohen, (1992), a 3 group ANOVA, at a power of $= .80$, $\alpha = .05$, and a medium effect size, (ES), a group size of 52 participants is required. Therefore it was calculated that a minimum of 156 participants in total would be required.

12.11   **Research Protocol**

Groups were arranged between 7th October 2011 – 21st October 2011.

205 students were invited to participate in the study. 40 did not attend their allocated research time. 165 students participated in the research and were allocated as outlined

in Table 12.1, below. The total number of participants in each group was 57 in Group A, 55 in Group B, 53 in Group C. A flowchart of the research procedure is shown below, in Figure 12:2: Schematic flowchart of the study indicating timing of each section and participant numbers.

Table 12:1 *Detail of groups, by experimental condition, showing number attended and number of 'Did Not Attend' (DNA)*

Group	A (suggestion only)	B (heightened suggestion)	C (control)
Number of participants	57 (18 DNA)	55 (11 DNA)	53 (11 DNA)

12.12　**Flowchart of Study**
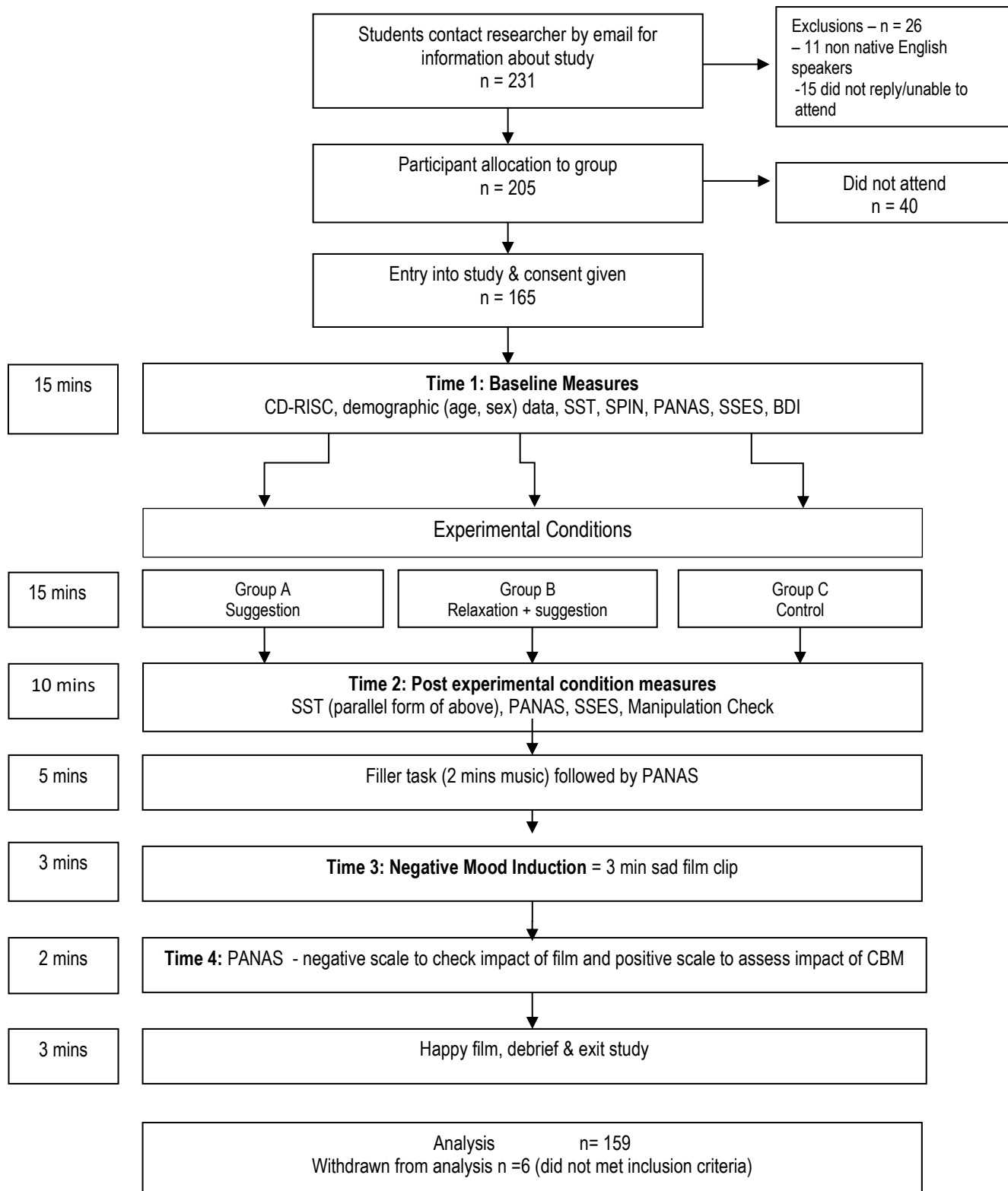
Figure 12:2 Schematic flowchart of the study indicating timing of each section and participant numbers

The research procedure for participants lasted 53 mins, as outlined in the flow chart. The procedure was piloted on 5 volunteers.

12.13   Analytic Plan

1. Data was screened for data input errors, missing data, outliers and assumptions of normality were tested.

2. Baseline demographics were compared by t tests

3. Manipulation checks were carried out on:
   a. The experimental conditions manipulation questions were compared by t test for aspects of imagery and relaxation.
   b. Mood levels across conditions, after the filler task and prior to the negative mood induction, were compared by t test, to check there was no significant difference in mood between groups.
   c. The mood induction procedure was checked for induction of low mood by comparison of mean differences (repeated measures t test) between the PANAS negative affect subscale pre and post negative mood induction.

4. The effect of the experimental conditions on CBM was assessed by carrying out individual repeated measure ANOVAs for each of the dependent variables – i.e. SST, PANAS (positive subscale), SPIN, SSTS - pre and post experimental condition. Within group factor was Time (pre and post scores) and between group factor was condition (independent variables).

5. High & low SPIN and BDI cohorts were isolated and examined separately to test the hypothesis that these groups would show a greater response to the conditions.

6. The effect of condition on protection against mood deterioration during a negative mood induction was assessed by comparison of the PANAS positive subscale scores before and after the low mood induction, by repeated measure ANOVA. Within group factor was Time (pre and post scores) and between group factor was condition (independent variables).

13 Results of Study 3

Data was analysed using PASW version 17.

165 participants entered the study. 6 participants were removed as they were deemed to be non-compliant with participant recruitment requirements, i.e. able to read and understand English; evidenced in their very low percentage of correctly completed sentences in the first scrambled sentence test. This left a dataset of 159 cases.

13.1 Missing data

The data set was examined for missing data.

5 participants had wrongly completed their scrambled sentence test (SST) (they had written out the sentences) and therefore were scored as missing. This equated to 3.56% missing SST data.

Single missing questionnaire items were also identified. These equated to 0.06% missing questionnaire item data. As is the convention with less than 5% missing data, (Field, 2009) missing cases were imputed with the mean or median, depending on the variables level of measurement.

13.2 Participant characteristics

Demographic and psychological variable data of the groups is shown in Table 13:1 Characteristics of Participants, below.

Table 13:1 Characteristics of Participants

Characteristics	Group A Suggestion only (SO) (n=56)		Group B Heightened Suggestion (HS) (n=53)		Group C Control (C) (n=50)	
	M	SD	M	SD	M	SD
Age (years)	21.32	3.65	21.34	3.23	22.16	3.23
Range	17-33		18-33		18-35	
Gender (%)						
male	34		32		26	
female	66		68		74	
Nationality: (%)						
British	71.4		58.5		78	
N..American	10.7		24.5		14	
European	8.9		3.8		4	
Indian	5.4		1.9		2	
Asian	3.6		3.8		2	
Other*	0		7.5		0	
Anxiety (SPIN)	20	10.05	21.85	11.45	21.22	13
Depression (BDI_s)	1.29	1.41	1.44	1.75	1.64	1.88
Resilience (CDRISC)	26.88	6.43	28.25	5.11	26.64	5.93

SPIN – Social Anxiety scale, CDRISC –Connor-Davidson Resilience scale, BDI_s – Becks Depression Inventory -shortened

*(Egyptian, Slovakian, Argentinian, Trinidadian)

13.3 Comparison of Baseline Characteristics

Groups were compared, in terms of gender, a categorical variable, therefore the chi squared test was used χ^2 (2, n=156) = 0.84, $p > .05$; age, Kruskal-Wallis test was used as distribution was non normal, χ^2 (2, n=156) = 4.18, $p > .05$; and nationality, the Fisher's exact test was used as assumptions of a chi squared test were not met (i.e. the expected frequency in each cell was not greater than 5), χ^2 (n=156) = 13.41 (1), $p > .05$. These results showed that there was no significant difference between group demographics.

13.4 **Variable Characteristics at baseline**

Baseline variable data was compared across the three groups. Mean, standard deviation, minimum and maximum scores are shown in Table 13:2: Variable characteristics at baseline for each condition, below. In addition, skew, kurtosis and calculated z scores for each group are presented in Appendix 6.1.

Table 13:2 Variable characteristics at baseline for each condition

	Group A (SO)				Group B (HS)				Group C (Control)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
SST	0.33	0.19	0.00	0.84	0.33	0.18	0.06	0.70	0.34	0.17	0.00	0.78
Positive Affect	41.75	9.06	28.00	64.00	41.19	8.92	26.00	62.00	41.72	9.59	25.00	62.00
Negative Affect	20.12	6.59	14.00	41.00	20.74	7.22	14.00	45.00	19.28	5.16	14.00	37.00
SSES_s	27.96	5.33	11.00	35.00	25.58	6.00	11.00	34.00	27.06	5.74	11.00	35.00
SSES_p	26.41	5.01	12.00	34.00	26.40	5.09	16.00	34.00	27.18	5.35	11.00	43.00
SSES	54.37	9.31	30.00	68.00	51.98	10.10	27.00	67.00	54.24	9.09	32.00	69.00
SPIN	20.00	10.10	3.00	44.00	21.85	11.50	0.00	44.00	21.22	13.00	2.00	47.00
CDRISC	26.88	6.43	14.00	40.00	28.25	5.11	18.00	38.00	26.64	5.93	11.00	37.00
BDI_s	1.29	1.41	0.00	5.00	1.44	1.75	0.00	8.00	1.64	1.88	0.00	9.00

SST– Scrambled Sentence Test ; SSES_s – State Self-esteem Scale social subscale; SSES_p – State Self-esteem Scale performance subscale; SSES – total State Self-esteem Scale; SPIN – Social Phobia Inventory; CDRISC – Connor Davidson Resilience Scale – 10 item ; BDI_s – Becks Depression Inventory -shortened

Variable skew and kurtosis z scores, shown in Appendix 6.1, were calculated, in order to estimate the degree of normality of distribution of each variable at baseline in each group. The majority of variables had z scores within the range of normality. A significant value of non normal distribution was deemed to be greater than 2.58, $p<0.01$ as the sample size is moderate (Field, 2009, p. 139). SSES subscales were within this level in groups C and B, and within the $p<0.001$ (absolute value of below 3.29) for group A. As ANOVA's are known to be fairly robust when conditions are violated (Field, 2009, p. 359) parametric statistical tests were used with the SSES variables.

Both the Negative Affect and the shortened BDI in group C, B, A had non- normal distribution with z scores > 2.58 or >3.29. These non-normally distributed variables were examined for outliers. BDI had two outliers and as this scale was to be used to for subgroup analysis based on percentiles, the non-normal distribution had little influence on this.

Negative Affect over the 4 time measures showed skewed distribution. Each time point had several outliers, for example there were 9 outliers at time 1, shown below, in Figure 13:1 Boxplots of Negative Affect at time 1, and similar patterns at time 2, 3 and 4. Transformations were performed but did not sufficiently improve the normality of the distribution to warrant their use. It was therefore decided to windsorise the outliers and to use parametric tests for this variable, as an ANOVA is reasonably robust to skew with equal group sizes.
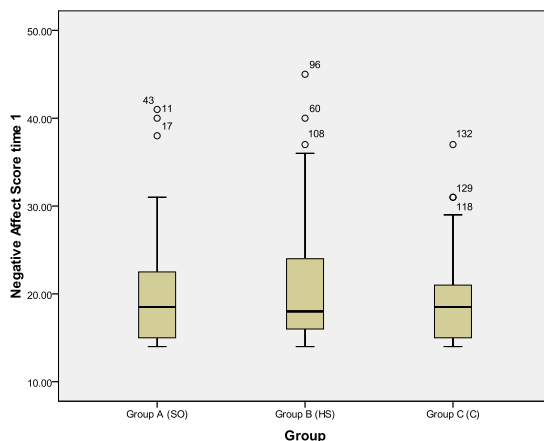
Figure 13:1 Boxplots of Negative Affect at time 1; showing outliers

13.5 **Comparison of Variables at Baseline**

The variables were analysed for statistical difference between the groups at baseline with an ANOVA, with group as fixed factor and variables as dependent factors. Levene's test for homogeneity, reported in the Appendix 6.2, was not significant in all variables with the exception of the SPIN (social phobia variable) where F (2,156) = 3.65, $p<$ .05. As the group sizes are even it was assumed this had minimal impact on the ANOVA.

Results of the between group analysis are shown in Table 13:3: Results of ANOVA analysis for each variable compared across groups at baseline, below, and show that there were no statistical differences between the groups at baseline.

Table 13:3 Results of ANOVA analysis for each variable compared across groups at baseline, showing no significant difference between groups

Variable	$F_{(df\ 2/156)}$	Sig.
Scrambled sentence test	0.10	0.91
Positive Affect	0.05	0.95
Negative Affect	0.67	0.52
SSES social subscale	2.42	0.09
SSES performance subscale	0.39	0.68
SSES total	1.06	0.35
Social Anxiety (SPIN)	0.37	0.70
Resilience (CDRISC)	1.15	0.32
Depression (BDI_s)	0.27	0.77

df = degrees of freedom, SSES – State Self-Esteem Scale

Table 13:4 Mean and Standard Deviations for Bias Measure, Mood measures, Self-esteem measure and manipulation checks per condition

measure	Group A Suggestion only (SO) n = 56		Group B Heightened Suggestion (HS) n = 53		Group C Control (C) n = 50	
	M	SD	M	SD	M	SD
Cognitive Bias measure						
SST , time 1	0.33	0.19	0.33	0.18	0.34	0.17
SST , time 2	0.26	0.19	0.27	0.17	0.27	0.15
Mood measures						
PA, time 1	41.75	9.06	41.19	8.92	41.72	9.59
PA, time 2	41.07	12.60	41.21	1.21	36.26	11.06
PA, time 3	41.5	11.43	41.17	11.16	38.16	11.05
PA, time 4	35.80	11.37	34.00	10.76	31.40	11.24
NA, time 1	20.12	6.59	20.74	7.22	19.28	5.16
NA, time 2	17.66	4.98	17.68	7.21	17.32	4.37
NA, time 3	16.46	4.57	16.77	4.72	16.46	3.62
NA, time 4	19.89	7.21	20.17	5.74	20.38	5.63
Self-esteem measure						
SSES time 1	54.37	9.31	51.97	10.12	54.24	9.09
SSES time 2	58.02	8.55	57.09	9.79	56.42	9.93
SSES_p time 1	26.41	5.01	26.40	5.09	27.18	5.35
SSES_p time 2	26.64	4.51	28.43	4.83	27.64	5.18
SSES_s time 1	27.96	5.33	25.58	6.00	27.06	5.74
SSES_s time 2	29.45	4.94	28.66	5.62	28.78	5.88
Manipulation checks						
Imagery	3.55	1.93	3.98	2.28	5.76	2.20
Analytical	5.05	2.35	4.58	2.56	4.22	2.21
Mind wandering	5.73	2.01	5.96	1.89	5.5	1.99
Relaxed	6.54	1.84	6.81	1.67	6.72	1.50

Time 1 = baseline, Time 2 = post intervention, Time 3 = pre mood induction, Time 4 = post mood induction

SST– Scrambled Sentence Test ; SSES_s – State Self-esteem Scale social subscale; SSES_p – State Self-esteem Scale performance subscale; SSES – total State Self-esteem Scale; PANAS NA negative affect scale; PA positive affect scale

13.6 **Hypothesis testing**

Mean and standard deviations for cognitive bias measure, mood measures, self-esteem measure and manipulation checks, for each condition and each time point measured, are displayed in Table 13:4: Mean and Standard Deviations for Bias Measure, Mood measures, Self-esteem measure and manipulation checks per condition.

13.6.1 Effect of intervention conditions on Cognitive Bias

It was predicted that participants in the intervention conditions would have greater increases in cognitive bias, compared to the control (C) and that the heightened suggestion condition (HS) would be more effective than the suggestion only (SO) condition at cognitive bias modification (CBM).

Cognitive bias (CB) was measured by the Scrambled Sentence Test (SST). The greater the ratio of negative sentences to completed sentences corresponded to the greater degree of negative cognitive bias. A repeated measure (RM) ANOVA was performed with SST scores at time 1 and time 2 as the within subject factors, and group (suggestion only, vs, heightened suggestion vs control) as the between subject factor. Levene's test was not significant (see Appendix 6.3).

Results, displayed in the graph below, Figure 13:2: Group mean SST scores at time 1 and time 2, showed a main effect of time $F(1,156) = 26.25, p < .001, \eta_p^2 = .14$ indicating a significant difference in the scores between time 1 and time 2. There was no significant group/time interaction $F(1,156) = .08, p = .92, ns, \eta_p^2 = .001$ and no main effect of group, $F(1,156) = .09, p > .05, \eta_p^2 = .001$. This indicated that all groups had a decrease in negative CB but there was no significant difference between the groups.
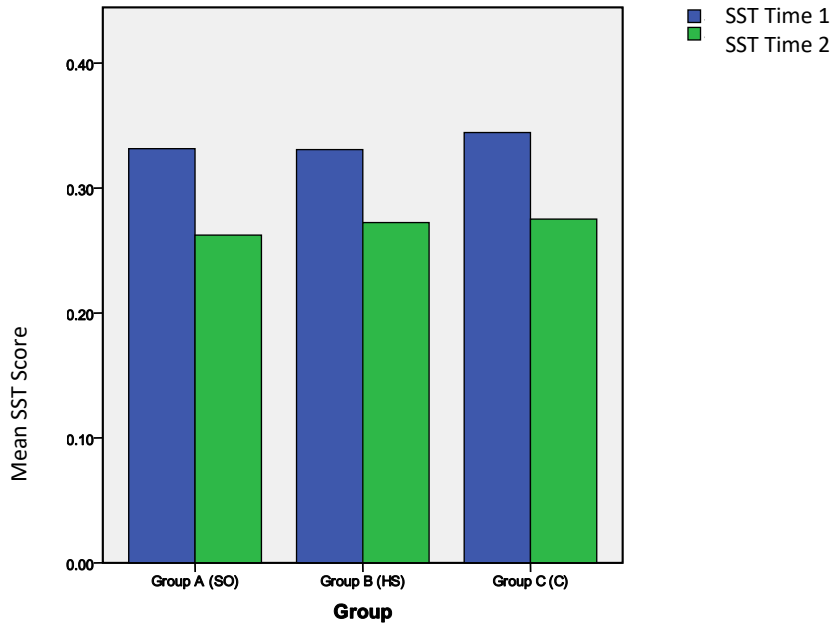
Figure 13:2 *Group mean SST scores at time 1 and time 2: the higher the value on the y axis the greater the number of negative resolutions*

13.6.1.1 Number recall

86% of the participants remembered the 6 digit correctly in the first SST and 66% in the second SST.

13.6.2 Effect of Experimental Conditions on Positive Affect

It was hypothesised that the intervention conditions would have a greater effect on positive affect (PA) than the control. This was tested by using a RM_ANOVA, with PA at time 1 and time 2 as the within group factor and group the between factor. Levene's test was non-significant (see Appendix 6.3).

There was a significant effect of time on PA, $F(1,156) = 13.14$, $p<.001$, and the effect size[3], (partial eta square (η_p^2) = .08) was small. There was no main effect of group,

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[3] Effect size is expressed as partial eta square, η_p^2 which is interpreted as small (0.02), medium (0.13), and large effect sizes (0.26 or higher)

$F(2,156) = .904, p=.41, ns, \eta_p^2 = .01$ but as predicted, there was a significant interaction between group and time, $F(2,156) = 9.83, p<.001$, with a small/medium effect size, $\eta_p^2 = .11$.

This interaction was decomposed by comparison of change over time by condition by ANOVA. Planned contrasts revealed that there was a significant difference between suggestion only (SO) and control, $t(156) = 2.12, p<.05 \ \eta_p^2 = .03$ and between heightened suggestion (HS) and control, $t(156) - 2.15, p<.05, \eta_p^2 = .03$.

The graph below, Figure 13:3: Levels of positive affect pre (time 1) and post (time 2) in the experimental conditions for each group, illustrates the change in positive affect pre and post the experimental conditions (time 1- time 2).
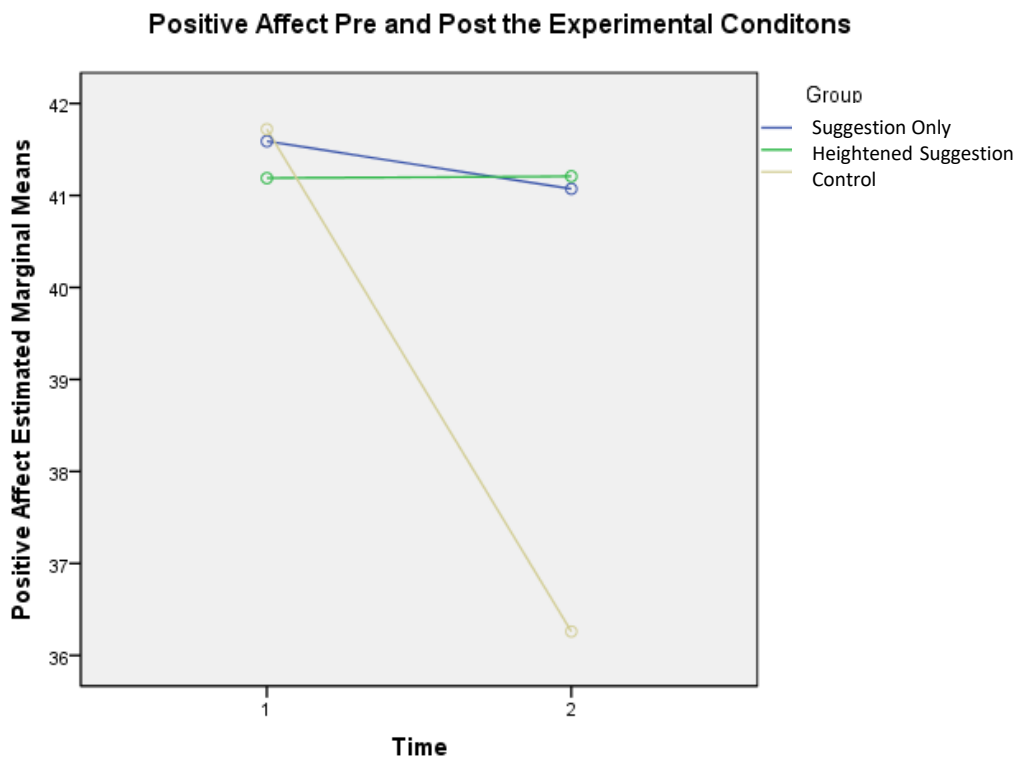
Figure 13:3 *Levels of positive affect pre (time 1) and post (time 2) in the experimental conditions for each group, showing the significant drop in positive affect in the control group. SO = suggestion only; HS = heightened suggestion; C = control.*

13.6.3 Effect of experimental conditions on Negative Affect

It was hypothesised that the different conditions would have differing effects on negative affect (NA), with NA increasing in the control, and decreasing in the suggestion only (SO) and heightened suggestion (HS) conditions.

Results of a RM-ANOVA with NA (windsorised) at time 1 and time 2 as the within group factor and group as between factor, revealed that all groups had a significant fall in NA pre and post condition, $F(1,156)=82.06$, $p<.001$, $\eta_p^2 = .35$ (a medium/large effect size). (Levene's test was non-significant, see Appendix 6.3). There was no main effect of group, $F(2,156) = .113$, $p = .894$, *ns*, and no significant interaction with group, $F(2,156) = 2.03$, $p = .134$, *ns*. The graph below, Figure 13:4: Negative Affect Scores in each condition at time 1 and time 2, illustrates the drop in negative affect in all groups, pre and post intervention conditions.
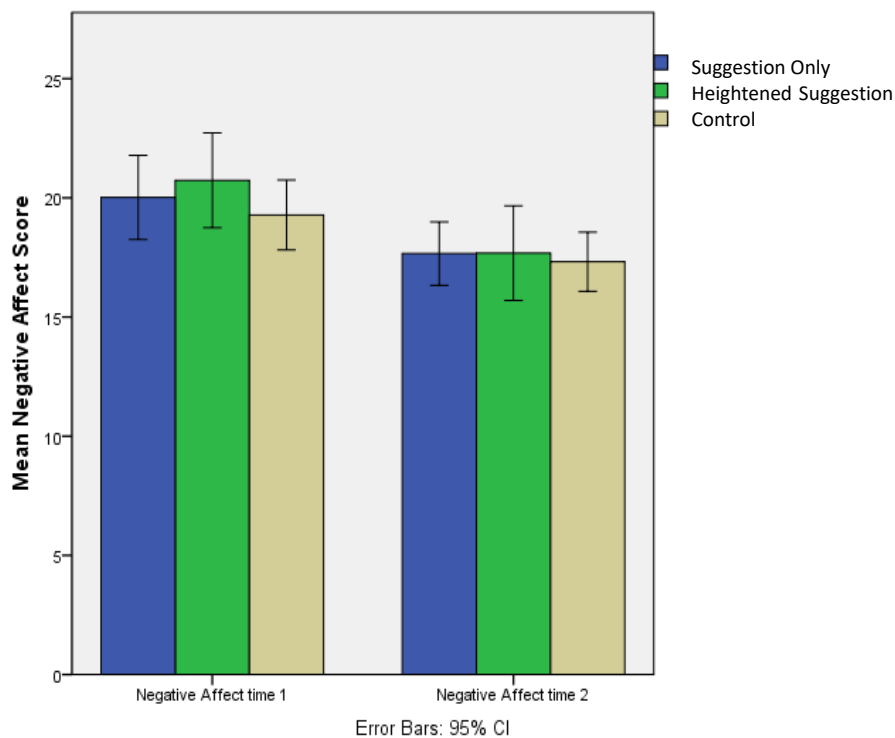
Figure 13:4 *Negative Affect Scores in each condition at time 1 and time 2, with 95% confidence intervals, showing similar significant drop in negative affect across all conditions.*

13.6.4 Effect of Experimental Conditions on Self-esteem

It was hypothesised that the rise in self-esteem would be significantly greater in the intervention conditions compared to the control and that the increase would be greatest in the Heightened Suggestion group. This was tested by using a similar ANOVA to those above, with Self-esteem at time 1 and time 2 as the within group factor and group the between factor. Levene's test was non-significant (see appendix).

There was a significant main effect of time F (1, 156) = 70.57, $p<.001$, $\eta_p^2 = .31$ indicating that the self-esteem increased post intervention. There was no main effect of group $F(1, 156) = 0.47$, $p=.621$, ns, but as predicted a significant interaction between group and self-esteem score, $F(2, 156) = 3.66$, $p<.05$, $\eta_p^2 = .05$, indicating that the groups had a differential effect on self-esteem.

This interaction was decomposed by comparison of change over time within condition, by ANOVA and is displayed in Figure 13:5: Self-esteem mean change scores from Time 1 and Time 2 (pre and post condition) in each of the 3 groups, below. As predicted, planned comparisons showed that the increase in self-esteem was significantly greater in the heightened suggestion condition compared to the control, t (156) = 2.70, $p < .01$, $\eta_p^2 =.05$. The differences between the heightened suggestion condition and the suggestion only condition and the suggestion only condition and the control were not significant.
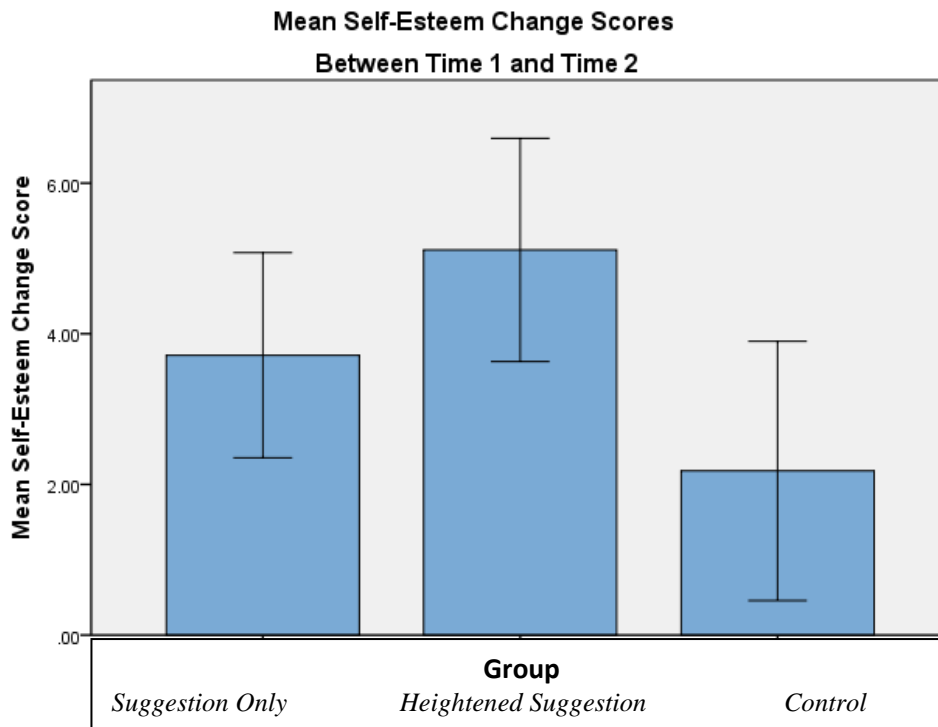
Figure 13:5 *Self-esteem mean change scores from Time 1 and Time 2 (pre and post condition) in each of the 3 groups Suggestion Only (SO), Heightened Suggestion (HS) and Control (C), with 95% confidence intervals, showing the significant difference between Heightened Suggestion and Control groups (p<.01)*

The effect of the conditions on self-esteem was further explored through analysis of the 2 self-esteem subscales - social and performance subscales.

13.6.5 Social self-esteem subscale

Results of a repeated measure ANOVA social self-esteem subscale showed a significant interaction between group and self-esteem score, F (2,156) = 3.44, $p < .05$, $\eta_p^2 = .04$. This interaction was explored by comparison of change over time within conditions. Planned contrasts revealed that the heightened suggestion group had a significantly greater increase in social self-esteem compared with both the control (t (156) = 2.03, $p < .05$, $\eta_p^2 = .03$) and the suggestion only groups (t (156) = 2.45, $p < .05$, $\eta_p^2 = .03$), as shown in Figure 13:6: Mean change scores of social self-esteem pre & post condition in the different groups, below.
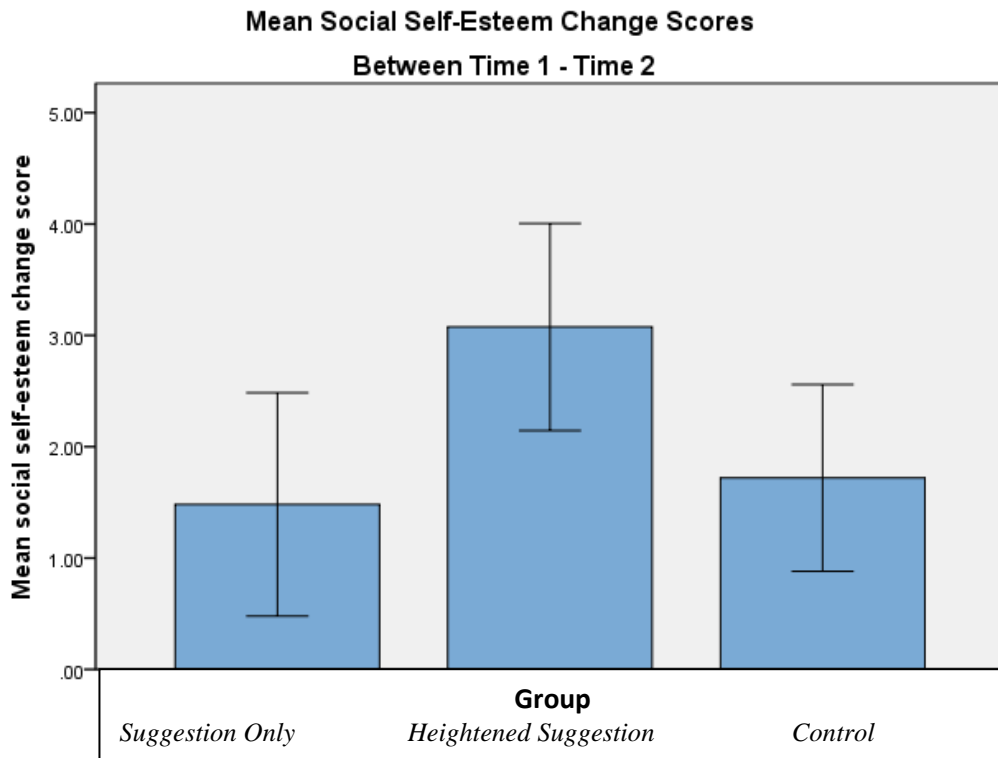
Figure 13:6 M*ean change scores of social self-esteem pre & post condition in the different groups, showing the significant difference between Heightened Suggestion and Control and Suggestion Only groups (ps<.05). Error bars show 95% confidence intervals*

13.6.6 Performance self-esteem subscale

Similar to the total self-esteem score and social self-esteem subscale, results showed a significant interaction between group and self-esteem score, $F(2, 156) = 4.06$, $p < .05$, $\eta_p^2 = .05$, indicating the conditions had a differing effect on self-esteem. The Figure 13:7: Mean change scores of performance self-esteem pre & post condition in the different groups, below, shows the mean change scores for self-esteem performance subscale pre and post condition. Planned comparisons revealed that the control group had a significantly smaller rise in self-esteem performance than the suggestion only condition (SO), $t(156) = 2.63$, $p<.01$, $\eta_p^2 = .04$, and the heightened suggestion (HS), $t(156) = 2.31$, $p<.05$, $\eta_p^2 = .03$. There was no significant difference between groups SO and HS.
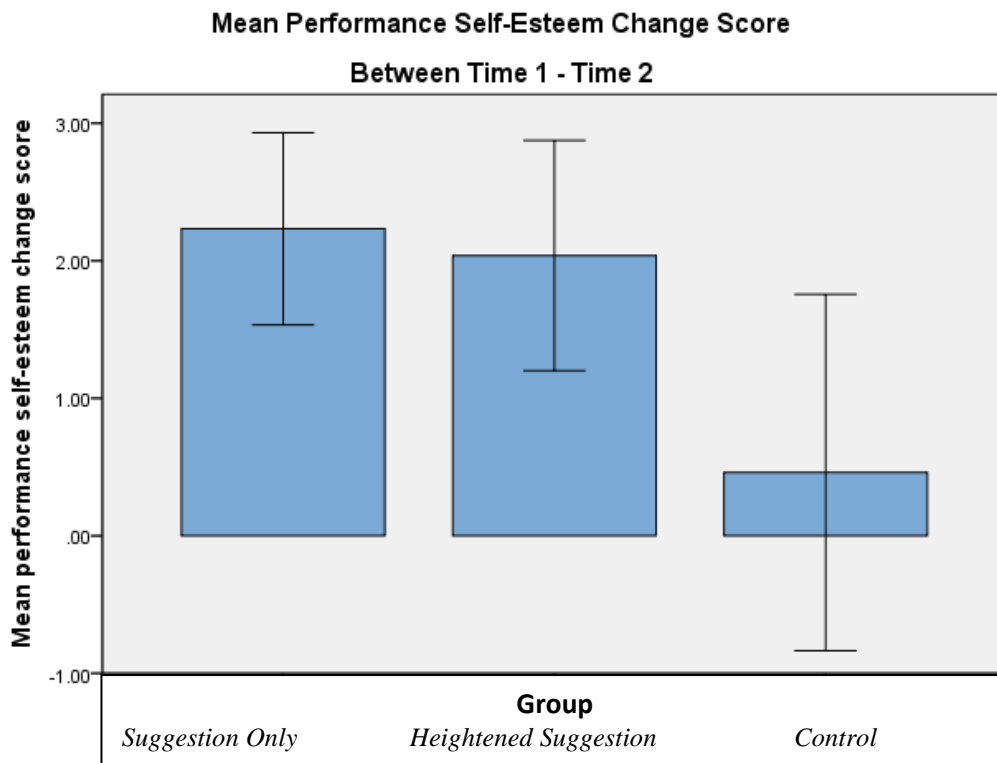
Figure 13:7 M*ean change scores of performance self-esteem pre & post condition in the different groups, showing the significant difference between the Control group and Suggestion Only, and Heightened Suggestion groups (p<.01, p<.05, respectively). Error bars show 95% confidence intervals*

13.6.7 Emotional vulnerability and experimental condition

It was hypothesized that those with emotional vulnerability (as measured by high social anxiety score, high depressive index score or low resilience score) would have a greater response (measured by CB, positive affect, self-esteem) to the Heightened Suggestion condition compared to those in the Suggestion Only condition or in the Control group. To test this, subgroup analysis of these variable scores were used as comparison groups within RM-AVOVAs. Descriptive statistics are shown in the Table 13.5: Variable score statistics for subgroup determination, below, and high and low subgroups of these variables were determined by using the 25th and 75th percentiles along the lines of previous analogue studies (e.g. Stopa & Clark, 2001), and added separately as a fixed factor to individual RM_ANOVAs of the cognitive bias measure, positive affect and self-esteem.

Table 13:5 *Variable score statistics for subgroup determination*

		Social Anxiety (SPIN)	Depressive (BDI-s)	Resilience (CDRISC)
Mean score		21	1.41	27.26
Percentiles	25	11	0.00	23.00
	50	19	1.00	28.00
	75	30	2.00	31.00

Subgroup numbers, mean and standard deviation are shown in Table 13:6: Participant number, mean and standard deviation in high and low percentiles of Social Anxiety, Depression & Resilience scales in the 3 group conditions, below.

Table 13:6 Participant number, mean and standard deviation (sd) in high and low percentiles of Social Anxiety, Depression & Resilience scales in the 3 group conditions

Group	score	Social Anxiety			Depression			Resilience		
		Mean	sd	n	Mean	sd	n	Mean	sd	n
Group A Suggestion Only	low	0.27	0.14	13	0.25	0.18	23	0.45	0.21	16
	high	0.45	0.21	10	0.47	0.18	20	0.22	0.15	16
Group B Heightened Suggestion	low	0.22	0.11	13	0.30	0.16	20	0.42	0.23	11
	high	0.45	0.17	15	0.37	0.22	17	0.29	0.17	16
Group C Control	low	0.31	0.17	17	0.32	0.16	16	0.45	0.16	16
	high	0.42	0.16	15	0.40	0.18	20	0.28	0.18	13

Results (as detailed in Appendix 6.4) showed no significant interaction effects of the high low percentiles of the social anxiety, depressive or resilience scores with cognitive bias, positive affect or self-esteem variables over time (pre and post interventions) indicating that whether a participant had high or low depressive, social anxiety or resilience scores did not significantly affect their response to the intervention conditions or control (as measured by cognitive bias modification, positive affect or self-esteem ratings).

There was an indication that level of resilience may influence self-esteem performance subscale levels and positive affect levels post conditions, as these interactions were approaching significance, $F(1,82) = 3.68$, $p = .06$ and $F(1,82) = 3.53$, $p = .06$, respectively. Detailed in Appendix 6.4.

As can be seen from Table 13.6 Participant number, mean and standard deviation in high and low percentiles of Social Anxiety, Depression & Resilience scales in the 3 group conditions, the numbers of these percentile subgroups were small, lack of statistical power may have accounted for the lack of findings.

13.7 **Resilience Hypothesis**

It was hypothesised that the intervention conditions would be more successful at promoting resilience compared to control. Resilience has been previously tested (Philippe *et al.* 2009) by the ability to maintain positive affect (PA) when subjected to a stressor, such as induced low mood. Therefore this hypothesis was tested by inducing a dysphoria in the participants, by asking them to watch a sad film.

13.7.1 Low Mood Check between Time 3 – Time 4

The effectiveness of the short (3 min.) sad film, used as a stressor, was checked by comparing NA (windsorised) between time 3 and time 4 with a RM-ANOVA, with NA as a within subject factor and group as the between subject factor .

There was a main effect of time $F(1,156) = 107.718$, $p < .001$, $\eta_p^2 = .41$ and no group time interaction ($F(2,156) = .180$, $p = .835$, *ns*), indicating that the film was successful in significantly increasing negative affect in all groups, as shown in the Figure 13:8: Mean negative affect scores pre and post the mood manipulation in the 3 conditions, below.
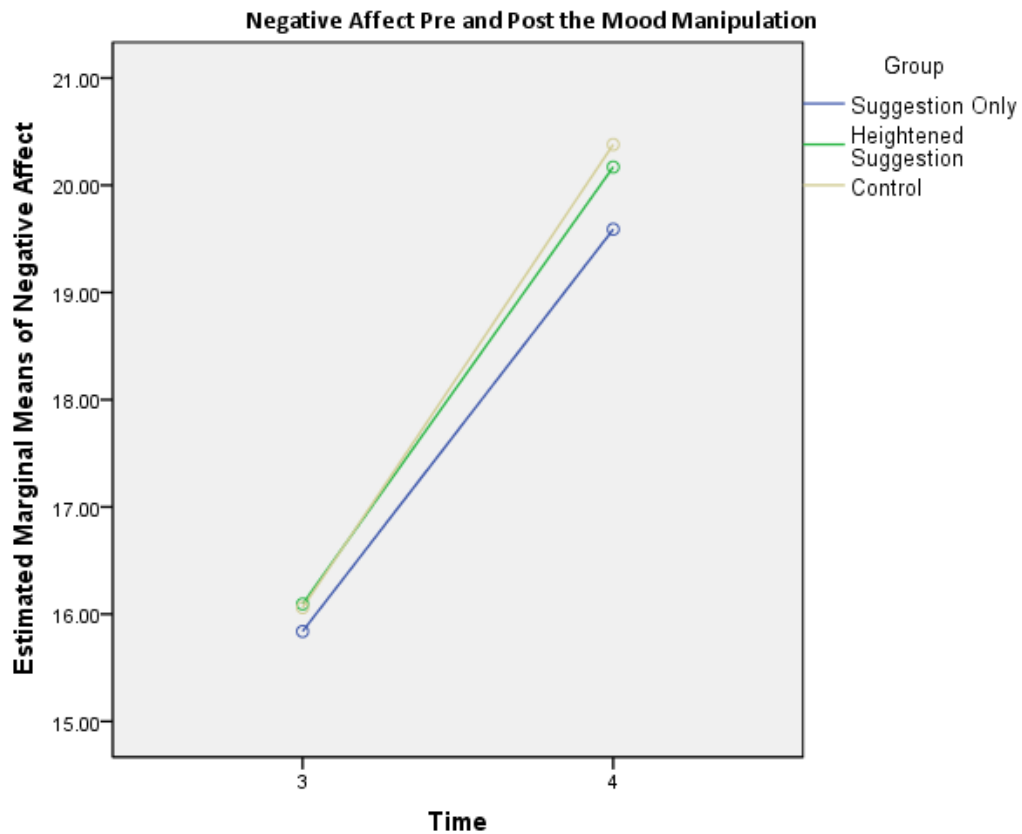
Figure 13:8 *Mean negative affect scores pre and post the mood manipulation in the 3 conditions, showing a similar rise in negative affect as a result of watching the sad film.*

13.7.2 Resilience Test between Time 3 and Time 4

Figure 13:9: Mean Positive Affect scores pre and post the mood manipulation in the 3 conditions, below, illustrates positive affect levels pre and post mood manipulation (time 3 and time 4) in each experimental conditions.

Results of a repeated measure ANOVA showed significant effect of time, $F(1,156) = 160.44$, $p<.001$; and no effect of group $F(2,156) = 1.82$, $p=.165$, *ns*; and no significant group time interaction, $F(2.156) = .747$, $p=.475$, *ns*. This indicates that all groups had a similar fall in positive affect and that there was no significant difference between the conditions in their ability to maintain levels of positive affect when subjected to a low mood manipulation.
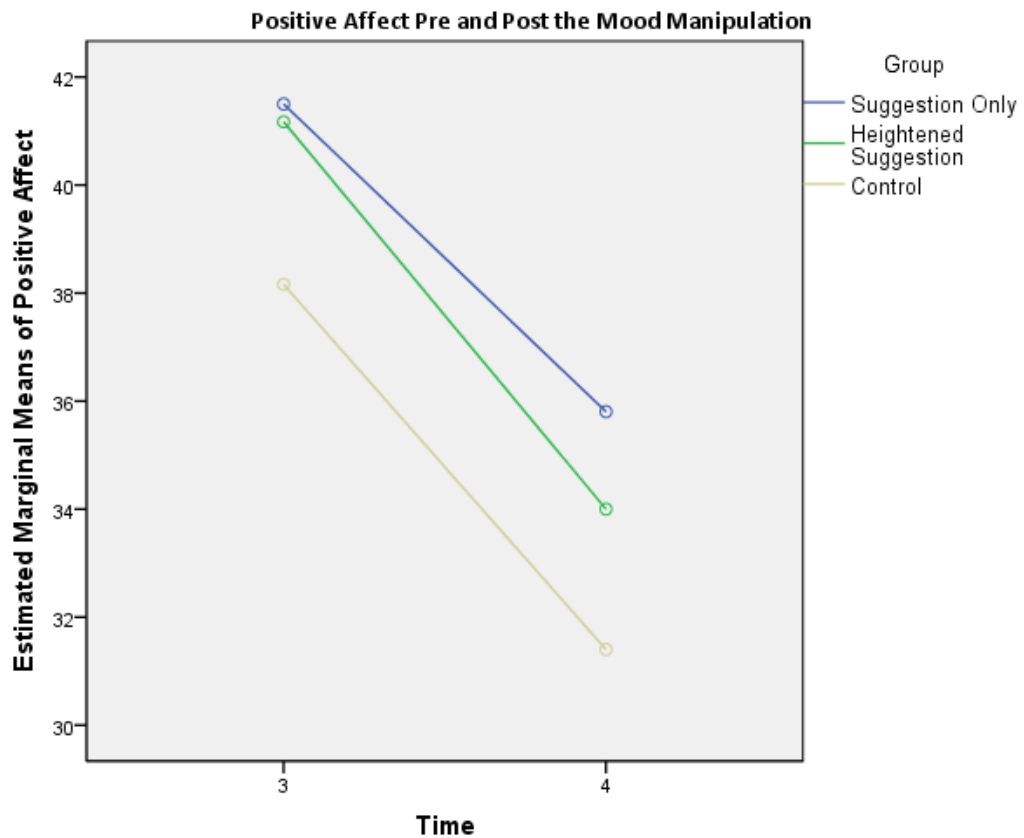
Figure 13:9 *Mean Positive Affect scores pre and post the mood manipulation in the 3 conditions showing a similar rise in negative affect as a result of watching the sad film*

13.8 **Manipulation checks**

13.8.1 Experimental condition manipulation checks

Participants were asked 4 questions to rate their experience of listening to assess 1) relaxation; 2) mind wandering (both related to relaxation), and 3) visualisation, 4) analytical thinking (both found to be influential in CMB [Holmes *et al.* 2009]).

ANOVA showed a significant effect of group for the visualisation question '*How much did you find yourself thinking in images*', F (2,156) = 15.72, *p*<.001, η_p^2 = .17, and planned comparisons revealed that control group (Group C) had a significantly higher score for '*thinking in images*'(visualisation) compared with the suggestion only group

(Group A), $t(156) = -5.34$, $p<.001$, $\eta_p^2 = .15$ and the heightened suggestion group (Group B), $t(156) = -4.25$, $p <.001$, $\eta_p^2 = .10$. This was perhaps a result of their script containing concrete images of the University of Edinburgh and of the landscape and weather.

There was no other significant difference between the groups within the other three manipulation check questions i.e. relaxation $F(2,156) = .382$, $p = .683$, ns; mind wandering $F(2,156) = .711$, $p = .493$, ns; analytical thinking $F(2,156) = .164$, $p = .197$, ns. Barcharts are displayed in Appendix 6.5. These results indicate that there was no difference between the conditions in their ability to induce relaxation, mind-wandering, nor analytical thinking.

13.8.2 Filler Task Between Time 2 – Time 3

A 2 minute filler task was given to allow any mood effect of the condition to normalise. To check this positive and negative affect were compared at time 3 by separate ANOVAs, with PA or NA as the dependent factor and group as the fixed factor. There was no significant difference between the groups for PA or NA, [$F(2,156) = 1.39$, $p= .253$, ns and $F(2,156) = .09$, $p =.913$, ns respectively], indicating that the filler task had successfully allowed sufficient time for the groups to 'normalise' after any effect of the experimental conditions.

14 Discussion of Study 3

This study sought to establish whether a positive suggestion, self-esteem component, of a health promotion audio intervention, would serve as a CBM intervention resulting in significantly higher levels of positive cognitive bias, self-esteem, positive affect, and resilience in a student population compared to a control. Additionally the study sought to establish if a relaxation induction combined with positive suggestion (heightened suggestion, HS) would increase this effect over that of positive suggestions alone (suggestion only, SO), particularly in those with emotional vulnerability.

Results were as predicted in that the intervention conditions resulted in significantly higher levels of self-esteem (SE) and positive affect (PA), when compared to the control. The intervention conditions also resulted in significant increases in positive cognitive bias. However the control condition, also, significantly increased positive cognitive bias (CB).

The differences found between the experimental conditions adds to the established literature on CBM. Pre and post experimental conditions, the intervention groups demonstrated a significant rise in positive CB and a maintenance of PA, whilst the control group showed a significant drop in PA *but also* a similar significant rise in positive CB. The fact that there was no difference between the groups in CB despite the difference in mood state supports the findings of Standage *et al.* (2010) who reported that a change in mood state was not significantly associated with a change of CB. This suggests then, that in this present study, there may be some other mechanism responsible for the CB improvement across all groups. There may be a practice effect of repeating the scrambled sentence test which enabled positive sentence resolution. This is however unlikely as the cognitive bias measure (SST) included a memory load which is thought to disable strategic process (Rude *et al.* 2003; Wenzlaff & Bates, 1998). Additionally other researchers have successful demonstrated CBM with studies involving repeating the SST. Bowler *et al* (2012) investigated CBM, with a no intervention control and computerised CBT and reported a significant group x time

interaction effect size of $\eta_p^2 = .09$, pre and post the interventions (4 sessions over 2 weeks) and SST under a cognitive load. Standage *et al.* (2010) reported an effect size of $\eta_p^2 = .33$ for group x time interaction in their study comparing negative and positive CBM (SST under cognitive load). In this current study although there was no significant effect of group (as all groups increased CB) there was a similar effect size $\eta_p^2 = .14$ pre and post experimental conditions.

This present study intended to compare positive CBM (interventions) with neutral CBM (control). It was not expected that the control condition would increase positive CB, as it had an absence of self-referential material. Given the finding that the control condition did however result in increased positive CB, it is important to consider the mechanisms which may have caused this outcome. The manipulation check revealed that those in the control group reported a significantly higher level of visualisation compared to the intervention groups. Unforeseen, the use of visualisation in the control group may have resulted from the very concrete descriptions of the weather and particularly the university buildings. Visualisation has been observed to be associated with positive CB (Lang *et al.* 2012, Holmes *et al.* 2009). However it is likely that the intervention groups were employing visualisation as well, as the interventions contained suggestions of visualisations. It may be then, that the CBM effect of the positive suggestion interventions, in combination with CBM effect of visualisation, may have added up to the same CB effect as the stronger reported visualisation in the control group. Future research could investigate this further by using a different control that may not increase CB or contain opportunities for visual processing, e.g. music.

The ability of experimental conditions and (unexpectedly) the control condition to increase positive cognitive bias, in this current study, may also explain why this study failed to demonstrate the ability of intervention conditions to protect against a low mood induction (through the maintenance of positive affect). If CB does underpin resilience (as suggested by some researchers, e.g. Telman *et al.* 2013), then, as there was no group difference in CB, a group difference in response to a mood manipulation would not be expected. Other researchers have noted conflicting results within the CBM field. Salemink *et al.* (2009) noted that unlike other CB tests used in their study

(reaction times), the Ambiguous Social Situations Interpretations Questionnaire, although changing over time, did not reveal any significant difference between a positive CBM and a neutral CBM group. Similar to this current study, Salemink *et al* (2009) also noted changes in emotionality (anxiety) and no discernible group difference with a stress test.

There was a demonstrated differential effect between the intervention conditions and the control in the affective measures, i.e. positive affect and self-esteem. This is consistent with the hypothesis that the positive suggestion interventions would result in improvements in positive affect, and self-esteem, compared to control. However this study is novel in that research has not, to this author's knowledge, compared suggestion plus relaxation (heightened suggestion) with suggestion without relaxation (suggestion only). The hypothesis that the heightened suggestion (HS) condition would be more effective than the suggestion only (SO) at improving these measures was only observed in the social self-esteem scale. Both the HS and SO conditions were equally effective in all other outcome measures. The similarity of effect on outcome measures of the two intervention conditions is interesting. The manipulation checks for visualisation, relaxation, mind wandering and analysis found no difference between the intervention groups. Therefore, as relaxation has been found to increase suggestibility (Gandhi & Oakley 2005), the similarity in relaxation noted in the manipulation checks may explain the similarity in outcomes in the intervention groups. Additionally the comparability in visualisation may also be a contributing factor, (similarly to the control condition), to their equivalent effect, as the beneficial effect of visual processing mode in CB has been noted (Holmes *et al.* 2009, Murphy *et al.* 2011; Standage *et al*. 2009 Lang *et al.* 2012). Furthermore the process of hypnosis engages visual areas of the brain in fMRI studies (Rainville et al 2002). Moreover, it is also of note that to match experimental conditions for length, it was necessary for the appraisals to be repeated in the suggestion only group. This may also have had a beneficial effect, further making the interventions similar.

The exception to this is the significant differential effect in the self-esteem social subscale, with the HS condition showing a greater increase in this scale. The social self-esteem subscale measures personal evaluation to social situations. The fact that the participants in the HS group had a greater increase in social self-esteem is consistent with this author's hypothesis that relaxation reduces the level of self-evaluation, through the minimisation of the upward counterfactual effect/error evaluation effect. It may be that those who listened to the HS condition then would have been less self-evaluative as the addition of relaxation with suggestion allowed greater assimilation of positive material. However the self-report relaxation level being the same in each group is inconsistent with this explanation and further research is needed to tease out the influence of relaxation on assimilation of positive suggestions.

Recent research has highlighted the importance of the counterfactual effect and affect assimilation in CBM research, postulating that this may be a contributing factor to some of the contradictory CBM research (Standage *et al.* 2013). Clearly understanding the underlying mechanisms of CBM is important in advancing the field. Standage et al (2013) noted that positive CBM was successful only in those participants who assimilated the valenced scenarios (i.e. perceived similarity between self and the scenario) and not in those who dissimulated (i.e. evaluators, contrasting themselves with the scenarios), suggesting that evaluative processing may enhance or diminish CBM interventions. Results from this current study suggest that the interventions used successfully operated as CBM procedures. These interventions adopted a novel approach of using positive suggestions, rather than the more often used interpretative bias training. The CBM audio conditions in this present study employed positive appraisals and reappraisals of the future. Representations of self were offered in the future, e.g. – *will help you increase your self-image',* and it may be that when listening to scenarios of self in the future there is less counterfactual evaluation occurring. Suggestions of a positive future could be said to give a sense of hope and hope has been identified as an important element of placebo response (Kirsch, 2009). Placing suggestions in the future is an integral part of ego strengthening techniques which have been shown to be effective in a number of studies, (e.g. Laverture *et al.* 2002; Dobbin *et al.*, 2004). Further research could investigate whether indeed employing the future

tense for positive suggestions is effective in CBM. Additionally, it would have been interesting to look at social anxiety post intervention, as it is predicted that social anxiety would decrease due to less social self-evaluation.

Contrary to expectations, no differential response to conditions was found between high or low emotional vulnerability participants. Other researchers have found that a differential response to condition occurs in emotionally vulnerable groups, e.g. Tugarde and Fredrickson (2004) observed that those with low trait resilience experienced greater physiological stress, compared to high resilients, in response to a threat task, whereas, when instructed to view the same task as a challenge, low resilients were no more physiologically stressed than the high resilients. Similarly Dobbin *et al.* (under review) observed that those with depressive vulnerability had a greater increase in PA and specific memories, after a positive appraisal condition, compared to those without such vulnerability. It may be that in this current study the subset numbers were too small. However within the CBM literature a recent meta-analysis concluded that the evidence suggested CBM significantly modifies anxiety but not depression (Hallion & Ruscio, 2011).

In summary then, this study identified that positive appraisal suggestions given with or without relaxation have the same ability to maintain levels of positive affect, and increase levels of self-esteem compared to a control. Furthermore this study demonstrated that positive appraisal suggestions were effective as a CBM intervention in increasing positive CB. This study also elicited a dissociation between affective and cognitive measures, in that an increase in positive CB was not associated with an increase in mood (PA and self-esteem). CB was found to predict the response to a stressor, rather than PA. This may indicate that CB is a factor in resilience and further research should explore this relationship.

This study has a number of limitations, beyond that of the control group discussed above. It was carried out with students and therefore generalisations beyond this population should be made cautiously. The CBM modification was delivered in one session with assessments immediately post the experimental conditions. Further

research is required to assess whether the effects noted here would be maintained. All measures are self-report measures which are by their nature subjective, future research could use objective physiological measures such as finger pulse amplitude as a resilience test. Furthermore the manipulation checks have not been subject to psychometric analysis.

This study has demonstrated that positive appraisals are effective in CBM. Traditionally CBM involves ambiguity training, which is time consuming and complicated. It may be that listening to audio appraisals is an easier and more amenable route to CBM. Unlike other CBM interventions which originated in the laboratory and are now being extended to the community, the CBM in this study is part of a programme that is used in the community. This study was the first, as far as this author is aware, to compare possible benefits of positive suggestions delivered with or without relaxation and their effect on affect, self-esteem and cognitive bias.

15 Conclusion

This chapter will firstly present a summary of the hypotheses and results of each of the three studies in this thesis, before presenting a synthesis of the findings and a critical overall discussion.

15.1 Study 1 summary

It was hypothesised that**:**

1. Positive Mental Training would improve wellbeing, resilience and mindfulness, relative to controls; and Positive Mental Training would improve mental health and reduce burnout, relative to controls.

Results demonstrated that the intervention (PMT) significantly increased wellbeing and significantly decreased depression compared with the control. Listening to music (i.e. the control) and the intervention both showed similarly significant improvements in mindfulness, stress, anxiety, mental distress (DASS total) and exhaustion.

2. A higher degree of engagement with Positive Mental Training would be correlated with a greater increase in mental wellbeing and mental health.

Listening to the intervention was significantly associated with improvements in mental health indictors. There was a strong association between amount listened to PMT and improvements in personal efficacy and medium associations between amounts listened to PMT and improvements in wellbeing, mindfulness, emotional distress (total depression anxiety and stress score) and exhaustion. There was no statistical difference in the amount of listening between the control and intervention group Analysis of gender showed that men engaged more with the programme. Women listened less. However this differential gender pattern of listening was unaffected by group allocation

3. Any effect of Positive Mental Training on increasing wellbeing, resilience, mindfulness and mental health would increase over the timespan of the intervention and be maintained after the intervention had finished (i.e. at follow-up)

Results showed that the effect of the intervention on wellbeing and depression was due to a difference at 12 weeks only, which was not sustained at follow up (26 weeks). Mindfulness showed a small effect size difference at 12 weeks and a medium effect size difference at 26 weeks between the intervention and control. Exhaustion was significantly lower in the control group than the intervention group at 26 weeks.

15.2 **Study 2 summary**

The following qualitative questions were asked:

1   What motivated participants to listen to the programme?

Analysis of interview data revealed motivation to listen to the programme consisted of two themes: 'Initial Engagement' and 'Continuing Engagement. 'Initial Engagement' was influenced by looking for help with stress, being open to the opportunity to try the programme, finding the structure of the programme appealing and also having an understanding of how the programme worked, so that it made sense within existing beliefs and experiences. Motivation for continued engagement was influenced by finding rewards, making a routine for listening, being committed and having open expectations.

2   What were the perceived benefits of the programme?

Many benefits were reported by the participants, and these were categorised into four themes – 'Increased Relaxation', 'Letting Go Of Worries', 'Increased Confidence' and 'Increased Coping Skills'. When these benefits were experienced, participants reported positive effects on their work and home life.

3   What were the perceived limitations of the programme?

Limitations of the programme were identified as being lack of guidance, finding time to listen and having an external view of stress. There also emerged from the data a difference in the ease of engagement between men and women. Women reported having competing demands on their time which impacted on their ability to find the time to listen.

The qualitative analysis revealed that for those participants that were interviewed, there was a clear difference in experience of those participants in the VRT group compared with the MRT group. The absence of the spoken word in the MRT directly impacted on skills learnt, as, unlike in the VRT group, there was no instruction on developing relaxation skills, using coping techniques and visualised rehearsals. Perhaps not surprisingly then, those in the MRT group reported fewer benefits which were more slowly gained compared with those in the VRT group. This impacted on motivation, and therefore motivational factors other than reward had to be employed, such as commitment. .

15.3 **Study 3 summary**

It was hypothesised that:

> *1. The intervention conditions would give rise to significantly greater levels of self-esteem, positive affect and cognitive bias, and concurrent lower levels of negative affect, compared to a control.*

Results were as predicted in that the intervention conditions resulted in significantly higher levels of self-esteem (SE) and positive affect (PA) when compared to the control. Negative cognitive bias (CB) was also found to be significantly decreased following the positive suggestion interventions, however the same decrease was observed in the control condition.

> *2. The intervention conditions would increase resilience, as measured by the maintenance of positive affect after a stress test, compared to the control.*

This study failed to demonstrate the ability of intervention conditions to protect against a low mood induction (through the maintenance of positive affect), due to the lack of a reliable control condition.

> *3. Self-esteem suggestions given with relaxation (heightened suggestion) would be more effective, as demonstrated by higher levels of self-esteem, positive affect and cognitive bias, compared to self-esteem suggestions alone and control.*

This study identified that positive appraisal suggestions given with (HS) or without relaxation (SO) had the same ability to maintain levels of positive affect, and increase levels of self-esteem compared to the control. The exception to this was the social self-esteem scale, where the heightened suggestion condition (HS) gave rise to greater increases compared to the suggestion only condition (SO) and control.

> *4. Those with emotional vulnerability (as defined by high scores in social anxiety and depression measures and low resilience measure) would exhibit a greater response to the heightened suggestion condition compared to the suggestion only condition.*

Contrary to expectations, no differential response to conditions was found between high or low emotional vulnerability participants

Furthermore this study also elicited a dissociation between affective and cognitive measures, in that an increase in positive CB was not associated with an increase in mood (PA and self-esteem). CB was found to predict the response to a stressor, rather than PA. This may indicate that CB is a factor in resilience

15.4 **General Discussion**

These three studies were concerned with investigating the effects of a health promotion intervention, Positive Mental Training (PMT), on promoting mental wellbeing and resilience in healthy volunteers. The three studies each took a different methodological approach to this investigation. Study 1 employed an RCT longitudinal design in the workplace, to compare the effect of the intervention against a control group over a period of time. Study 2 adopted a qualitative method to interview eleven participants from study 1 about their experience of using the programme; their motivations, benefits and limitations. Study 3 adopted an analogue design to investigate the effect of a single component, suggestion, of the intervention in a laboratory setting, using healthy volunteer students. This study compared the effect of positive suggestion delivered in two different ways (with or without relaxation) on cognitive bias modification, self-esteem, positive affect and resilience.

The studies elicited a number of findings. Firstly Study 1 demonstrated that the intervention was more effective at improving mental health than a control intervention, increasing wellbeing and decreasing depression. The fact this study employed an active control (listening to music) increases the robustness of this finding. Interestingly other outcome variables, i.e. mindfulness (although approaching being significantly higher at 26 weeks), stress, anxiety, and exhaustion, showed a similar improvement in both the intervention and control groups, indicating that, in these variables, listening to music (the control) was as effective as listening to the intervention. Other researchers have similarly reported equivalence of effect in other health intervention studies where two active interventions have been compared (Jain *et al.* 2007, Wolever *et al.* 2012). This highlights the importance of having an active control and moving away from the more common approach of using a wait list control, or a no 'treatment' control. Adopting such rigorous methodology to workplace studies, as in this current author's study, allows deeper exploration of mechanisms of change rather than a simple head to head approach. Likewise using a mixed methodology also extends simple comparative analysis. Study 2, through adopting such an exploratory approach was able to provide insight into the possible mechanisms of change behind the results

of study 1. Interview data described how motivations for listening, enabled making the time to listen which brought benefits - from restructuring the day, relaxation from making time to listen, and/or from learnt relaxation techniques. Although not quantitative, the interview data also revealed a marked difference in experience for those in the intervention group compared with the control group, in relaxation and particularly in benefits acquired, such as confidence, coping, letting go of worries and improved sleep. This supported the proposed mechanism of change, subsequently explored in study 3, that the suggestions given in the PMT programme (self-esteem and reappraisal) would be effective at increasing positive outcomes. These additional benefits may be underpinning the significant improvements in the intervention group in wellbeing and depression observed in study 1.

The fact that significant group differences were not similarly observed in anxiety, as they were in the depression measure, may point to differential mechanisms of the intervention, in that the intervention may contain aspects more able to help recovery from depression and depressive thinking, rather than anxiety. Although ruminative thoughts have been found to mediate the reduction in distress observed with mindfulness (Jain *et al.* 2007), recent evidence shows that rumination and reappraisal mediate the relationship between mindfulness and depression whereas rumination and worry mediate the relationship between mindfulness and anxiety (Desrosiers *et al.* 2013). PMT involves many suggestions to reappraise and recent research with a PMT reappraisal component found that positive affect and specific memories significantly increased in depressive students (Dobbin *et al.* under review).

Although both groups increased in mindfulness overall, analysis showed that the PMT group was approaching being significantly higher than the control group at 26 weeks (p=0.08), with a medium effect size, (partial eta squared =0.10). Additionally the significant improvements in mindfulness within the PMT group at 12 weeks were maintained at 26 weeks. Acquisition of mindfulness from listening to PMT is further supported by the qualitative finding of being able to let go of worries [reflecting mindfulness (Wells & Matthews, 1994)]. These findings support a speculated

mechanism of change in PMT, that the attentional focus of the relaxation training develops mindfulness.

As noted previously mindfulness interventions have been found to increase wellbeing and coping and consistent with this, interviewees described an increased sense of confidence and coping, both characteristic of subjective wellbeing (Lyubomirsky et al 2005). Given this then, it was surprising then that quantitative analysis of the wellbeing data showed that improvements in wellbeing in the PMT group, present at 12 weeks, were not maintained at 26 weeks. This may be explained by the quantitative study lacking sufficient power to reveal smaller differences at 26 weeks. This may also be due to the intervention having to be returned at 12 weeks. Analysis of study 1 data revealed that listening to PMT was significantly correlated with increases in wellbeing and this result corresponds to the significant increases in wellbeing observed at 12 weeks. This is further supported by results of study 3 which showed that listening to a component of PMT increased self-esteem and positive affect. It may then be that as study 1 participants had to return the intervention at 12 weeks, they no longer were able to listen to PMT and therefore found it harder to maintain or boost their positive affect, self-esteem and self-confidence, and therefore wellbeing. The qualitative interviews were held between 12 and 16 weeks and so may reflect an overall view of the benefits gained, rather than time specific narrative.

It would be interesting in future research to allow participants to retain PMT beyond the 12 weeks to ascertain if this would enable maintenance of wellbeing. In this way participants could 'dip in' to listening whenever they wished, for example after a stressful day or to prepare for a stressful event, to boost their positive affect. Additionally future qualitative research could incorporate a longitudinal enquiry to elucidate the temporal sequence and predeterminants of change.

Other research has similarly found that improvements in mental health indices have not been maintained beyond the programme (Grime 2004, Marine *et al*. 2006). This indicates the importance of acquiring skills to be carried beyond the life of an intervention, such as with mindfulness practice, and also of accessing ongoing

resources for wellbeing, whether through positive psychology recordings, such as PMT or activities which promote autonomy, competency and relatedness, such as exercise or social engagement. Indeed study 1 correlation analysis showed that time spent listening to the intervention was significantly correlated with improvement in indices of good mental health (wellbeing, mindfulness, total depression anxiety and stress score (DASS), personal efficacy and exhaustion), No such correlations were seen with the control group, although there was no statistical difference in the amount of listening recorded between these two groups.

An interesting observation from both study 1 and study 2 was the influence of gender on listening. Study 1 observed that although more women joined the study, women listened less. Study 2 revealed that this was due to the social pressures of women competing for their time, therefore making it harder for them to find the time to listen. This indicates that for this type of intervention it would be helpful to have measures to facilitate women's engagement, such as ring-fenced time at work, and/or additional support.

PMT is an intervention that contains both relaxation and suggestion and this study was the first, to this author's knowledge, to investigate the interaction of positive suggestion with relaxation. Interview analysis from study 2 revealed that acquired skills, such as confidence and coping were related to relaxation. In contrast, results from study 3, which compared positive suggestion with and without a relaxation induction, found that there was no, or minimal, difference between these two methods of delivery on raising self-esteem, positive affect and cognitive bias. It had been thought in study 3 that this would have been a critical difference, due to the effect of 'mindful' relaxation (employing attentional manipulation) on removing negative self-evaluative comparisons (counterfactual effect). However study 3 revealed the presence of these suggestions was influential with or without the relaxation induction, compared to the control condition, across a range of measures. The exception to this was that positive suggestion with relaxation, (heightened suggestions), were found to be more effective than suggestion alone at increasing social self-esteem. Social self-esteem measures the extent that someone feels self-conscious and thus has a strong element

of comparative self-evaluation (Heatherton & Polivy, 1991, Gruenewald *et al*. 2004). These results suggest that this aspect of self-esteem may be particularly vulnerable to the negative comparative effect of counterfactual thinking, which can be disabled by attentional manipulation, thus supporting the hypothesis that suggestions given with mindful relaxation as practiced by PMT, are more effective at countering self-evaluation than suggestion alone.

The similarity of outcome of the two conditions (suggestion with and without relaxation) may be explained by attentional manipulation being similarly present in both these conditions, through perhaps generation of visual positive self-images given in the suggestions. This is consistent with other researchers who found visualisation to be effective in reducing negative self-evaluation (Holmes, Lang & Shah, 2009), and that a state of instructed visualisation was similar to a mindful (attentional) state (Werner-Seidler & Moulds, 2012). This is also consistent with the results of the control group, which, although demonstrating significantly higher levels of visualisation than the conditions, showed significantly lower levels of self-esteem and positive affect (as there were no positive suggestions to adopt).

Thus the results from study 2 and study 3, suggest that relaxation and positive suggestion both have a beneficial effect in their own right. However the effect of positive suggestion is not dependent upon the relaxation, *per se*. but it is seems probable that attentional focus plays a part in adoption of positive suggestion.

Considering the results of all three studies, suggest that the control condition in study 1 acted as a relaxation intervention (evidenced study 2) Therefore there was a generic effect of relaxation experienced by both groups, explaining some equivalence of results, but however, there was also specific effects attributable to PMT over and above this. Results suggest that listening to PMT enabled the development of mindful relaxation skills, increased self-esteem, confidence and coping. Additionally results suggest that PMT may be more effective at promoting recovery from depressive thinking than anxiety.

Study 3 indicated that suggestion was a causal agent in the development of these outcomes. The hypothesis that attentional manipulation was a necessary adjunct to adopt suggestions may hold true as both conditions in study 3 reported similar levels of visualisation (resulting in similar levels of attentional manipulation), thus resulting in similar outcomes in self-esteem and positive affect, compared with the control (even through the control exhibited greater levels of visualisation). These results further suggest that positive cognitive bias which was observed to similarly increase in all three groups, is independent to changes in self-esteem and positive affect, and indicate that visualisation is the change mechanism of CB. This finding is consistent with other research showing a positive relationship between visualisation with CB (Holmes *et al.* 2009) and an inverse relationship between mindfulness and negative bias cognitions (Kiken & Shook, 2012). In sum, the combination of the results of the three studies suggest that the positive benefits of the PMT intervention, shown by statistical analysis in study 1 and reported by participants in study 2, may have come about from cognitive bias modification, through visualisation, and increases in self-esteem and positive affect, through suggestion. These processes would thus appear to be independent of each other. Additionally results point to increases in resilience, as evidenced the significant correlations with change scores in study 1 and the reports of increased coping skills in study 2. Whether or not cognitive bias underpins resilience was not clarified in study 3, however changes in positive affect in response to a stressor where in line with changes in cognitive bias, but lacked a control for comparison. Further studies could explore this.

However there are, of course, notable differences between the studies. Study 1/2 and 3 used different study populations with different exposure to the intervention. Study 1 & 2 participants had the opportunity for extended listening and therefore relaxation practice with the intervention, whereas those in study 3 listened to the intervention for 15 minutes only. Additionally study 3 conditions, in order to isolate the effect of the words, did not include the background music of the original intervention. A future study would investigate if the inclusion of the background music made any difference to the present results. Background music may have an effect on attentional focus which may further enhance positive assimilation of suggestions.

The limitations of each study have been discussed within their sections and additionally the triangulation of the studies has to be considered within the methodological limitations of the studies. However, each study contributes to a wider picture of the impact of a health intervention programme. These three studies give insight into the mode of delivery, change mechanisms, process and outcomes of a health promotion intervention. They support the view that the workplace is an effective place for such interventions, that there is a need for stress management wellbeing interventions in the workplace and highlight the requirements and limitations of this setting and of conducting research in the workplace. It may be that applying the rigorous empirical conditions of a double blind RCT as in study 1, whilst increasing the robustness of the results, is inappropriate for evaluation of a health promotion intervention. The blinding effect resulted in the participants having little knowledge or understanding of the active intervention and no guidance or expectations of effects. Applying the RCT conditions may have resulted in absence of the elements which have been identified as necessary for a successful health promotion workplace programmes. These are 1) health education (including a cognitive model), 2) links to related employee service, 3) supportive physical and social environments for health improvement 4) integration of health promotion into the organisation's culture and 5) employee screenings with adequate treatment and follow up (Lorig & Holman, 2003). Additionally Lovato & Green, (1990) found that goal setting (realistic, short term, flexible) was an effective way to maintain employee participation and this too should be part of a workplace intervention.

Future studies into workplace health promotion then should consider a more naturalistic approach to evaluation and to have a no intervention control as well as a matched control. Recommendations, from this current study, to lessen attrition rate in workplace studies would be to include guidance and support at the start and during the intervention, particularly for women. This could take the form of providing a conceptual model of the intervention, having a point of contact within the workplace and providing ring-fenced time to facilitate engagement in women. Consideration should also be given to extending the period of accessibility to the intervention so that it could be revisited in a refresher session/s. Research in this area should also embrace

mixed methodology to capture the process, rather than simple outcomes. Similarly having a matched control would help to elucidate the active mechanisms of interventions. This author's current study suggested that the intervention may be particularly effective for depressive thinking, and this could be further investigated by measuring the reappraisal effect within PMT and looking at mediation effects with depression, building on and extending the work of Desrosiers *et al.* (2013) and other studies with PMT (Dobbin *et al.* under review). Additionally the relationship of suggestion, attentional manipulation and cognitive bias in study 3 could be further clarified by ensuring that any control did not contain visualisation. This would help to answer whether or not suggestion and attentional manipulation act through different routes or through the same mechanism. Recent research in the field of pain has suggested these employ different neural pathways (Buhle *et al.* 2012), and clearly if this is the case for emotional distress (for which there is good reason to assume it is) then a combination of these processes would be advantages and have important implications for the design of health promotion interventions. Exploration of the relationship between attentional focus and self-evaluation continues to be an important factor for research in understanding how to increase self-esteem and positive affect, core attributes which underpin emotional resilience and wellbeing.

In summary then, results suggest that a self-help audio mental health intervention, Positive Mental Training, is an effective resilience and mental health wellbeing intervention for volunteer employees, that causes cognitive change through increasing self-esteem and positive affect, possibly through cognitive bias modification, and indicate that this programme could enable employees to have the skills to combat stress more effectively.

16 References

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Appendix

1 Appendix for Study 1 Methods

1.1 Letter of ethical approval from Lothian NHS

Lothian NHS Board

Lothian Research Ethics Committee 02
Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Telephone 0131 536 9000
Fax 0131 536
www.nhslothian.scot.nhs.uk

NHS Lothian

Ms Sheila Ross
PhD student
self employed
24 Boswall Road
Edinburgh
EH5 3RN

Date   16 February 2009
Our Ref
Enquiries to Lyndsay Baird
Extension   89061
Direct Line   0131 536 9061
Email lyndsay.baird@nhslothian.scot.nhs.uk

Dear Ms Ross

Full title of study: An evaluation of the impact of a positive mental training programme on the mental health and wellbeing of a working population.

REC reference number: 08/S1102/64

Thank you for your letter of 08 January 2009, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered at the meeting of the Committee held on 11 February 2009. A list of the members who were present at the meeting is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission at NHS sites ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Headquarters
Deaconess House 148 Pleasance Edinburgh EH8 9RS
Chair Charles J Winstanley
Chief Executive James Barbour O.B.E.
Lothian NHS Board is the common name of Lothian Health Board

INVESTOR IN PEOPLE

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Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter for mailing CD3 Week 8	2	14 November 2008
Response to Request for Further Information		08 January 2009
Participant Consent Form	2	08 January 2009
Participant Consent Form: For interviews	2	08 January 2009
Participant Information Sheet: Information Letter	2	14 November 2008
Participant Information Sheet: for Research Participants for Interview	2	14 November 2008
Protocol	2	11 November 2008
Application	2.0	14 November 2008
Covering Letter for Postal questionnaires week 4, 12 & 16	2	11 November 2008
P Morris & D Gillanders CVs	1	14 November 2008
Letter of invitation to participant	1	14 November 2008
Advertisement	1 (4 Posters & 1 Flyer)	14 November 2008
Questionnaire: Resilience Scale	1	14 November 2008
Questionnaire: Wellbeing Scale	1	14 November 2008
Questionnaire: Freiburg Mindfulness Scale	1	14 November 2008
Questionnaire: Depression, Anxiety and Stress Scale	1	14 November 2008
Questionnaire: Maslach Burnout Inventory	1	14 November 2008
Peer Review	1	04 August 2008
Letter from Sponsor		09 October 2008
Summary/Synopsis	1	14 November 2008
Covering Letter		13 November 2008
Investigator CV	1	14 November 2008
CD Script & DVDS	1	14 November 2008
DVD Script & DVDS	1	14 November 2008
Potocol to minimise Research Bias	1	14 November 2008
Letter Head	1	14 November 2008
Study Contact Details	1	14 November 2008
Questionnaire: Study Intake	1	14 November 2008
Covering Letter	1	11 November 2008

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review –guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

08/S1102/64	Please quote this number on all correspondence

With the Committee's best wishes for the success of this project

Yours sincerely

Professor Peter Hayes
Chair

Email: lyndsay.baird@nhslothian.scot.nhs.uk

Enclosures: List of names and professions of members who were present at the
                     meeting and those who submitted written comments
                     "After ethical review – guidance for researchers"

Copy to: Elspeth Currie

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Lothian Local Research Ethics Committee 02

Attendance at Committee meeting on 11 February 2009

Committee Members:

Name	Profession	Present	Notes
Miss Sharon Cameron	Expert (Nursing)	No	
Mrs O M A Chiswick	Expert (Nursing)	No	
Miss Laura Ellis	Expert - Research Nurse	No	
Professor Peter Hayes	Expert (Medicine) (Chair)	Yes	
Dr Calum MacKellar	Lay	Yes	
Mr Lindsay Murray	Expert (Research)	Yes	
Mr Andy Neustein	Lay	No	
Mr J Oliphant	Expert (Nursing)	No	
Dr Nigel Ostrowski	General Practitioner	Yes	
Mrs V Prosser	Lay	No	
Mr Thomas Russell	Expert - Consultant Neurosurgeon	No	
Ms Tzyvia Rye	Expert (Medical Research)	Yes	
Dr Lillian Schweizer		Yes	
Reverend Donald Stephen	Lay	Yes	
Mr W O D Walker	Lay	Yes	

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1.2   Minutes from Department of Clinical Psychology Ethics Meeting, Edinburgh University

DClinPsychol Ethics Meeting

4th August 2008

Present
Emily Newman
Suzanne O'Rourke
Jill Jones
Lindsey Murray
Eleanor Sutton
Paul Morris *
*Paul attended for Sheila Ross and Evelyn Janetta proposals to clarify any issues as supervisor.

Apologies
Ken Laidlaw
Mick Power

Sheila Ross
This is a PhD project supervised by Paul and David.
The panel had one main concern about the project, which was the commercial interest that the researcher has in the project and evaluation of the training. There was a discussion of whether this is appropriate for a PhD. However, the panel recommended that Sheila tries to be as transparent as possible and think about the following:
- She employs someone else to conduct the interviews.
  The extent to which someone else can analyse the interviews was debated, but the greater involvement of another in the analysis of the first interviews would be good. At the least someone else should compare codings.
- There was a discussion over how to phrase the part about use of results in training and promotion on the consent form. We were unsure whether this was group results or quotations from the qualitative study. It was suggested that a separate consent form exists for the qualitative study; otherwise she is in danger of losing participants who do not agree to this. For the quantitative study she could add to the statement on the consent form that presentations will include those for promotion of the product. The qualitative consent form should have a specific statement about the use of quotations.

  Other issues included:
- There may be a difference in commitment (engagement) between the intervention groups and she will need to be aware of this. This may be compounded by the information provided on the information sheets, which specifies the two conditions. The panel felt that she could make it less obvious which was the intervention and which the control in her descriptions. She should also relabel the CDs with 'A' and 'B' or '1' and '2'rather than print the name of the training. If participants are not made blind to conditions

she needs to make sure that she does not state this is blind in the method/ethics applications.

- It would also increase researcher blindness if someone else had control over data return, participant ID and condition.

- There was concern over the use of HADS in a non-clinical sample. The use of the DASS was recommended, to include a measure of physical symptoms.

- It was a bit unclear why occupational health need to be familiar with the scale used. It needs to be made clear that they cannot identify or contact any individuals from the study.

- What is the clinician version of the HADS? Did she mean the self-report version?

- The panel raised concerns that this would not be enough work for a PhD.

The project does not need to return to the panel provided that ethical issues are addressed.

1.3 Participant Information Letter

Information About the Research

We would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve from you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

About the study

The purpose of this study is to see if it is possible to improve the mental health and wellbeing of a working population with programmes of music relaxation training and verbal relaxation training.   It is thought, that, by listening to these audio training programmes it will be possible to alleviate stress, anxiety and depression and also protect against these by boosting general feelings of wellness. We would like to compare results from these two training groups to see which is most effective at promoting wellness. Which group you are in will be determined by chance, this helps us make both groups the same and is better for comparison. If we find that one type of training is better than the other, we will give this to you at the end of the research project. We will measure any effects with questionnaires about how you are feeling, which you will fill out yourself.

This research is being carried out as part of a PhD in the University of Edinburgh, School of Health in Social Science in conjunction with NHS National Services Scotland (NHS NSS)

Who is being invited to take part in this study?

Anybody can take part, all employees in your department are being invited. However places are limited to the first 200, so if you are interested please register/contact us as soon as possible.

 If you have bipolar disorder, a rare type of depression (or a family history of bipolar disorder) or you have schizophrenia, or a manic disorder, you cannot take part in the study. Please speak to the researchers if you want more information about this.

It is up to you to decide if you wish to take part. If you do we will ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time, without giving a reason. This will not affect your work record in any way.

What you are expected to do

If you decide to take part please phone or email the researcher on *(work number inserted here)*

You will be given an appointment to see the researcher which will last about 20 minutes where you will be asked to fill in some questionnaires on how you are feeling and then you will be either given the first CD of the music relaxation training or verbal relaxation training programmes to take home to listen to. If you do not have a personal CD player we will lend you one.

You will be asked to listen to a 20 min audio recording every day for the study period – 12 weeks. We appreciate that you may not always be able to listen everyday so we will also ask you to record how often you do listen, so we'll know if there is a link between amount listened and effect.

Additionally you will also be given a short DVD to watch at home explaining how the CD programme works. If you do not have a DVD player at home there will be one you can use at work.

During this research period you will be asked to fill out the same questionnaires 4 times, at the start, after 4 weeks, at the end of the 12 weeks and finally after a few months have lapsed (26 weeks). The questionnaires are quick and easy to fill out and will take only 15 – 20 mins.   Apart from the first appointment, these will be posted to your home address with a stamped addressed envelope for you to return. At the end of the study we would also like to conduct some interviews to more fully understand some of the participants' views on the

programme. I will contact some participants later, by letter, to ask for their consent to interview. You will have the choice whether or not to take part in interviews.

About the CDs

The music relaxation training is on 3 CDs each with a 4 x 18 minute recording of guitar music, played in a dorian mode of music which is neither a major or minor key. Listening to this music every day may help you feel more relaxed and more positive.

The verbal relaxation training is on 3 CDs, each with 4 x 18 minute recordings based on sports performance. Listening to these every day may help you feel more relaxed and more positive.

You listen to the same track every day for a week and then go onto the next track and listen to that every day for a week, in this way you listen to the programme's 12 tracks over 12 weeks.

We will post CD2 and CD3 to you during the study period.

The CDs are relaxation CDs and so should not be listened to whilst driving, operating machinery or in any circumstance where it may be dangerous to fall asleep.

At the end of the study we will offer you the CDs to keep. We cannot promise listening to the CDs will help you but the information we get will help us understand more about what helps people have good mental health.

Participation is voluntary and any question can be skipped. All information collected from you will have your name removed, be given an anonymous number and so will be anonymous. If these measures indicate that you may have significant levels of anxiety, stress or depression, we will let you know this and advise you to contact your G.P. All collected information will be strictly confidential and will be available only to the researcher and relevant staff from the NHS or university. All will have a duty of confidentiality to you as a research participant and will do their best to meet this duty. It may be possible that future research in this subject may be undertaken and a researcher may wish to have your help again. If you agree to this now it does not mean that you are committed to this later.

By signing the consent form you are agreeing to participate in this research study, which involves listening to CDs and completing short questionnaires about your health, wellbeing and work.

If you have any queries or want to discuss this further you can contact a member of the research team on (work number inserted here)

Thank you.

Sheila Ross

These training programmes are produced by Positive Rewards Ltd. of which Sheila Ross is a director and shareholder.

1.4 Participant Entry Interview Protocol Check Sheet for Research Administrator

Prior to entry interview, participant letter has been given with more than 24 hours to think about it.

At interview

	√

1 Employee signs consent – one copy for participant(employee) and one to keep on file

2 Participant completes the contact details from – discuss pros and cons of whether to receive questionnaire packs, reminder emails/phone calls at home or at work.

3 Ask about exclusions - if **Yes** to - Schizophrenia/bipolar disorder/family history bipolar disorder? and/or **No** to Able to hear & understand English? then cannot be in the study

4 Participant completes the intake questionnaire – check all boxes been completed

5 Participant given initial questionnaire pack to complete – either there and then or to take away and return. Emphasise that the questionnaire should not take long, no longer than 20 mins for them all, not to think about the questions too much, to trust their first reaction/response and that there are no right or wrong answers

6 CD pack #1 given (write this number on the forms) – explain that this will have a DVD to watch once and a CD to begin listening to everyday. The CD will have 4 tracks on it, each about 15 mins long, and to listen to the first track everyday for a week, and then go onto the next track (ie track 2) and to listen to that (only) every day for a week and to listen to the 3rd track the following week, and so step wise work your way through the programme.

7 Explain that we appreciate that it may not be possible to listen everyday so encourage the participant to record how often they have listened, on the listening diary on the back of the CD box. We appreciate honesty as this will help our research

8 These are relaxation CDs so don't listen in the car or somewhere where its not safe to fall asleep

9 Participation is confidential; please ask not to discuss their participation with their colleagues. Can discuss with those at home.

10 As this is a research study, please complete the questionnaires they will be sent later and to return these with the CD and listening diary (they'll be offered the CDs to keep at the end of the study)

11 Thank them for their participation, its very helpful and hope they enjoy listening

12 Reassure they can contact you if need to.

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1.5 Summary Sheet of Questions and Answers

What is Involved?	You will be given 3 CDs each with 4 x 18 min tracks on them. You are asked to listen to the same track everyday for a week (or approx 5 times in the week) and to work your way through the 12 tracks over 12 weeks – you will probably find it very relaxing. There is also a short DVD (9 mins) to watch which explains what the programme is about. You will be asked to fill out some questionnaires at the start, at the end of listening to CD1 (at 4 weeks), at the end CD3 (12 weeks) and 6 months later tomeasure any effects. We will also ask you to record how often you listen to the CDs
How much time will it take me?	18 mins a day for 12 weeks and then the questionnaires will take about 15 – 20 mins (asked to fill these in 4 times over 6 months)
Will it cost me anything?	No – its free to participate .
Can I choose which group to go into?	No – you will be allocated into either the words or music group by chance (randomly)
Can you tell me more about it?	The programme is designed to help you cope better through feeling more relaxed
Which group is better?	We don't know the answer yet - that is why we are doing this study
Can I keep the CDs?	You are asked to return these during the study but at the end you will be given the opportunity to have the programme that is the most effective
What if I don't manage to listen as often as you want?	That doesn't matter – but we ask that you record how often you do listen – just be honest
Are there any side effects?	No negative side effects, you may feel more relaxed and positive though. As they are relaxation CDs you must not drive when listening
Can I drop out?	Yes
What if I don't have a CD player or DVD player?	We can lend you a CD player and you can watch the DVD here (where?)
Can anyone do this?	Yes with a few exceptions, people with psychotic or bi-polar disorders are not suitable.
Can I think about it?	Yes – you can discuss it with your friends and family, but , as this is a research study, we ask that you do not discuss your participation with your work colleagues – to keep participation anonymous.
What involvement has Positive Rewards?	Positive Rewards is a company co-owned by Sheila Ross which makes audio CDs for healthy living. Sheila is studying the effectiveness of

Examples of study graphics – A4 poster

1.7 Participant Booklet of Questionnaire – week 12 pack

ID No   1

Week No   12

Feel Good?

Dear Study Participant,

I enclose your week 12 questionnaires for completion.

I would be most grateful if you could complete the enclosed questionnaires and return them in the stamped addressed envelope enclosed.

Please remember to include the previous CD and your listening diary even if it is not complete!

Thanks you for your ongoing participation with this study.

Please remember if you have any queries contact a member of the research team on 07887 628 120 or email nss.feelgoodproject@nhs.net

Kind regards

Sheila Ross

| ID No | 1 | | Week No | 12 |

Feel Good?

ID No. [1]   **Date Completed** [   ]

Please circle a number 0, 1, 2, 3 or 4 to indicate how much you agree with the following statements as they apply to you over the last **month**.

If a particular situation has not occurred recently, answer according to how you think you would have felt.

		Not true at all	Rarely true	Some-times true	Often true	True nearly all the time
1	I am able to adapt when change occurs	0	1	2	3	4
2	I can deal with whatever comes my way	0	1	2	3	4
3	I try to see the humorous side of things when I am faced with problems	0	1	2	3	4
4	Having to cope with stress can make me stronger	0	1	2	3	4
5	I tend to bounce back after illness, injury or other hardships	0	1	2	3	4
6	I believe I can achieve my goals, even if there are obstacles	0	1	2	3	4
7	Under pressure, I stay focused and think clearly	0	1	2	3	4
8	I am not easily discouraged by failure	0	1	2	3	4
9	I think of myself as a strong person when dealing with life's challenges and difficulties	0	1	2	3	4
10	I am able to handle unpleasant or painful feelings like sadness, fear and anger	0	1	2	3	4

Week No   12

CDRISC   Page 3

Feel Good?

ID No. | 1 | **Date Completed** | |

Listed below there are 16 statements of job-related feelings. Please read each statement carefully and decide if you ever feel this way about your job.

If you have never had this feeling, write a 0 in the box before the statement.

If you have had this feeling, indicate how often you feel it by writing the number (from 0 to 6) that best describes how frequently you feel that way.

The rating scale is as follows:

0	Never
1	A few times a year or less
2	Once a month or less
3	A few times a month
4	Once a week
5	A few times a week
6	Every day

How often 0 – 6

No.		Statement
1		I feel emotionally drained from my work
2		I feel used up at the end of the workday
3		I feel tired when I get up in the morning and have to face another day on the job
4		Working all day is really a strain for me
5		I can effectively solve the problems that arise in my work
6		I feel burned out from my work
7		I feel I am making an effective contribution to what this organisation does
8		I have become less interested in my work since I started this job
9		I have become less enthusiastic about my work
10		In my opinion I am good at my job
11		I feel exhilarated when I accomplish something at work
12		I have accomplished many worthwhile things in this job
13		I just want to do my job and not be bothered
14		I have become more cynical about whether my work contributes anything
15		I doubt the significance of my work
16		At work I feel confident that I am effective at getting things done

Week No 12

MBI   Page 4

Feel Good?

ID No. 1   **Date Completed** [   ]

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much
the statement applied to you **over the last week**. There are no right or wrong answers.

Do not spend too much time on any statement

The rating scale is as follows:
- 0   Did not apply to me at all
- 1   Applied to me to some degree, or some of the time
- 2   Applied to me to a considerable degree, or a good part of time
- 3   Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tend to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Week No   12

DAS821   Page   5

Feel Good?

ID No. [1]   **Date Completed** [   ]

Below are some statements about feelings and thoughts

Please tick the box that best describes your experience of each over the last 2 weeks

Statements	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future					
I've been feeling useful					
I've been feeling relaxed					
I've been feeling interested in other people					
I've had energy to spare					
I've been dealing with problems well					
I've been thinking clearly					
I've been feeling good about myself					
I've been feeling close to other people					
I've been feeling confident					
I've been able to make up my own mind about things					
I've been feeling loved					
I've been interested in new things					
I've been feeling cheerful					

Week No [12]

WEMWBS   **Page**   6

Feel Good?

Date Completed [   ]

The purpose of this inventory, is to characterise your experience of mindfulness. Please use the **last few days** as the time-frame to consider each item. Provide an answer for every statement as best you can. Please answer as honestly and spontaneously as possible. There are neither 'right' nor 'wrong' answers, nor 'good' or 'bad' responses. What is important to us is your own personal experience.

Thanks very much for all your effort!

		Rarely	Occasion-ally	Fairly often	Almost always
1	I am open to the experience of the present moment				
2	I sense my body, whether eating, cooking, cleaning or talking				
3	When I notice an absence of mind, I gently return to the experience of the here and now				
4	I am able to appreciate myself				
5	I pay attention to what's behind my actions				
6	I see my mistakes and difficulties without judging them				
7	I feel connected to my experience in the here-and-now				
8	I accept unpleasant experiences				
9	I am friendly to myself when things go wrong				
10	I watch my feelings without getting lost in them				
11	In difficult situations, I can pause without immediately reacting				
12	I experience moments of inner peace and ease, even when things get hectic and stressful				
13	I am impatient with myself and with others				
14	I am able to smile when I notice how I sometimes make life difficult				

Week No 12

FM1   Page 7

Feel Good?

Thank you

Please now return these, along with your listening diary and previous CD, in the stamped addressed envelope enclosed to:

National Services Scotland

Feel Good Project

SNBTS Ellens Glen Road

21 Ellen's Glen Road

Edinburgh   EH17 7QT

ID No	1		Week No	12

1.8 Consent Form

(Form to be on headed paper)   <u>Form no 1</u>   Study ID number _____:

Title of Project: Promoting mental health and wellbeing in a working population.

Name of Researcher: Sheila Ross   Please initial box

1. I confirm that I have read and understand the information sheet dated....................
 for the above study. I have had the opportunity to consider the information, ask questions
and have had these answered satisfactorily.   ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time
without giving any reason, without my medical care, work record or legal rights being affected.   ☐

3. I understand that data collected during the study may be looked at by relevant individuals from
Edinburgh University or from the NHS. I give permission for these individuals to have access to my
data.   ☐

4. I understand that results from the study will be published as a university thesis and will be   ☐
published in academic journals / presentations. All such results will have any identifying information
removed, such that individual participants could not be readily identified from the results.

5. I agree to take part in the above study.   ☐

_____ _____ _____
Name of Participant   Date   Signature

_____ _____ _____

Name of Person   Date   Signature
taking consent

Optional
6. I agree to being contacted in the future (within the next 10 years) to see if I am interested in   ☐
participating in research related to this present research. By agreeing to this now I understand
that this does not mean that I am committed to taking part in any future research.

_____ _____ _____
Name of Participant   Date   Signature

_____ _____ _____

Name of Person   Date   Signature
taking consent

                                 When completed, 1 for participant; 1 (original) for researcher site
                                 file

1.9   Participant contact details form

<u>Study Contact Details form</u>

Thank you for agreeing to take part in this study. We require a few details to register you into the study. Please can you provide us with details of where we can send the study questionnaires and CDs . Can you please also let us have a telephone and/or email that we can contact you on.

1. Name _____   2.   Study ID number_____

<u>3. Study Exclusions?</u>

Schizophrenia/bipolar disorder/family history bipolar disorder?   Yes/no *(please circle)*

Able to hear & understand English?   Yes/no *(please circle)*

<u>Contact Details</u>

4. Address _____

_____

_____

5. Email _____

6. Telephone _____

7. Can we leave a message on this phone? Yes/no *(please circle)*

This form is to be held by Research Administrator along with the consent form and master randomisation key in locked filing cabinet within Occupational Health, Ellens Glen Road and separate from questionnaires.

1.10 Study Intake Form

Promoting Mental Health and Wellbeing in a working population

<u>Study Intake Questionnaire</u>

Thank you for agreeing to take part in this study. We need a few details to register you into the study.

Study ID   number _____   Date _____

Male / Female *(please circle)*   Age _____

Place of Work _____

Part time/full time *(please circle)*

This form to be sent to Sheila Ross at Ellens Glen Road , along with other questionnaires

1.11 Sample VRT CD scripts

Sample VRT and MRT audio programmes are on the on back cover. Mp3 versions available on request – sheila@positiverewards.co.uk

Sample scripts are below. Others available on request.

<u>CD1 Track 3 Mental Relaxation 1</u>
Take some time to make yourself really comfortable, either sitting or lying down, allow your eyes to close and begin by focusing on your breathing. In a moment I am going to ask you to take in a deep breath and hold your breath, noticing the tension in your body as you do this and then as you breathe out you will begin to sink into a calm and comfortable state of relaxation. Now take in a deep breath and hold your breath, keep holding your breath noticing the tensions and now breathe out and as you breathe out allow your body to relax. And allow the relaxation to spread throughout your body to every part of your body. Take in another deep breath, breathing all the way down to your stomach and as your breath out let all your muscles relax. Continue breathing calmly and evenly, following

the sound of your breath as your breathe in and as you breathe out, breathing in your own natural rhythm, gentle and relaxed, not trying to relax but just letting it happen, aware of your stomach rising with every breath in…Each time you breath in you take in a portion of calm relaxation and as you breath out you draw it deep inside yourself, breathing in calm, breathing out relaxation, letting all the muscle sin your body relax. As you continue paying attention to your breathing in this way, following the sound of your breathing, its natural to find that your mind floats away, so that the everyday sounds around you become more remote, as if fading away into the distance. You are able to focus on my voice while all other sounds drift away, able to tune out outside disturbances if you had a dial on the radio. And as you listen to my voice in this way, you become more and more relaxed, feeling calm and peaceful.

Notice how very relaxed your feet and toes are feeling, and allow them to relax even more, feeling heavy and relaxed, and let that warm relaxation spread up your legs so that all your leg muscles are heavy and relaxed. Notice your back, aware of what you are lying on and allowing your back to relax into this support. Allow your shoulders to relax even more, heavy and relaxed and feel the increased sense of relaxation spread down your arms to your hands and fingertips, heavy and warm.

And now be aware of your neck and head, relaxed and comfortable. |Your whole face is relaxed, your forehead is smooth and relaxed, your eyelids , your jaw, your cheeks, lips so that they are slightly apart and your tongue resting gently on the floor of your mouth, Every muscle in your face is completely relaxed and heavy.
And as your body becomes more and more relaxed so your mind becomes more and more relaxed, you are aware of any thoughts that drift into your mind and are able to let them go, no need to catch hold of any. You are feeling calm, safe, peaceful and secure. With every breath you take in you are feeling more and more calm, more and more relaxed. Breathing deeply and slowly, in and out …..in and out, deeper and deeper relaxation, enjoying this pleasant state of deep relaxation.
And now imagine you are standing at the top of a stairway or escalator that moves down to a even more calm and relaxed state. You can allow yourself to begin moving down the stairs or escalator, and as you go down   you feel more calm & relaxed, more safe and more secure. Continue going down until you feel sufficiently safe and comfortable, and when you feel this, feeling safe and good and comfortable allow yourself to leave the stairs and relax on your own until I speak you again.   If you haven't already left the stairs allow yourself to do so now feeling safe and secure, feeling relaxed and calm and good in every way..   As you continue relaxing in this way recognise that you have reached a place that is very special to you, that really feels good to you.

Were going to call this special state, this safe relaxed state, your inner mental room, your own private room in your mind. This room can be a room like any other room, or it could be outside in the country or a park. It may be a room or a place that you've been before that you really enjoyed being, or it may be a place that you create all by yourself.
Allow yourself to make this room exactly the way you want it to be so that you can really relax , so that you can feel really safe and comfortable here.   Put in a sofa or a comfortable chair so that you can sit or lie down and relax.   From now on we'll call this your inner mental room. You can do many things here, recharge and revitalise yourself or relax and work on things in different ways. Furnish the room, so that you can feel really relaxed here, so that you can feel safe and comfortable, and can find your way back whenever you need to.
Now I'm going to suggest that you to put some things in your room. Put in a fireplace with a warm safe fire in it that gives out rays of light and heat that re-energise your mind and body.   Allow yourself to stand or sit next to this fireplace And feel the warmth of its rays filling your body with energy and inner strength. Just relax for the moment and enjoy this pleasant energising feeling until I speak to you again.   Next I would like you to put in a writing board or a blackboard. You can write words on this board, words that are important to you, words you want to hold onto. You can write down the way that you want to feel when you wake up. Words like strong, safe calm and happy. Write some words now on this board – words which express how you want to feel when you wake up, perhaps positive and relaxed. See them written on the board, see them clearly in your minds eye.   In a few moments I'm going to suggest you leave your inner mental room.

You can return to your mental room whenever you want to , just close your eyes, take three deep breaths, and you will be there. You can spend as long as you want there safely, aware of all common dangers. You can rest and regenerate yourself, change the words on your blackboard and work on any problems you need to.
And when you go to your mental room you will be able to relax completely, able to connect with this state and these feelings of calm relaxation, And every time you practise going to your inner mental room it will become easier and more effective and you will experience stronger feelings of safety and security.
  So now just relax and enjoy the good positive feelings in this place. When you want to, wake up by taking a few deep breaths, and when you wake up, before you open your eyes, stretch out your muscles, and when you wake up you will feel relaxed and happy and good in every way.

CD2 Track 1 - Self confidence

Sit or lie down and make yourself as comfortable as possible. In a moment I'll ask you to clench your left hand and take in a deep breath and then hold your breath,   when you then breathe out and relax your left hand, you will immediately begin to sink down into a calm and wonderful state of relaxation. Clench your left hand now as hard as you can, take in a deep breath, as deep as possible,   hold your breath,   hold your breath, feel the tensing in your left hand and chest,   hold your breath, and now breathe out and allow your eyes to close,   relax your left hand and every part of your body and sink down into a lovely and pleasurable state of being. Let this relaxation spread throughout your whole body, to every part of your body, breathe calmly and evenly, noticing that every time you breathe out you relax more and more. Don't try to relax, just let it happen, just take in the relaxation that comes each time that you breathe out,   let each breath out bring with it an increased sense of relaxation. Each time you breathe out you can relax more and more, deeper and deeper, Go ahead and relax on your own now for a few minutes and while you do you can take yourself to your inner mental room, a place where you can relax totally, and I'll make contact with you again there shortly. Relax on your own now, each time you breathe out let it take you down to a calm beautiful and restful place, your inner mental room.
 As you continue relaxing I'm going to give you a few pictures and suggestions that will help you increase your self confidence, that will help you look at yourself in a more positive way, that will help you to value yourself even more than you already do, that will help you respect yourself more, that will help you to have an even better feeling when you think about yourself . These suggestions and pictures that you receive while you are in this state are going to build up your self image, increase your self confidence, and increase your good feelings about yourself. These pictures and suggestions that you receive will affect the way you think, the way that you feel and the way that you act, they'll change your attitude to yourself and you'll see yourself in a more positive way. Afterwards you'll notice each and every change that is positive and this will make you happy. The relaxation training in combination with these suggestions and visualisations will give you increased energy , you'll feel more alert, energetic able to do more , you'll be more effective and resourceful, you'll be able to take the initiative and better be able to accomplish whatever task you set for yourself, You'll find that your nerves are stronger and that you'll feel more stable, your thoughts will be calmer and clearer, more controlled, more collected and balanced, more filled with satisfaction, and you'll have an easier and easier time focusing and concentrating and paying attention to whatever it is you're doing at that moment, you'll be able to detach your thoughts from issues that are at that moment irrelevant, and you'll have an increased ability to keep concentration and focus in the midst of disturbances. You'll be able to see things exactly the way they are without making difficulties seem larger than they really are, and without losing your sense of perspective. You'll also be able to look at things that happen in a more positive way. You'll discover that there's something positive to be found in everything that happens you'll find that you can never ever fail and you'll be able to learn from your mistakes, you'll experience that you'll grow as a result of difficulties, you'll experience problems as solutions, hindrances as challenges, this means that you'll be able to face the future with a deep feeling of calm assurance and self confidence. You'll be able to look at coming events with a feeling of confidence and positive expectation, you'll be able to stand up for yourself more, You will realise that you too have the right to become angry that you too have the right to be sad, you will realise that your feelings are as important as those of other people. You will more easily express your own ideas, you will realise that your ideas are as important as those of other people, that you are as important a person

as anyone else. Every day you will experience an increase of inner safety, inner security, and personal well being, you will become more aware of your resources and your potential, day by day your trust in your own abilities will increase, day by day your feeling of safety and inner security will grow, day by day your self-esteem, your self respect and your self confidence will steadily develop. You can allow yourself to relax on your own now and absorb all this information, let it sink deep down inside you .Allow yourself to picture yourself in some future situation and see how your increased self confidence enables you to handle this situation better than you ever have before. Allow yourself to move into this situation and experience how much better you manage it than you ever have before.

With the help of this training your overall picture of yourself will become more and more positive, you'll experience that your picture of yourself and your personal resources will grow more and more and become more and more positive. You'll experience how your self confidence and your good feelings about yourself will simply grow and grow as each day goes by. These feelings of self confidence and security increase with each and every day that goes by. When you wake up you will retain some of these feelings of calm assurance and inner balance. You'll feel rested and cheerful, you'll know that the suggestions and pictures that you've just received will rest with you and will affect the way of thinking and feeling and acting that you now have at your command. These suggestions and pictures will enable you to look forward in time with a deep feeling of self confidence and positive expectation.

So for now, just relax and enjoy the peaceful feelings of calm relaxation in this place, and when you want to wake up, wake up in your own time and before you open your eyes, take a few deep breaths and stretch your muscles and when you wake up, you will feel relaxed, refreshed, strong and happy .

CD2 Track 2 - Problem solving

Sit or lie down and make yourself as comfortable as possible. In a moment I'll ask you to clench your left hand and take in a deep breath and then hold your breath, when you then breathe out and relax your left hand, you will immediately begin to sink down into a calm and wonderful state of relaxation. Clench your left hand now as hard as you can, take in a deep breath, as deep as possible, hold your breath, hold your breath, feel the tensing in your left hand and chest, hold your breath, and now breathe out and allow your eyes to close, relax your left hand and every part of your body and sink down into a lovely and pleasurable state of being. Let this relaxation spread throughout your whole body, to every part of your body, breathe calmly and evenly, noticing that every time you breathe out you relax more and more. Don't try to relax, just let it happen, just take in the relaxation that comes each time that you breathe out, let each breath out bring with it an increased sense of relaxation. Each time you breathe out you can relax more and more, deeper and deeper, Go ahead and relax on your own now for a few minutes and while you do you can take yourself to your inner mental room, a place where you can relax totally, and I'll make contact with you again there shortly. Relax on your own now, each time you breathe out let it take you down to a calm beautiful and restful place, your inner mental room.

Continue to relax in your inner mental room and experience the feeling of calm and rest that you have there. You're now going to have the opportunity to expand on that calm feeling of assurance and security, you're going to have the opportunity to build up a very strong inner feeling of safety and security. Imagine that when you breathe in you rise up and get a portion of calmness, strength, and security to yourself, and then when you breathe out you can bring those feelings down into your inner self, when you breathe in you rise up and receive another portion and then you bring the feelings down into yourself, deep into your inner self when you breathe out. allow yourself to continue on your own in this manner for a few moments. each time you breathe out you simply allow these feelings of calm security to fill you more and more

You may now experience an intense feeling of calm inner confidence and security. This means that no matter what you think of you'll be able to feel totally calm and secure in every way. You'll now have the opportunity to go through a few situations in your mind where you've had problems previously you'll be able to experience them now feeling totally calm and secure and full of self confidence. You can use your movie camera for this on the screen your going to show yourself situations that you yourself have chosen. Today were just going to rehearse a few of these situations that you've chosen. In just a moment you'll be seeing the experience that you have chosen for

yourself today, however while you experience this scene you may allow yourself to feel totally safe and secure and self assured the entire time. The film begins now, allow yourself to step right into it experiencing it intensely as if it were happening right now, but as you remain totally calm the entire time.

We'll stop the film now and relax thinking only about relaxation, thinking only of enjoying the calm feeling of security and assurance that you yourself have created. Now allow the film start again and allow yourself to get back into the same situation and experience it in the same time and the same way that you just did, remembering that you can keep the same feelings of calmness and security with you.

Now we'll stop the film again and just think about relaxing just enjoying that feeling of calmness and security and beautiful rest and assurance that you're having.
And allow the film to start rolling again now allowing yourself to get into the same situation while at the same time remaining calm and full of assurance. And now allow the film to end again as you relax totally and completely, allowing yourself to feel calm and good
You have now experienced this situation three times. This has now become imprinted in your mind and will be available to you from now on as you've created a link between the situation that you chose and the feelings of calm assurance and security that you felt. Your memories and experiences that you've just had will be available to you when you encounter such situations in real life, you'll feel totally calm and full of inner strength every time you encounter such situations, if you should wish to expand on that feeling just take in a couple of deep breaths and allow yourself to be filled even more by feelings of calm assurance and security. As you breathe out you carry the feeling with you of being able to master these situations, this will allow you to anticipate such a situation, with feelings of self assurance and confidence. After you've awakened you'll feel rested and alert, this feeling of calm assurance may remain with you, you'll have a sense of well being and cheerfulness, and you'll be able to face the future with confidence. Now Take some deep breaths in slowly and wake up, in your own time, before you open your eyes you can stretch out your body, and when you open your eyes you will feel open minded, relaxed and good in every way.

CD3 Track 4 - Vision for the Future

Sit or lie down and make yourself as comfortable as possible. In a moment I'll ask you to clench your left hand and take in a deep breath and then hold your breath, when you then breathe out and relax your left hand, you will immediately begin to sink down into a calm and wonderful state of relaxation. Clench your left hand now as hard as you can, take in a deep breath, as deep as possible, hold your breath, hold your breath, feel the tensing in your left hand and chest, hold your breath, and now breathe out and allow your eyes to close, relax your left hand and every part of your body and sink down into a lovely and pleasurable state of being. Let this relaxation spread throughout your whole body, to every part of your body, breathe calmly and evenly, noticing that every time you breathe out you relax more and more. Don't try to relax, just let it happen, just take in the relaxation that comes each time that you breathe out, let each breath out bring with it an increased sense of relaxation. Each time you breathe out you can relax more and more, deeper and deeper, Go ahead and relax on your own now for a few minutes and while you do you can take yourself to your inner mental room, a place where you can relax totally, and I'll make contact with you again there shortly. Relax on your own now, each time you breathe out let it take you down to a calm beautiful and restful place, your inner mental room.
As you continue to relax and to be comfortable I will give you some mental pictures that will help you perform better and to help you with a better life. You previously learnt to programme concrete pictures of the future, you have also learnt to influence your body now through ideomotor pictures, you will now learn even more about using visualised goal steering to influence you life and your body. You can start by creating an initial picture that expresses a life goal or a career goal. It could be a specific picture, where you have achieved a goal in sport or work. It can also be a goal where you have created a better existence for other people, for example, making the world better through spreading happiness to other people. You can also combine these two visualisations.
I want you now to create such a vision and for the next minute let it meld deep down.
This picture has now been imprinted deep in your inner mind and will always be with you in the future. It will give you a lot of energy, inspiration and motivation. It will create a strong personal vision and help you move towards this goal. It will give you energy every day that will carry you

forward, it will also give you a sense of increased meaning, that what you do is important in a larger context, a feeling that you are important.

You will now do 2 exercises where you steer your body by creating visualised goal pictures. Chose a performance or a situation that you would like to improve and for the next minute you will visualise executing this performance, or dealing with the situation in the way that you normally do it, at the same time as you watch yourself from a spectator seat. Go ahead and do this now.

You may now leave this situation and listen to me. You can use this technique when you want to correct or improve something in your performance. By watching yourself from outside you will find it easier to see what it is you need to improve, or correct, in your performance.

Now we will move on to the next exercise. This time I want you to see yourself perform in an ideal way, I also want you to get emotionally involved in the situation, feel your body performing, feel that you are in your body and in the performance and that you are experiencing it from the inside. Go ahead now and visualise your ideal performance from the inside.

You can now leave this situation and listen to me again. Every time you experience a good performance in this way, your brain and body will learn the perfect way of performing, you create an experience of the ideal performance situation. You create a state that can automatically return at every important opportunity.

These exercises will teach you how you can, through integrated visualised pictures, create energy, motivation and involvement, energy for the steps to carry your through the exercises and training along the path to your chosen goals. The training will also teach you that, through integrating specific pictures of the future in your mental room, this will automatically steer you to your future goals, without needing to consciously think about what you are doing. You also learn that through creating perfect pictures of your performance you can create the perfect performance. It will also help you to automatically improve your performance; you can create a feeling of flow, a feeling that everything happens by itself, in this automatic process. It also teaches you that you can talk to your body in every moment with the help of visualised goal pictures, in order to hand over to the body, to let it happen automatically and enjoy the feeling that the body and mind are executing what they have been told to do. Every time you use this programme you will feel that you become more secure in the use of goal pictures to programme and steer your body. The techniques will help you to better performances and to a better life in general. You can now take a few deep breaths and wake up in your own time, and when you wake up, before you open your eyes stretch out your arms and legs a little, and when you wake up you will feel relaxed, refreshed, and good in every way.

1.12 MRT & VRT DVD scripts

DVD script for Verbal Relaxation Training (VRT) and Music Relaxation Training (MRT)

Generic beginning

Hello, my name is Sheila Ross. I work in the area of health promotion helping to make people stronger, both physically and mentally. Thank you for agreeing to take part in this study which I am doing for a PhD with the University of Edinburgh. This study is about building mental strength and resilience, about helping you to feel better, to cope better with everyday life, both at home and at work, to help you stay on top and avoid, or lessen your risk of stress, anxiety or depression.

*Just as we know that there are certain things we can do to help ourselves keep physically well, such as eating healthy food s and taking exercise, we also know that there are things we can do to help ourselves keep mentally fit and well - healthy eating and exercise are important here too **but so is relaxation**.*

Relaxation is something which is often overlooked in our busy, stressed, fast paced world. It seems like such a natural thing that we sometimes think it will just come to us automatically when we need it, so we don't take the time to develop it.

*Only a few of us are taught **how** to relax, the rest of us just have to pick it up as we go along in life, and many of us never do.*

Relaxation is a skill, and like any other physical skill, it has to be learnt, and you have to practice to get better at it. When we first learn to ride a bike we may wobble about and feel unsteady but the next time we get on a bike our mind remembers the mental state and the skills that we had learnt from the time before, so we improve each time we do it.

By listening to these CDs you build up the ability to relax automatically. It becomes easier to relax more deeply each time you practice. Each time you go into a deeper state of relaxation, and the relaxation lasts for longer when you finish doing it.

Why study relaxation so much? Why is relaxation so important? Our minds have the most incredible resources available to help us but these resources are not available when we are stressed. Why is this? There's a part of the brain that solves problems for us. If we give someone a problem while scanning their brain we can see this part of the brain light up.

*It doesn't matter what the problem is, whether practical, social or emotional – so whether you are looking for keys or thinking about what to have for dinner, or talking to your boss about your work or your partner about something personal. To the brain these are all just problems and it is the **same** part of the brain that is involved with sorting them out for us. But if we are stressed this part of the brain is switched off. When we are stressed we don't have access to this problem solving area. We can no longer come up with new ideas or solutions to our problems. A simple example of this is when we are talking about a film*

This is why when we are stressed it is so difficult to take decisions, decide what to wear, what to say to people, and what to do to relax. Normally when this part of the brain is functioning well we are in a state of flow, we seem to effortlessly solve all our problems, but things that normally wouldn't trouble us at all seem insurmountable when we are stressed, we just can't find the solutions, although they are definitely there.

It is natural to have some stress or pressure in our life, and positive stress can help us do things, perform well and enjoy the challenge. We feel able to cope.

However if we feel we have too much stress or pressure this can make us tense - in both our bodies and our minds and this unhealthy for us. Too much stress causes a physical response in our body, we produce certain chemicals e.g., adrenaline, causing us to fight or run away . Our ancestors had to fight wild animals or hostile tribes to survive so this is a very powerful survival instinct. This can still be helpful if we are in a situation where we need to run or fight, but most often today this is not a practical way to deal with stress. We then have these chemicals in our bodies with no way of using them up – this is harmful to the body, making us sweat and have a racing heart.

We experience stress in both our minds and our bodies and the signs include things like headaches, muscle aches, sleeplessness, nervousness, anger and irritability . We can't let go of worries, thoughts just go round and round in our heads.

People are different so not everyone feels stress in the same way and we all have our own ways of dealing with stress. What stresses out one person may not stress another, we may have our own unique 'stressors' – things that provoke a stress response within us. Common ones are money problems, death of a close friend or relative and moving house. Often we don't know what is stressing us, and this can make us worry even more as we try to work out what's going on for us , which can make us feel trapped in our bad feelings.

We can often be unaware of carrying stress, and have background stress - nothing obvious but stressful none the less, and when we have background stress in our mind this alerts the body to prepare for danger which then feeds back to the mind to keep alert and ready for flight or fight and so it spirals, making it harder and harder to relax.

With relaxation we can stop the stress response, allow the body to come off 'alert status' .

To go to sleep we need to relax and not surprisingly one of the first symptoms of feeling stressed can be sleeplessness. Relaxation is about using only as much energy as we need for what we are doing, whether mental and/or physical. This way we are more efficient, perform better, think more clearly and because we are only using the energy we need we feel less tired and more energetic generally. Think of a golfer – to play well he/she must use only those muscles necessary for the shot , and , to keep a clear mind, free from worry. Tensing the body makes it more difficult for the performing muscles to work well and make it more tiring and we can all recognise how thinking negative thoughts

interferes with good performance. Athletes take of being' in the zone' – that mental place of complete focus.

Specific part for VRT

This DVD accompanies the first CD is part of a series of 3 which use the positive power of words. Words are very powerful and we easily absorb the negative words from the world around us. This programme can counteract such negative messages to help us feel better about ourselves, more relaxed and more positive, helping us cope better with the everyday stresses of life. By relaxing as you listen you can allow the positive words to sink deep into your mind. It can be thought of as a mental immunisation against stress.

Find a comfortable place for yourself to sit or lie down so that you can really relax as you listen to the CD. Allow all your muscles to release the tensions of the day and to relax comfortably. Allow the thoughts in your mind to just come and go, notice them without criticism or judgement. As you do this you may find your mind drifts off whilst you are listening, that's ok, just bring your attention back to the words and enjoy the relaxation that develops as you listen. Even when asleep your unconscious mind is still listening.

As you continue to practice listening and relaxing to the CDs you may find that it becomes easier and easier to relax at all times, when you are listening to the CD and also at other times. By learning relaxation in a relaxed environment you can begin to learn how to relax when stressed. A useful exercise to do is to notice when you feel tense and when you feel relaxed. Once your brain has learned to relax it will continue to use that skill automatically. When we are relaxed we feel more positive and can cope better with the everyday stresses of life.

Specific part for MRT

This DVD accompanies CD1, the first CD in a series of 3 which contains music written in the Dorian mode. This is a type of musical scale slightly different from the usual major and minor scales commonly used. This could be said to create a musical language which is more neutral in tone than the 'happy' feeling of a major scale or the 'sad' feeling of a minor scale. The ancient Greeks believed that the type of music listened to could affect an individual's character and subsequently their behaviour. Dorian mode music was believed to help you become stronger.

Find a comfortable place for yourself to sit or lie down so that you can really relax as you listen to the music. Allow all your muscles to release the tensions of the day and to relax comfortably. Allow the thoughts in your mind to just come and go, notice them without criticism or judgement. As you do this you may find your mind drifts off whilst you are listening, that's ok, just bring your attention back to the music and enjoy the relaxation that develops as you listen.

As you continue to practice listening and relaxing to the music you may find that it becomes easier and easier to relax at all times, when you are listening to the music, and also at other times. By learning relaxation in a relaxed environment you can begin to learn how to relax when stressed. A useful exercise to do is to notice when you feel tense and when you feel relaxed. Once your brain has learned to relax it will continue to use that skill automatically. When we are relaxed we feel more positive and can cope better with the everyday stresses of life.

Generic Ending

Thank you for your participation and I hope you enjoy the programme. Please remember to return all questionnaires and I look forward to sharing the results with you _____

1.13 CD inserts for VRT and MRT

For Further Information

As this is a research project, we are interested in the number of times you have listened to each track. Please tick the days you have listened and send this back along with the questionnaires and CD. *Your honesty is appreciated. Thank you.*

CD1	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Track 1							
Track 2							
Track 3							
Track 4							

Music Relaxation Training - CD 1

Instructions for Use

This CD has 4 tracks on it, each lasting 18 mins. Start with track 1 listening at least once a day for a week before moving on to the next track for a week, and so in this way moving stepwise through the CD.

As each track is about relaxation it is important to listen somewhere safe where it does not matter if you fall asleep. **Do not listen if you are driving, operating machinery or are in any situation where safety depends on you being alert.**

This CD is part of a series of 3 which contains music written in the Dorian mode. This is a type of musical scale slightly different from the usual major and minor scales commonly used. This could be said to create a musical language which is more neutral in tone than the 'happy' feeling of a major scale or the 'sad' feeling of a minor scale. The ancient Greeks believed that the type of music listened to could affect an individual's character and subsequently their behaviour. Dorian mode music was believed to help you become stronger.

Find a comfortable place for yourself to sit or lie down so that you can really relax as you listen to the music. Allow all your muscles to release the tensions of the day and to relax comfortably. Allow the thoughts in your mind to just come and go, notice them without criticism or judgement. As you do this you may find your mind drifts off whilst you are listening, that's ok, just bring your attention back to the music and enjoy the relaxation that develops as you listen.

As you continue to practice listening and relaxing to the music you may find that it becomes easier and easier to relax at all times, when you are listening to the music, and also at other times. By learning relaxation in a relaxed environment you can begin to learn how to relax when stressed. A useful exercise to do is to notice when you feel tense and when you feel relaxed. Once your brain has learned to relax it will continue to use that skill automatically.   When we are relaxed we feel more positive and can cope better with the everyday stresses of life.

For Further Information

As this is a research project, we are interested in the number of times you have listened to each track. Please tick the days you have listened and send this back along with the questionnaires and CD. *Your honesty is appreciated. Thank you.*

CD1	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Track 1							
Track 2							
Track 3							
Track 4							

STRONG

Relaxed Stay on top

Feel Good?

Verbal Relaxation Training - CD 1

Instructions for Use

This CD has 4 tracks on it, each lasting 18 mins. Start with track 1 listening at least once a day for a week before moving on to the next track for a week, and so in this way moving stepwise through the CD.

As each CD begins with relaxation it is important to listen somewhere safe where it does not matter if you fall asleep. Do not listen if you are driving, operating machinery or are in any situation where safety depends on you being alert.

This CD is part of a series of 3 which use the positive power of words. Words are very powerful and we easily absorb the negative words around us. This CD can counteract such negative messages to help us feel better about ourselves, more relaxed and more positive, helping us cope better with the everyday stresses of life. By relaxing as you listen you can allow the positive words to sink deep into your mind. It can be thought of as a mental immunisation against stress.

Find a comfortable place for yourself to sit or lie down so that you can really relax as you listen to the CD. Allow all your muscles to release

the tensions of the day and to relax comfortably. Allow the thoughts in your mind to just come and go, notice them without criticism or judgement. As you do this you may find your mind drifts off whilst you are listening, that's ok, just bring your attention back to the words and enjoy the relaxation that develops as you listen. Even when asleep your unconscious mind is still listening.

As you continue to practice listening and relaxing to the CDs you may find that it becomes easier and easier to relax at all times, when you are listening to the CD and also at other times. By learning relaxation in a relaxed environment you can begin to learn how to relax when stressed. A useful exercise to do is to notice when you feel tense and when you feel relaxed. Once your brain has learned to relax it will continue to use that skill automatically. When we are relaxed we feel more positive and can cope better with the everyday stresses of life.

2 Appendix for Study 1 Results

2.1 Boxplots of Age and Sex distributions in the Control and Intervention Groups

Box plots of Age and Sex distribution within the Control and Intervention Groups
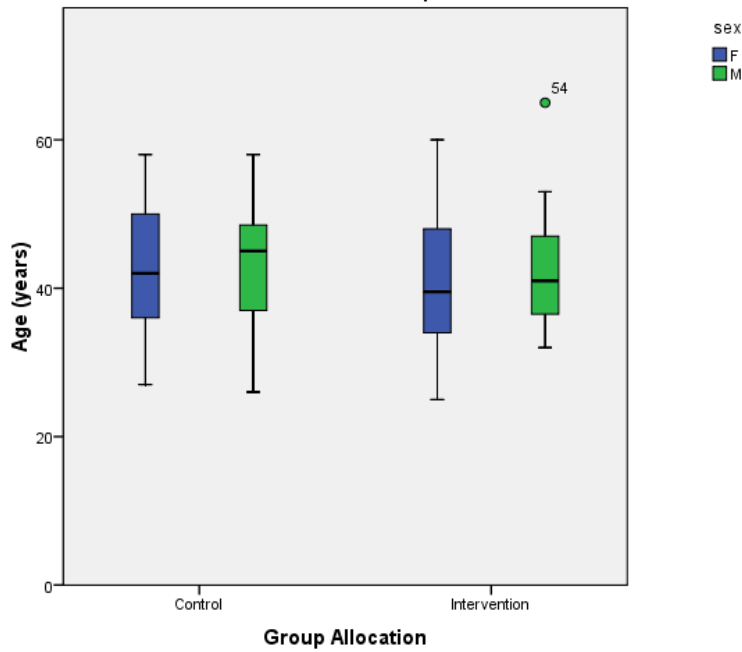
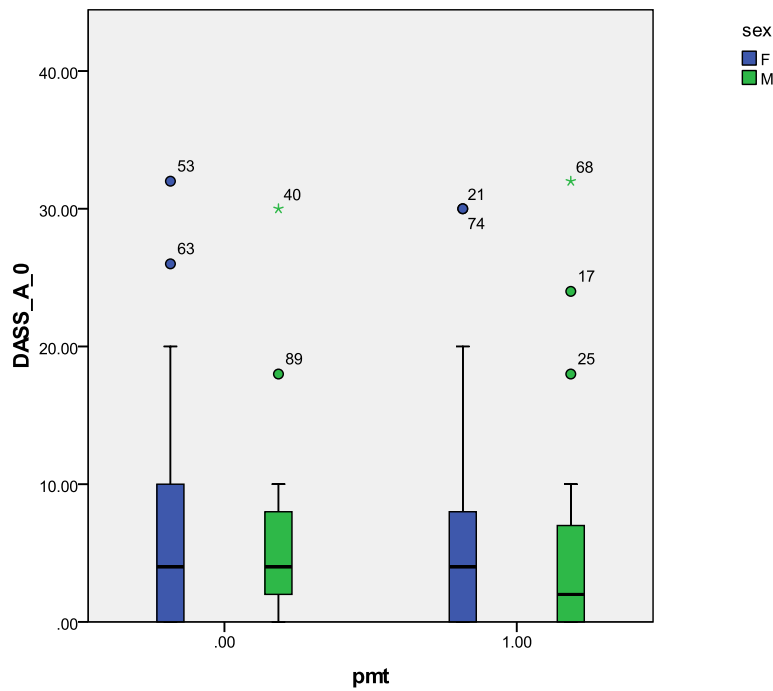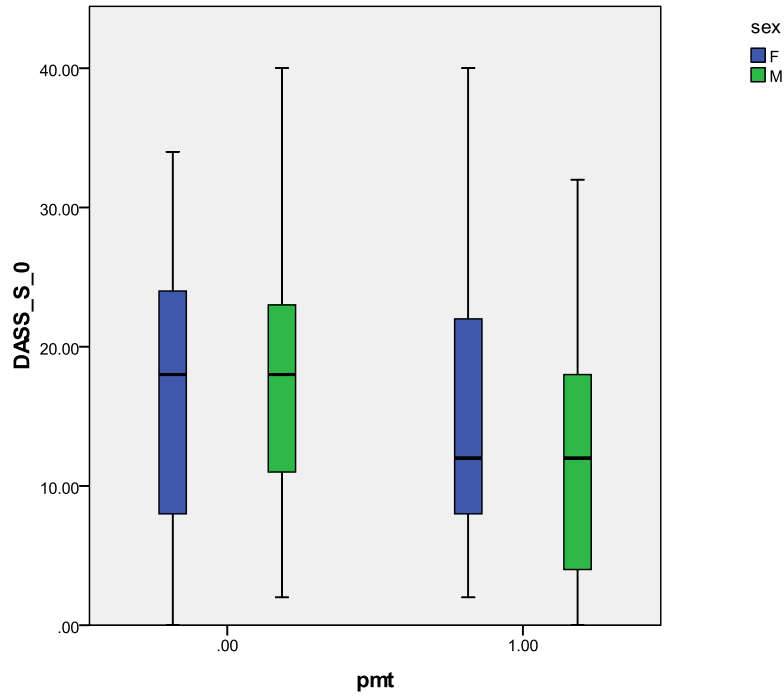## 2.2 Boxplots at time 0 for control and PMT group by gender for variables

1. Boxplot for variable CDRISC for control and PMT groups by gender at time 0
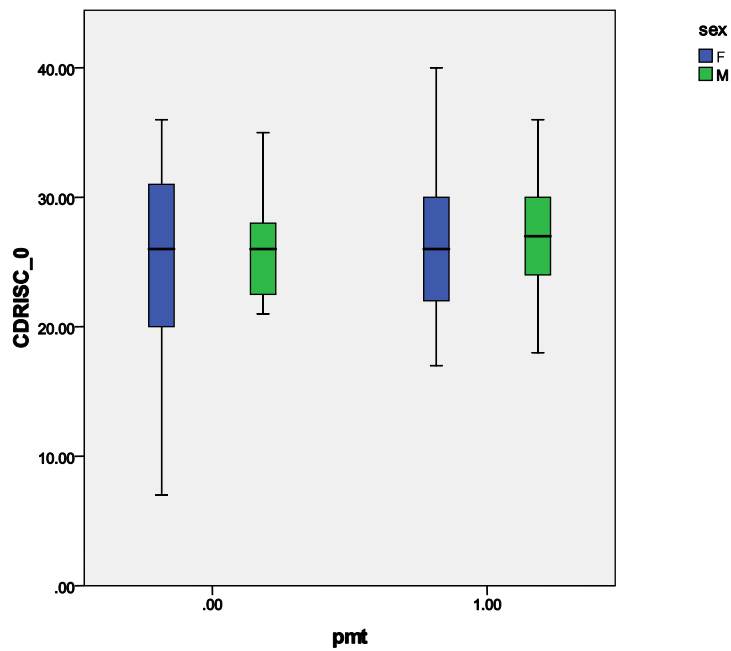
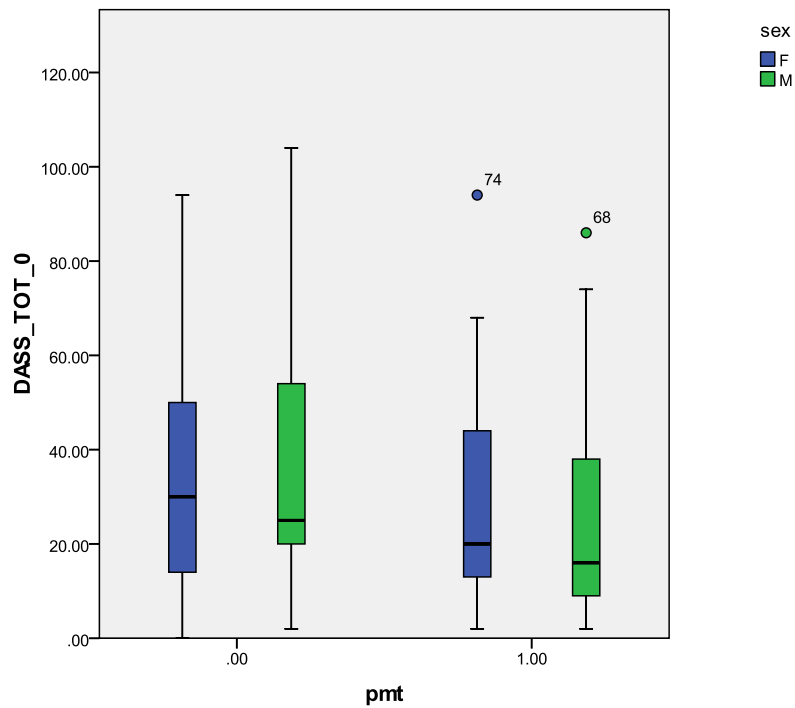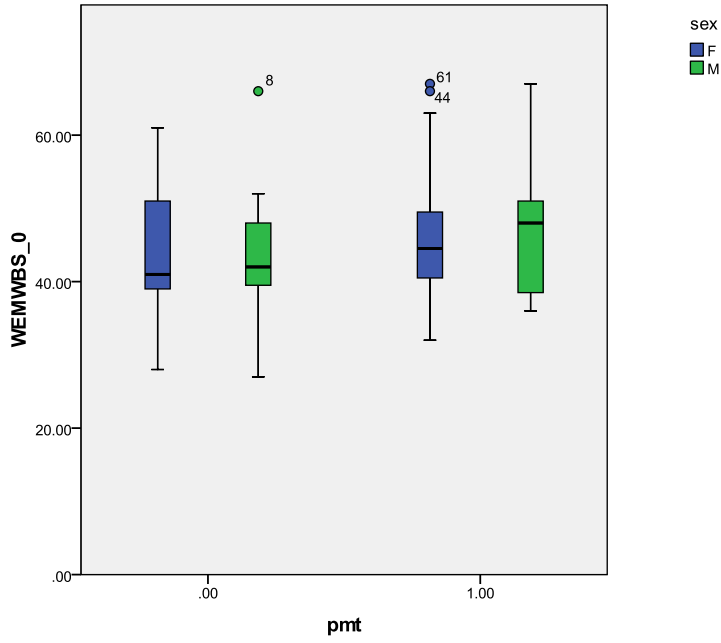2. Boxplot for variable MBI_EX for control and PMT groups by gender at time 0
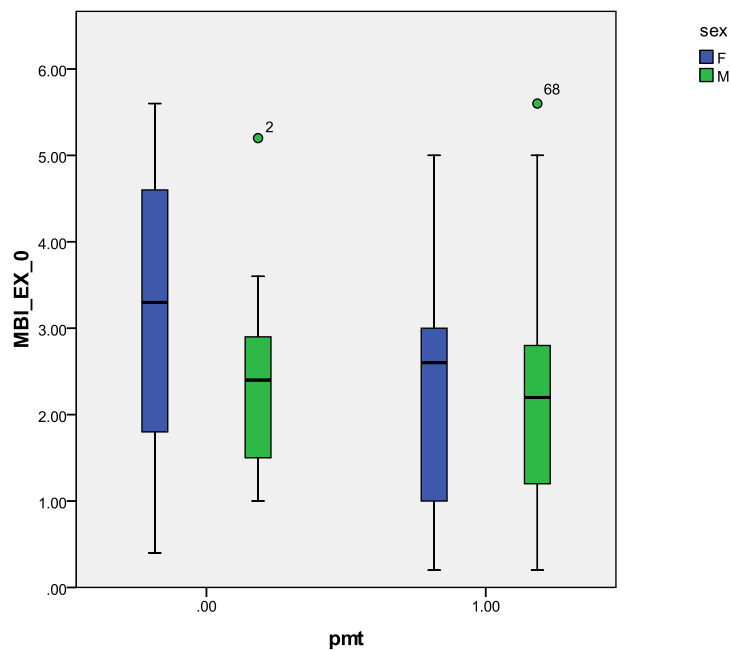
3.Boxplot for variable MBI_PE - control and PMT groups by gender at time 0
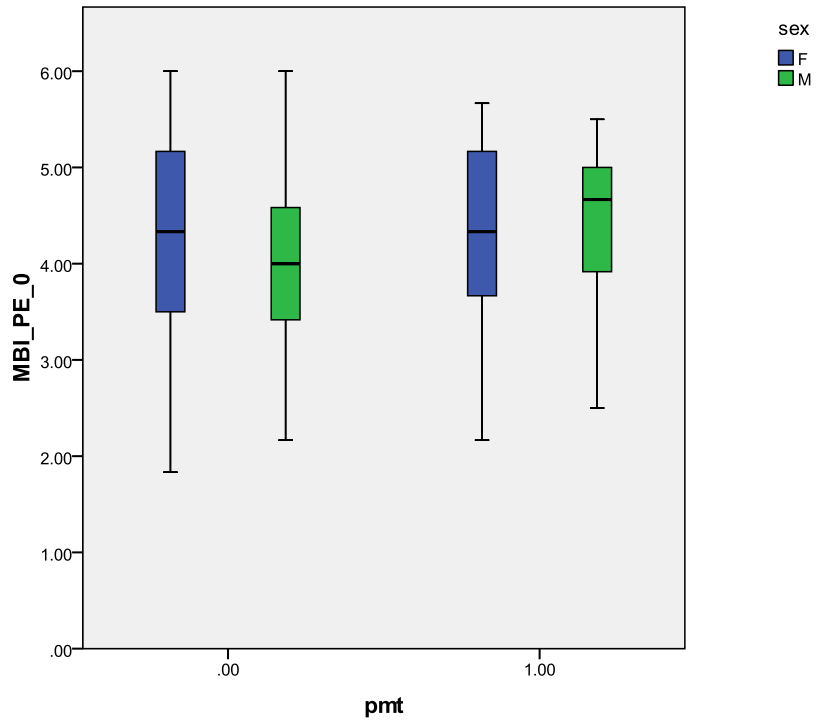
4. Boxplot for variable MBI_CY for control and PMT groups by gender at time 0
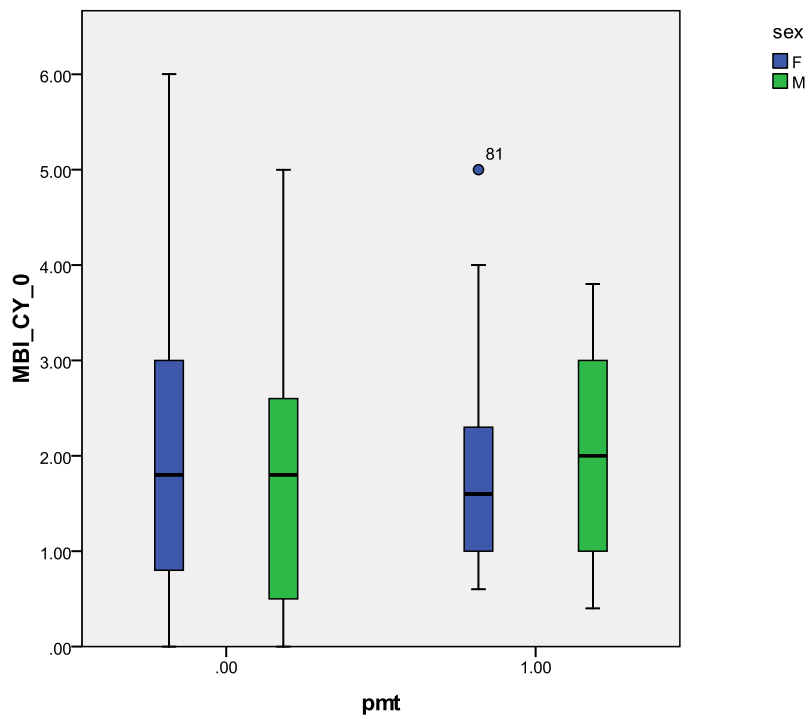
5. Boxplot for variable DASS_D for control and PMT groups by gender at time 0
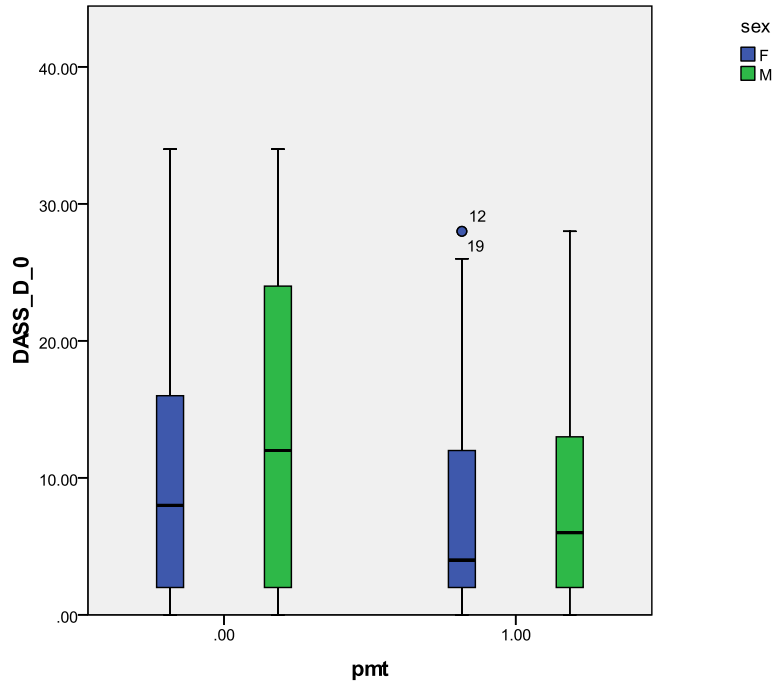
6. Boxplot for variable DASS_A for control and PMT groups by gender at time 0

7. Boxplot for variable DASS_S for control and PMT groups by gender at time 0

8. Boxplot for variable DASS_TOT for control and PMT groups by gender at time 0

9. Boxplot for variable WEMWBS for control and PMT groups by gender at time 0

10. Boxplot for variable FMI for control and PMT groups by gender at time 0
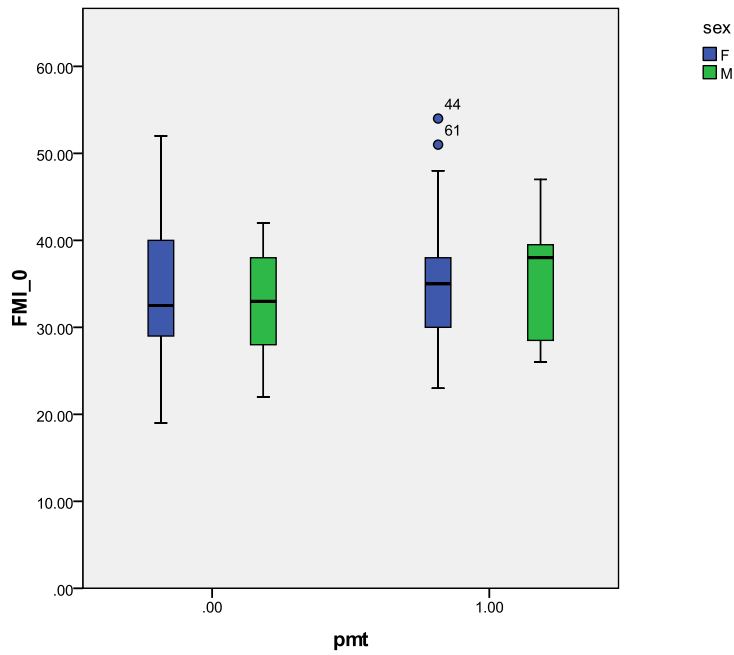
2.3 Baseline Normality Testing

Kolmogorov – Smirnov (K-S) test for normality in the variables split by group control (0) and PMT (1) at baseline, showing highlighted significantly non-normal distribution.

Variable	Group *	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
CDRISC	.00	.107	51	.200[*]
	1.00	.107	49	.200[*]
MBI_EX	.00	.083	51	.200[*]
	1.00	.142	49	.015
MBI_PE	.00	.073	51	.200[*]
	1.00	.099	49	.200[*]
MBI_CY	.00	.091	51	.200[*]
	1.00	.115	49	.110
DASS_D	.00	.127	51	.038
	1.00	.203	49	.000
DASS_A	.00	.205	51	.000
	1.00	.252	49	.000
DASS_S	.00	.082	51	.200[*]
	1.00	.139	49	.019
DASS_TOT	.00	.135	51	.021
	1.00	.183	49	.000
WEMWBS	.00	.139	51	.016
	1.00	.094	49	.200[*]
FMI	.00	.080	51	.200[*]
	1.00	.103	49	.200[*]

* group -0= control; 1 = PMT intervention

Wellbeing = WEMWBS; Resilience =CDRISC10; Mindfulness=FMI;
Exhaustion = MBI_EX; Cynicism=MBI_CY; Personal Efficacy = MBI_PE;
Stress = DASS_S; Depression = DASS_D; Anxiety =DASS_A

2.4 Variable Normality Testing Across Time

		Kolmogorov-Smirnov 4 weeks			12 weeks			26 weeks		
	PMT	Statistic	df	Sig.	Statistic	df	Sig.	Statistic	df	Sig.
CDRISC_4	.00	.097	25	.200*	150	.24	.172	.100	27	.200*
	1.00	.091	23	.200*	.178	23	.056	.113	31	.200*
MBI_EX_4	.00	.149	25	.154	.196	24	.018	.133	27	.200*
	1.00	.115	23	.200*	.124	23	.200*	.081	31	.200*
MBI_PE_4	.00	.097	25	.200*	.161	24	.109	.181	27	.023
	1.00	.143	23	.200*	.151	23	.188	.110	31	.200*
MBI_CY_4	.00	.115	25	.200*	.111	24	.200*	.130	27	.200*
	1.00	.213	23	.008	.163	23	.117	.160	31	.041
DASS_D_4	.00	.180	25	.036	.238	24	.001	.160	27	.073
	1.00	.179	23	.054	.273	23	.000	.226	31	.000
DASS_A_4	.00	.251	25	.000	.313	24	.000	.248	27	.000
	1.00	.282	23	.000	.292	23	.000	.236	31	.000
DASS_S_4	.00	.128	25	.200*	.177	24	.051	.148	27	.136
	1.00	.152	23	.180	.176	23	.062	.133	31	.172
DASS_TOT_4	.00	.150	25	.152	.209	24	.008	.132	27	.200*
	1.00	.197	23	.022	.213	23	.008	.129	31	.200*
WEMWBS_4	.00	.065	25	.200*	.192	24	.022	.121	27	.200*
	1.00	.170	23	.082	.072	23	.200*	.140	31	.127
FMI_4	.00	.147	25	.168	.117	24	.200*	.146	27	.143
	1.00	.177	23	.059	.160	23	.129	.089	31	.200*

Wellbeing = WEMWBS; Resilience =CDRISC10; Mindfulness=FMI; Exhaustion = MBI_EX; Cynicism=MBI_CY; Personal Efficacy = MBI_PE; Stress = DASS_S; Depression = DASS_D; Anxiety =DASS_A. Highlighted showing non normal distribution

Control Group DASS variables showing skew and kurtosis

	DASS_D_4	DASS_A_4	DASS_S_4	DASS_TOT_4	DASS_D_12	DASS_A_12	DASS_S_12	DASS_TOT_12	DASS_D_26	DASS_A_26	DASS_S_26	DASS_TOT_26
N Valid	25	26	26	25	27	27	27	27	28	28	27	27
Missing	26	25	25	26	24	24	24	24	23	23	24	24
Mean	8.9600	4.2308	13.0769	26.8000	6.6667	3.7778	11.3333	21.7778	6.8571	3.7857	10.8889	21.7778
Std. Error of Mean	1.43815	1.20168	1.50171	3.65148	1.38778	1.11623	1.74761	3.88926	1.14286	1.05077	1.46111	3.36960
Std. Deviation	7.19073	6.12737	7.65727	18.25742	7.21110	5.80009	9.08083	20.20916	6.04743	5.56016	7.59217	17.50897
Variance	51.707	37.545	58.634	333.333	52.000	33.641	82.462	408.410	36.571	30.915	57.641	306.564
Skewness	.731	2.540	.820	1.618	1.967	2.265	1.052	1.942	1.218	3.260	1.068	2.084
Std. Error of Skewness	.464	.456	.456	.464	.448	.448	.448	.448	.441	.441	.448	.448
Kurtosis	-.300	8.418	.880	4.197	4.300	5.221	1.017	4.141	2.225	13.486	1.723	7.023
Std. Error of Kurtosis	.902	.887	.887	.902	.872	.872	.872	.872	.858	.858	.872	.872

a. PMT = .00

Wellbeing = WEMWBS; Resilience =CDRISC10; Mindfulness=FMI; Exhaustion = MBI_EX; Cynicism=MBI_CY; Personal Efficacy = MBI_PE; Stress = DASS_S; Depression = DASS_D; Anxiety =DASS_A

Intervention Group DASS variable statistics showing skew and kurtosos

	DASS_D_4	DASS_A_4	DASS_S_4	DASS_TOT_4	DASS_D_12	DASS_A_12	DASS_S_12	DASS_TOT_12	DASS_D_26	DASS_A_26	DASS_S_26	DASS_TOT_26
N Valid	24	24	24	24	24	24	25	24	31	31	31	31
Missing	25	25	25	25	25	25	24	25	18	18	18	18
Mean	7.6667	5.5833	11.8333	25.0833	4.9167	4.0000	10.9600	20.0000	6.2581	3.8065	9.6129	19.6774
Std. Error of Mean	1.41763	1.71515	1.82938	4.39199	1.17941	1.46456	1.70927	3.69685	1.17589	.95199	1.35176	2.84223
Std. Deviation	6.94492	8.40247	8.96208	21.51626	5.77789	7.17484	8.54634	18.11077	6.54710	5.30044	7.52630	15.82485
Variance	48.232	70.601	80.319	462.949	33.384	51.478	73.040	328.000	42.865	28.095	56.645	250.426
Skewness	1.009	2.070	.765	1.281	1.563	2.601	1.217	1.278	1.322	2.684	.771	.716
Std. Error of Skewness	.472	.472	.472	.472	.472	.472	.464	.472	.421	.421	.421	.421
Kurtosis	.567	4.656	-.211	.993	1.679	7.303	1.278	1.126	1.531	9.670	-.031	-.275
Std. Error of Kurtosis	.918	.918	.918	.918	.918	.918	.902	.918	.821	.821	.821	.821

a. PMT = 1.00

Wellbeing = WEMWBS; Resilience =CDRISC10; Mindfulness=FMI; Exhaustion = MBI_EX; Cynicism=MBI_CY; Personal Efficacy = MBI_PE; Stress = DASS_S; Depression = DASS_D; Anxiety =DASS_A

2.5 Engagement with Conditions

Normality test with engagement variables (sumtracks and Sum CD1 in both groups)

	PMT	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
sumtracks	.00	.165	32	.027
	1.00	.168	29	.036
sum_CD1	.00	.106	32	.200[*]
	1.00	.086	29	.200[*]

3 Appendix for Study 2 Methods

3.1 Letter of ethical approval from Lothian NHS

Lothian NHS Board

Lothian Research Ethics Committee 02
Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Telephone 0131 536 9000
Fax 0131 536
www.nhslothian.scot.nhs.uk

NHS
Lothian

Ms Sheila Ross
PhD student
self employed
24 Boswall Road
Edinburgh
EH5 3RN

Date   16 February 2009
Our Ref
Enquiries to Lyndsay Baird
Extension   89061
Direct Line 0131 536 9061
Email lyndsay.baird@nhslothian.scot.nhs.uk

Dear Ms Ross

Full title of study: An evaluation of the impact of a positive mental training programme on the mental health and wellbeing of a working population.

REC reference number: 08/S1102/64

Thank you for your letter of 08 January 2009, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered at the meeting of the Committee held on 11 February 2009. A list of the members who were present at the meeting is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission at NHS sites ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Headquarters
Deaconess House 148 Pleasance Edinburgh EH8 9RS
Chair Charles J Winstanley
Chief Executive James Barbour O.B.E.
Lothian NHS Board is the common name of Lothian Health Board

INVESTOR IN PEOPLE

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3.2 Minutes from Department of Clinical Psychology Ethics Meeting, Edinburgh University

DClinPsychol Ethics Meeting

4th August 2008

Present
Emily Newman
Suzanne O'Rourke
Jill Jones
Lindsey Murray
Eleanor Sutton
Paul Morris *
*Paul attended for Sheila Ross and Evelyn Janetta proposals to clarify any issues as supervisor.

Apologies
Ken Laidlaw
Mick Power

Sheila Ross
This is a PhD project supervised by Paul and David.
The panel had one main concern about the project, which was the commercial interest that the researcher has in the project and evaluation of the training. There was a discussion of whether this is appropriate for a PhD. However, the panel recommended that Sheila tries to be as transparent as possible and think about the following:

- She employs someone else to conduct the interviews.
  The extent to which someone else can analyse the interviews was debated, but the greater involvement of another in the analysis of the first interviews would be good. At the least someone else should compare codings.
- There was a discussion over how to phrase the part about use of results in training and promotion on the consent form. We were unsure whether this was group results or quotations from the qualitative study. It was suggested that a separate consent form exists for the qualitative study; otherwise she is in danger of losing participants who do not agree to this. For the quantitative study she could add to the statement on the consent form that presentations will include those for promotion of the product. The qualitative consent form should have a specific statement about the use of quotations.

  Other issues included:
- There may be a difference in commitment (engagement) between the intervention groups and she will need to be aware of this. This may be compounded by the information provided on the information sheets, which specifies the two conditions. The panel felt that she could make it less obvious which was the intervention and which the control in her descriptions. She should also relabel the CDs with 'A' and 'B' or '1' and '2' rather than print the name of the training. If participants are not made blind to conditions she needs to make sure that she does not state this is blind in the method/ethics applications.
- It would also increase researcher blindness if someone else had control over data return, participant ID and condition.

- There was concern over the use of HADS in a non-clinical sample. The use of the DASS was recommended, to include a measure of physical symptoms.

- It was a bit unclear why occupational health need to be familiar with the scale used. It needs to be made clear that they cannot identify or contact any individuals from the study.

- What is the clinician version of the HADS? Did she mean the self-report version?

- The panel raised concerns that this would not be enough work for a PhD.

The project does not need to return to the panel provided that ethical issues are addressed.

3.3 Information sheet for research participants for Interview

Promoting mental health and wellbeing in a working population

Thank you for taking part in the above research project. Your participation has been very helpful. To help us understand more fully your experience of listening to the relaxation training programme we would like to invite you for an individual interview where you will be asked to talk about *your* views and experiences of using the audio programme**.**

Before you decide you need to understand why these research interviews are being done and what would be involved from you. Please take time to read the following information carefully. Talk to others about the interviews if you wish.   Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

About the Interviews

The purpose of the interviews is to get a more in-depth understanding of personal experiences of using the relaxation training programme and any effects it may have had. Sometimes its easier to understand something through talking to someone than from the answers in questionnaires. Questionnaires are useful and give us information that can be counted but listening to someone gives us a different kind of information which can be very helpful. The interview is very relaxed and informal and will be conducted by an experience, independent, female researcher.

The interviews will be analysed as part of the research which is being carried out as part of a PhD in the University of Edinburgh, Health in Social Science Dept. in conjunction with NHS National Services Scotland (NHS NSS).

Who is being invited to take part in this study?

Some people who listened to either the verbal relaxation training programme or the music relaxation training programme are being invited for interview. They have been randomly chosen to represent those who completed the programme, those who did not complete the programme and men and women.

It is up to you to decide if you wish to take part. If you do we will ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time, without giving a reason. This will not affect your work record in any way.

What you are expected to do

If you decide to take part please phone or email the researcher on (work no, email inserted here)

You will be given an appointment time to attend for interview at a mutually convenient time during work hours and this will last about 45 mins.

The interview will be audio recorded so we can remember what you said and will be strictly confidential and available only to the researcher and relevant staff from the NHS or university. All will have a duty of confidentiality to you as a research participant and will do their best to meet this duty. These recordings will be stored in a safe place, under lock and key in the Occupational Health Department, until the PhD is finished and they will then be destroyed.

By signing the consent form you are agreeing to participate in this research study, which involves attending for an interview to discuss your experiences of listening to the CDs.

If you have any queries or want to discuss this further you can contact the research team on (work number, email inserted here)

Thank you.   Sheila Ross

3.4 Curriculum vitae of Mrs Tish Chalmers, independent interviewer

Patricia (Tish) Chalmers
Health & Social Researcher
19 Viewfield Road
Juniper Green
Edinburgh
EH14 5BE
0131 453 3463
Mobile: 07795552905
tishchalmers@tc-research.co.uk

WORK HISTORY

Jan 2008	**Freelance social researcher** Collaboration with the Centre for the Older Person's Agenda, Queen Margaret University, Edinburgh regarding undertaking research to examine 'The Pathway from Hospital to Care Home'. Update of previous literature review.
March 2007	**Freelance social researcher** **Scottish Partnership for Palliative Care** Editorial consultant for the Scottish Partnership for Palliative Care helping to produce a publication on heart failure and palliative care. This work was commissioned by the British Heart Foundation Scotland.
Jan 2007	**Freelance social researcher** **Scottish Centre for Social Research** Collaboration with the ScotCen evaluating a National Pilot of Standards and Listing in Three NHS Boards. This pilot aimed to introduce the regulation of health care support workers (HCSW) by the achievement of standards and to maintain a central list of all those who were successful in achieving the standards. A mixed method approach included in depth interviews with stakeholders and key informants; surveys of HCSWs and work place supervisors and accessing anonymised data from the List of those registered. The evaluation was commissioned by the Scottish Executive Health Department. I was involved with the preparation and undertaking of the in depth interviews and some analysis.
Feb 2006/Dec 2006	**Freelance social researcher** **Scottish Centre for Social Research** Evaluation of legislation to prohibit smoking in enclosed public places. In depth interviewing of identified stakeholders pre and post ban
Sept – Nov 2006	**Freelance social researcher** **Center for the Older Person's Agenda, Queen Margaret University College, Edinburgh** Literature review: The Pathway from Hospital to a Care Home Environment

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3.5 CONSENT FORM for Interviews

Title of Project: Promoting mental health and wellbeing in a working population.

Name of Researcher: Sheila Ross

Participant ID number _____

Please initial box

1. I confirm that I have read and understand the information sheet dated....................
 for the above study. I have had the opportunity to consider the information, ask questions
and have had these answered satisfactorily.   ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time
without giving any reason, without my medical care, work record or legal rights being affected.   ☐

3. I understand that data collected during the study may be looked at by relevant individuals from
Edinburgh University or from the NHS. I give permission for these individuals to have access to my data.   ☐

4. I understand that results from the study will be published as a university thesis and will be published in
academic journals / presentations. All such results will have any identifying information removed, such that
individual participants could not be readily identified from the results.   ☐

5. I agree to be audio recorded during interview   ☐

6 . I agree to take part in the above study. .   ☐

_____ _____ _____
Name of Participant   Date   Signature

_____ _____ _____

Name of Person   Date   Signature
taking consent

<u>Optional</u>
I am willing for anonymised quotes from my interview to be used in the results from this study
provided all identifying information will be removed, and that I cannot be readily identified from these ☐
quotes.
_____ _____ _____
Name of Participant   Date   Signature

When completed, 1 for participant; 1 (original) for researcher site file

3.6 Interview Schedule

1 Perhaps if you could begin with you telling me a bit about yourself

......where do you work and is it full time, etc..?

2 Can you tell me a bit about how you have found listening to the programme? Your experience of using the programme?

- can you tell me more about that?

3 Can you remember last time you listened, can you describe it to me?

- what was it like?

4 What do you think you, or maybe other people, have noticed about yourself since you have been listening to the programme?

- can you give specific examples?

5 What do you think could be changed about the programme?

6 Anything else you'd like to add before we finish?

3.7 Additional questions from emergent themes

The interview schedule was modified and an additional questions were added into the interview schedule to 'check out' one theme, that of 'fitting into their life, i.e. fitting into their own experiences and understandings of the world'.

Instructions to Interviewer
It would be helpful if you could follow up/ incorporate, the following ideas in interviews if possible
1   when you are exploring motivation for using the programme –

a   it seems that it may come from previous experience from other self help such as Alexander technique and Chi Gong, so if it's not forthcoming can you ask if they have done any other self help/ alternative therapies
b   also may come from previous experience of stressful events – could you ask '*what is it in their experience (of stress) which prompts this response, ie to try this*

programme?' I am wondering if its a desire to cope better or a desire to avoid. Hopefully you won't get into the detail of their past stress, we don't really need to know that, just what about that experience motivates them to try the programme.

2   listening – perhaps ask '*how easy has it been to fit listening to the CDs into your routine/your life?*' I am thinking that it needs to be able to fit into their lives to be easily acceptable (perhaps this sounds obvious!)

4 Appendix for Study 2 Results

4.1 Example of Nvivo screen shot showing coding of a participant interview

4.2 Screenshot of Nvivo showing coding and theme development

4.3 Screen shot of Nvivo thematic development

Nodes compared by number of items coded

4.4 Sheet showing manual coding and thematic development

4.5 Sample sheets showing development of themes and categories

emotional response

not harmonious relaxing

increase stress to fit in

music

busy — break in routine   MRT

what others think

no support / need to make sense of it?
unsure of what to do
eg falling asleep   MRT much harder to engage with

too tired →   not listening ⟷ Waiting ideal time   ∴ try to unlisten

limited self belief

no obvious benefit

ie always — doesn't work

not enjoying / like

I'm like that like other cause

duty chore

not following instruction

MRT — did she listen — yes ?

see
stress as external
ie no internal loci of control

not give tools to help change
— this as MRT @ others

Beliefs — open to try
— limiting factors — like before
expectations?
make sense of (only MRT?).

↓ taking personal responsibility

recognise fitly into life

say to follow / opposite unsure

short time

free   anonymous   need reassurance guidance

sense of compulsion

te help self — to help research

Listening ⟵ open minded

headphones

routine T

coerced

benefits
— relaxing   came v. quickly with
— sleep   VRT / not MRT

previous experience
interested in alternatives

determined
sense of day what set out to do — to comply / help — self — researcher

— fitly into life.

Time — short listening
— at the right time for me
— making time to listen

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5 Appendix for Study 3 Methods

5.1 University of Edinburgh Ethical Approval

<div align="center">Boswall Road, Edinburgh EH5 3RN</div>

School of Health in Social Science
Medical School, Teviot Place
Edinburgh EH8 9AG

17th April 2011

Dear Dr Quale,
Re: Sheila Ross Research Ethics application.

Thank you for your letter of the 4th April expressing the concerns of the ethics committee. I have now addressed these and detail this under each bullet point raised. I am also attaching with the email with this letter, the modified research proposal for resubmission. Modifications have been highlighted (italics). I hope these satisfactorily meet the requirements for ethical approval.

- The applicant needs to state, in advance, whether there are 2 groups or 3 groups, and PMT needs to be adequately referenced and described.
    - *The design has been modified so that there are 3 groups (2 experimental conditions and a control), see pages 1, 7, 13.*
    - *PMT referenced (page 2) and described more fully in appendix, page 33 .*
- If it is a non-clinical sample why are there hypotheses about participants with high social anxiety? The mood induction procedure produces short lasting effects on mood not anxiety.
    - *Following previous researchers, who have used this social anxiety scale to isolate, from within healthy volunteer participants, cohorts of high and low socially anxious participants, (Tsunoda et al., 2008), participant data will be split into top and bottom percentiles of the social anxiety scale (SPIN). These cohorts can then be statistically compared, as it is argued (see page 4) that those participants with higher social anxiety ratings will be more sensitive to the hypnosis intervention condition. Adopting this analogue research design is recognized as a useful strategy for experimental designs that would otherwise require substantial sample sizes (Stopa and Clark, 2001) (page 4).).*
    - *The mood induction procedure is to stress the participants to assess the ability of the intervention conditions to protect against stress (ie low mood induction), as measured by positive mood (not anxiety). This is a test of resilience. Statistical analysis will be carried out on the whole sample as well as the SPIN cohorts.*

- P6 the description of interventions conditions needs to make reference to when the negative mood induction is introduced.
  - *The timing of the negative mood induction is schematically shown on the flowchart, see page 14, and described in the text on page 19.*
- There needs to be a decision to use a control group based on science rather than convenience and ethics cannot be granted until that has been taken account of.
  - *Addressed as in first bullet point*
- How do we know that the negative mood induction has 'worked'? This is important and has implications for interpreting the results. Needs clarification.
  - *The negative subscale of the PANAS is being used for this and is included in the flowchart (see page 14). This follows previous researchers protocol who have used the same mood induction procedure and check with PANAS (see page 19).*
- The experimenter is not blinded to the experimental condition. This requires further consideration.
  - *The experimenter will be blinded to experimental condition, see pages 3 &13.*
- 'Participants will be induced with a small monetary reward' (p 13) – please remove the word 'induced'.
  - *Replaced with 'will be given', see page 13.*
- The participant information sheet seems too brief and there is no mention of what a participant should do if their mood does not return to normative levels. There should also be a contact person other than the researcher who the participant can contact to discuss the study and ideally this should not be the supervisors.
  - *The participant information sheet suggests that if a participant's mood does not return to normative levels he/she can contact the university's counselling service, (see page 15).*
  - *The information sheet has been lengthened (page 15) and covers the suggested inclusions in the NRES (National Research Ethics Service) guidelines.*

- I recommend that student resubmit ethics application in light of above changes. As the experimenter is biased and is not blinded to the experimental conditions, I strongly recommend a modification to the methodology to remove this bias.
  - *The methodology has been modified to address these concerns, as detailed above.*

Yours sincerely,

Sheila Ross
PhD Student
Dept. Health & Clinical Psychology

5.2 Participant Information Letter

Title of Project: An investigation into suggestion and mood

Name of Researcher: Sheila Ross

Dear Student,

I would like to ask you to read this letter and consider participating in my study, please do not hesitate to contact me if you have any queries.

The purpose of this study is to investigate the effects of suggestion on mood. The study will last no longer than 60 mins and consists of a simple word order task, some short mood questionnaires, and listening to a recorded audio track. In addition you will also watch a short sad video clip (3mins), and a short funny video clip.

You cannot participate if you are on medication which may affect your mood, eg anti-depressants or betablockers. No risks are anticipated regarding your participation in this study. However, in the event that you do experience some distress as a result of participation in this study, please note that counselling services are available to Edinburgh University students (Tel.: 0131 650 4170).

The study is being carried out as part of a PhD in Health Psychology.

All the information you provide will be kept confidential. All of the data will be summarized and no individual could be identified from these summarized results. The data collected from this study will be accessed only by the researchers named below and will be kept secure in a locked filing cabinet and/or on a secure server. The data will be electronically archived after completion of the study and maintained indefinitely after the research study has been completed and any submissions to journals have been completed. The anticipated benefit to you is that you may learn more about how research in social psychology is conducted and may experience this first hand.

In appreciation of your time, you will receive £6 in exchange of your participation . Participation in this study is voluntary, and you may withdraw from the study at any time by informing the experimenter.

You will be offered the opportunity to receive a report of the finished study.

You will be asked to sign a consent form when you come to participate.

<div align="center">Thank you for your collaboration!</div>

<div align="center">Sheila Ross</div>

<div align="center">Email: S.Ross-14@sms.ed.ac.uk</div>

5.3 Condition Scripts

Script for the Relaxation plus self-confidence condition- Heightened Suggestion (HS) Words 1314

Sit or lie down and make yourself as comfortable as possible. In a moment I'll ask you to clench your left hand as hard as you can, take in a deep breath and hold it notice that when you do this the tension in your body especially in your chest and in your left hand and forearm will increase. I will then ask you to breathe out, close your eyes, and relax your left hand and you'll notice when you do that how the relaxation spreads to every part of your entire body and how relaxed your whole body feels. You can begin now by clenching your left hand as hard as you can, take a deep breath as deep as possible and hold your breath hold your breath notice the tensing in your left hand and chest and breathe out, allowing your eyes to close

and relaxing your left hand and your entire body feel how the relaxation spreads throughout your entire body you don't need to make any effort to spread the relaxation just let it come in its own way, breathe calmly and evenly. Concentrate effortlessly on the physical sensations of breathing, the feeling of stretching as you breathe in, and relaxation as you breathe out as you breathe in follow your breath in, as you breathe out follow your breath out, as you breathe in you are aware of your body, as you breathe out you are calming your body, follow your breath in and follow your breath out, noticing that every time you breathe out you relax more and more, deeper and deeper. Now just continue breathing calmly and evenly for a few moments until I speak to you again each time that you breathe out allow yourself to relax even more, allow the relaxation to spread throughout your entire body at its own speed, noticing the pleasurable sensation of heaviness that follows the relaxation. As you continue paying attention to your breathing in this way, following the sound of your breathing, its natural to find that your mind floats away, so that the everyday sounds around you become more remote as if fading away into the distance. You are able to focus on my voice while all other outside sounds drift away. And you listen to my voice in this way you become more and more relaxed. Notice how your toes and feet feel heavy and relaxed and let that relaxation spread up your body, so that all your leg muscles are heavy and relaxed. Let the feeling spread to your back, your shoulders, down your arms and hands, all the way to your fingers. Now Take your attention to your neck and head, allowing them to relax, notice your face and all the muscles in your face, soft and smooth, relax your forehead, your eyelids, your jaw, so that your tongue is gently resting on the floor of your mouth, your lips gently apart, so that your whole mouth , cheeks and face are comfortable and relaxed. Every muscle in your face is calm and relaxed. And as you become more and more relaxed so your mind becomes more and more relaxed, allowing any thoughts to drift by, noticing them pass and drift away. Feeling calm, relaxed, safe and secure. Recognise that you have reached a place that is very special to you that feels good to you, each time you breathe out let it take you down to a calm beautiful and restful place.

I'm going to give you a few pictures and suggestions that will help you increase your self confidence, that will help you look at yourself in a more positive way, that will help you to value yourself even more than you already do, that will help you respect yourself more, that will help you to have an even better feeling when you think about yourself . These suggestions and pictures that you receive while you are in this state are going to build up your self image, increase your self confidence, and increase your good feelings about yourself. These pictures and suggestions that you receive will affect the way you think, the way that you feel and the way that you act, they'll change your attitude to yourself and you'll see yourself in a more positive way. Afterwards you'll notice each and every change that is positive and this will make you happy. As you continue to listen to this CD these suggestions and visualisations will sink deeply into your unconscious mind and will remain there and will give you increased energy, you'll feel more alert, energetic, able to do more, you'll be more effective and resourceful, you'll be able to take the initiative and be more able to accomplish whatever task you set for yourself, You'll find that your nerves are stronger, that you're emotionally stronger, and that you'll feel more stable, your thoughts will be calmer and clearer, more controlled, more collected and balanced, more filled with satisfaction, and you'll have an easier and easier time focusing and concentrating and paying attention to whatever it is you're doing at that moment, you'll be able to detach your thoughts from issues that are at that moment irrelevant, and you'll have an increased ability to keep concentration and focus in the midst of disturbances. You'll be able to see things exactly the way they are without making difficulties seem larger than they really are, and without losing your sense of perspective. You'll also be able to look at things that happen in a more positive way. You'll discover that there's something

positive to be found in everything that happens you'll find that you can never ever fail and you'll be able to learn from your mistakes, you'll experience that you'll grow as a result of difficulties, you'll experience problems as solutions, hindrances as challenges, this means that you'll be able to face the future with a deep feeling of calm assurance and self confidence. You'll be able to look at coming events with a feeling of confidence and positive expectation, you'll be able to stand up for yourself more, You will realise that you too have the right to become angry that you too have the right to be sad, you will realise that your feelings are as important as those of other people. You will more easily express your own ideas, you will realise that your ideas are as important as those of other people, that you are as important a person as anyone else. Every day you will experience an increase of inner safety, inner security, and personal well being, you will become more aware of your resources and your potential, day by day your trust in your own abilities will increase, day by day your feeling of safety and inner security will grow, day by day your self-esteem, your self respect and your self confidence will steadily develop. You'll experience that your picture of yourself and your personal resources will grow more and more and become more and more positive.

Allow yourself to picture yourself in some future situation and see how your increased self confidence enables you to handle this situation better than you ever have before. Allow yourself now to move into this situation and experience how much better you manage it than you ever have before. With the help of this training your overall picture of yourself will become more and more positive, You'll experience how your self confidence and your good feelings about yourself will simply grow and grow as each day goes by.

When you open your eyes, you'll know that the suggestions that you've just received will rest with you and will affect the way of thinking and feeling and acting that you now have at your command. So go ahead now and open your eyes and continue with the next task.

Script for self confidence suggestion only condition (SO) - Words 1315

Sit or lie down and make yourself as comfortable as possible and allow your eyes to close your eyes. I'm going to give you a few pictures and suggestions that will help you increase your self confidence, that will help you look at yourself in a more positive way, that will help you to value yourself even more than you already do, that will help you respect yourself more, that will help you to have an even better feeling when you think about yourself. These suggestions and pictures that you receive while you are in this state are going to build up you're self image, increase your self confidence, and increase your good feelings about yourself. These pictures and suggestions that you receive will affect the way you think, the way that you feel and the way that you act, they'll change your attitude to yourself and you'll see yourself in a more positive way. Afterwards you'll notice each and every change that is positive and this will make you happy. As you continue to listen to this CD these suggestions and visualisations will sink deeply into your unconscious mind and will remain there and will give you increased energy, you'll feel more alert, energetic, able to do more, you'll be more effective and resourceful, you'll be able to take the initiative and be more able to accomplish whatever task you set for yourself, You'll find that your nerves are stronger, that you're emotionally stronger, and that you'll feel more stable, your thoughts will be calmer and clearer, more controlled, more collected and balanced, more filled with satisfaction, and you'll have an easier and easier time focusing and concentrating and paying attention to whatever it is you're doing at that moment, you'll be able to detach your thoughts from issues that are at that moment irrelevant, and you'll have an increased ability to keep concentration and focus in the midst of disturbances. You'll be able to see things exactly the way they are without making difficulties seem larger than they really are, and without losing your sense of perspective. You'll also be

able to look at things that happen in a more positive way. You'll discover that there's something positive to be found in everything that happens you'll find that you can never ever fail and you'll be able to learn from your mistakes, you'll experience that you'll grow as a result of difficulties, you'll experience problems as solutions, hindrances as challenges, this means that you'll be able to face the future with a deep feeling of calm assurance and self confidence. You'll be able to look at coming events with a feeling of confidence and positive expectation, you'll be able to stand up for yourself more, You will realise that you too have the right to become angry that you too have the right to be sad, you will realise that your feelings are as important as those of other people. You will more easily express your own ideas, you will realise that your ideas are as important as those of other people, that you are as important a person as anyone else. Every day you will experience an increase of inner safety, inner security, and personal well being, you will become more aware of your resources and your potential, day by day your trust in your own abilities will increase, day by day your feeling of safety and inner security will grow, day by day your self-esteem, your self respect and your self confidence will steadily develop. You'll experience that your picture of yourself and your personal resources will grow more and more and become more and more positive. These pictures and suggestions that you receive will affect the way you think, the way that you feel and the way that you act, they'll change your attitude to yourself and you'll see yourself in a more positive way. Afterwards you'll notice each and every change that is positive and this will make you happy.

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day by day your self-esteem, your self respect and your self confidence will steadily develop. You'll experience that your picture of yourself and your personal resources will grow more and more and become more and more positive.

Allow yourself to picture yourself in some future situation and see how your increased self confidence enables you to handle this situation better than you ever have before. Allow yourself now to move into this situation and experience how much better you manage it than you ever have before. With the help of this training your overall picture of yourself will become more and more positive, You'll experience how your self confidence and your good feelings about yourself will simply grow and grow as each day goes by. When you / open your eyes, , you'll know that the suggestions that you've just received will rest with you and will affect the way of thinking and feeling and acting that you now have at your command.

So go ahead now and open your eyes and continue with the next task.

Script for Control Condition - Words 1303

Sit or lie down and make yourself as comfortable as possible and allow your eyes to close. I'm going to tell you about Scotland's weather. Scotland has one of the most varied climates on the planet. It is surprisingly temperate for its latitude and is free from any extreme conditions. In Scotland it is normal to experience both blazing sunshine and rain all in one morning, thanks to being in the path of several major weather systems. Scotland is on the same latitude as Edmonton in Canada, Stockholm in Sweden and even the southern tip of Greenland – but is warmed by the thermal ocean currents of the Gulf Stream from the Gulf of Mexico. During summertime, Scotland's long daylight hours and pleasant temperatures are a great advantage to everyone - especially if you are interested in outdoor activities. Southern and eastern Scotland average some 1400 hours of sunshine per year. The sunniest months are May and June - the country's northern latitude means that the days are long and the nights short - temperatures range from 13 to 16 degrees Celsius. Around midsummer there is no complete darkness in the north of Scotland - the Shetland Islands get about four hours more daylight at this time of year than London. July and August are normally the warmest months with an average temperature of 19 degrees Celsius, although the temperature has been known to top 32 degrees. Scotland's rainfall is the subject of much debate. The prevailing climate in Scotland has provided the countryside with lush green pastures all year round. Another benefit of the weather is the continual supply of fresh water, meaning no droughts or water rationing that has affected many parts of the UK in recent years. Little-known facts about Scotland's rainfall are that, during the four summer months, rainfall in Scotland is comparable with the driest parts of England. Scotland's rainfall depends on the area as much as the season - in general, the east coast is cooler and drier than the west, which is milder and wetter. Many of Scotland's east coast towns have less annual rainfall than Rome. Rainfall in Scotland doesn't result in flooding and riverbank bursting - which can be common in parts of England and Wales. There are only a handful of thunderstorms every year. Scotland's weather systems generate its hydro-electric industry - an extremely environmentally friendly form of energy. While the wind generally blows from the south west it can frequently be very windy on the north-west and gales can be quite common. But apart from the very rare storm there is no real threat of hurricanes or tornadoes. However the wind has become one of Scotland's greatest assets making the country an excellent location for sailing, windsurfing and surfing - not to mention windfarms. January and February are the coldest months with maximum temperatures over low ground averaging 5 to 7 degrees Celsius. On rare occasions, temperatures have been known to reach 15 degrees when a moist south or south-westerly

airflow warms up after crossing the mountains. Frosts are common in winter, however Scotland does not endure severe winters and heavy snow. Snow rarely lies at sea level before November or after April. Snowfall increases considerably with height - Scotland's winter sports resorts are all found in the Highlands. Scotland is free from the destructive effects of natural phenomena such as earthquakes and volcanoes. Although the country lies on natural fault lines, seismic activity is extremely limited with just the occasional tremor that shakes tea in cups but nothing else. Scotland is full of extinct volcanoes, indeed Edinburgh is built upon them, but there has been no volcanic activity since the Tertiary period - some 50 million years ago.

*And now I'm going to tell you about Edinburgh University. The **University of Edinburgh**, founded in 1583,. The University is deeply embedded in the fabric of the city, with many of the buildings in the historic Old Town belonging to the University.[4] It was the fourth university to be established in Scotland. The founding of the University is attributed to Bishop Robert Reid of St Magnus Cathedral, Kirkwall, Orkney, who left the funds on his death in 1558 that ultimately provided the University's endowment. The University was established by a Royal Charter granted by James VI in 1582. This was an unusual move at the time, as most universities were established through Papal bulls. That is an official document issued by the Pope of the Catholic Church. It is named after the bulla that was appended to the end in order to authenticate it. Originally the University of Edinburgh did not enjoy a custom-built campus and existed in a hotchpotch of buildings until the early 19th Century. The University's first custom-built building was the magnificent Old College, , situated on South Bridge. Old college was built to plans by Robert Adam, by the architect William Henry Playfair. Old College was first used for teaching anatomy and the developing science of surgery, From the basement of a nearby house ran the anatomy tunnel corridor. It went under what was then North College Street, now Chambers Street, and under the University buildings until it reached the University's anatomy lecture theatre, delivering bodies for dissection. It was from this tunnel that the body of William Burke was taken after he had been hanged. Since then teaching at Old College has expanded into many other subjects and Old College is now the School of Law. Towards the end of the 19th century, Old College was becoming overcrowded and so Robert Anderson was commissioned to design new Medical School premises in 1875. The medical school was more or less built to his design and was completed by the addition of the McEwan Hall in the 1880s. The building now known as New College was originally built as a Free Church college in the 1840s and has been the home of Divinity at the University since the 1920s. In addition, the University is responsible for a number of historic and modern buildings across the City, including the oldest purpose-built concert hall in Scotland, -, St Cecilia's Concert Hall. St Cecilia's Hall is the second oldest concert hall in use in the British Isles today. Teviot Row House, is another historic building which belongs to the university and is the oldest purpose built Student Union Building in the world. There is also the handsomely restored 17th-century Mylne's Court student residence which stands at the head of Edinburgh's Royal Mile. Edinburgh's Library pre-dates its University by three years. Founded in 1580, its collection has grown to become the largest university library in Scotland with over 2 million periodicals, manuscripts, theses, microforms and printed works. These are housed in Faculty and Departmental Libraries and also in the main University Library building in George Square which is one of the largest academic library buildings in Europe, and was designed by Basil Spence . In 2002 the University was re-organised from its 9 faculties into three 'Colleges'. While technically not a collegiate university, it now comprises the Colleges of Humanities and Social Sciences, Science & Engineering and Medicine & Vet Medicine. Within these Colleges are 'Schools' which are roughly equivalent to the departments they succeeded. This has brought a certain degree of uniformity in terms of administration at least, across the*

University. However, it is notable that individual Schools have a good degree of autonomy regarding their finances and internal organisation. Along similar lines, all teaching is now done over two semesters, rather than 3 terms – bringing the timetables of different Schools into line with one another, and coming in to line with many other large universities,(notably in the US, but to an increasing degree in the UK as well. So go ahead now and open your eyes and continue with the next task.

5.4 Participant Research Booklet

CONSENT FORM

Title of Project: . An investigation into mood and suggestion

Name of Researcher: Sheila Ross

Please initial box

1. I confirm that I have had the opportunity to consider the information about the study ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my student records or legal rights being affected. ☐

3. I understand that data collected during the study may be looked at by relevant individuals from Edinburgh University. I give permission for these individuals to have access to my data. ☐

4. I understand that results from the study will be published as a university thesis, and published in academic ☐ journals / presentations. All such results will have any identifying information removed, such that individual participants could not be readily identified from the results.

5. I agree to take part in the above study. ☐

_____ _____ _____
Name of Participant   Date   Signature

_____ _____ _____

Name of Person   Date   Signature
taking consent

<u>Financial Incentive</u>

6. I acknowledge of receipt of £6 ☐
.

_____ _____ _____
       Date   Signature

Thank you for participating in this experiment.
Please fill in the details below.

Age _____   Gender _____

Nationality _____

STOP

Do not turn the page
Until instructed to do so

A

In this task, you will be asked to unscramble sentences to form statements. Each scrambled sentence contains six words. Unscramble <u>five</u> words in each sentence by placing a number over each of <u>five</u> words showing the order.
For example:

<div align="center">

3   2   1   5   4

has green child the eyes blue

</div>

Unscramble the sentences to form statements, not questions. Each sentence can be unscrambled into more than one statement, but you should choose only one statement to unscramble. Unscramble the sentences to form whatever statement comes to mind first. Work as quickly as you can because your time will be limited. Do not correct errors. If you make a mistake simply move on to the next item.
PRACTICE SENTENCES:
1.   the windy yesterday weather snowy was
2.   some need doesn't she milk does
3.   his horse carefully bike rides he

On the next page are some more sentences for you to unscramble as before. You have 4 minutes to unscramble as many sentences as possible. Work as quickly and as accurately as possible. Do not correct errors. If you make a mistake simply move on to the next item.
Before you start, you will be asked to memorise a number. Try to keep the number in your memory while you unscramble the sentences, as you will be asked to recall it at the end of the test.

apprehensive people with relaxed new I'm

meetings tense relaxed I at feel

can errors cannot social make I

others foolish I to sensible appear

uneasy other with easy I'm people

won't fool will a I look

think worthwhile others worthless I am

I'm people stressed relaxed other with

approaching fine scary people is new

superiors my I please will displease

occasions avoid I social enjoy usually

opinions do me bother others' don't

PLEASE CONTINUE OVER THE PAGE

people usually from withdraw don't I

gatherings dread love usually I social

sizing is up me no-one someone

attend I social avoid usually functions

me good of bad think others

things say wrong right I the

avoid wish people to I meet

occasionally strangers never I with talk

Write the 6 digit number , or as much as you remember, in the box below

Indic

STOP

Do not turn the page
Until instructed to do so

B   This scale consists of a number of words that describe different feelings and emotions. Read each item and then **circle** the appropriate answer next to that word. Indicate to what extent you feel this way at this present moment i.e. **now.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Relaxed	1	2	3	4	5
4. Excited	1	2	3	4	5
5. Upset	1	2	3	4	5
6. Strong	1	2	3	4	5
7. Guilty	1	2	3	4	5
8. Scared	1	2	3	4	5
9. Hostile	1	2	3	4	5
10. Self assured	1	2	3	4	5
11. Confident (satisfied)	1	2	3	4	5
12. Sad	1	2	3	4	5
13. Enthusiastic	1	2	3	4	5
14. Proud	1	2	3	4	5
15. Irritable	1	2	3	4	5
16. Alert	1	2	3	4	5
17. Ashamed	1	2	3	4	5
18. Inspired	1	2	3	4	5
19. Nervous	1	2	3	4	5
20. Depressed	1	2	3	4	5
21. Despondent (hopeless)	1	2	3	4	5
22. Determined	1	2	3	4	5
23. Attentive	1	2	3	4	5
24. Jittery	1	2	3	4	5
25. Active	1	2	3	4	5
26. Discouraged	1	2	3	4	5
27. Afraid	1	2	3	4	5
28. Hopeful (cheerful)	1	2	3	4	5

C   The questionnaire below is designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again answer these questions as they are true for you **RIGHT NOW.**

Please circle a number 0,1,2,3 or 4 to indicate how much you agree with the following statements as they apply to you right now.

		Not at all	A little bit	Somewhat	Very much	Extremely
1	I feel confident about my abilities	0	1	2	3	4
2	I am worried about whether I am regarded as a success or failure	0	1	2	3	4
3	I feel frustrated or rattled about my performance	0	1	2	3	4
4	I feel that I am having trouble understanding things that I read	0	1	2	3	4
5	I feel self-conscious	0	1	2	3	4
6	I feel as smart as others	0	1	2	3	4
7	I feel displeased with myself	0	1	2	3	4
8	I am worried about what other people think of me	0	1	2	3	4
9	I feel confident that I understand things	0	1	2	3	4
10	I feel inferior to others at this moment	0	1	2	3	4
11	I feel concerned about the impression I am making	0	1	2	3	4
12	I feel that I have less scholastic ability right now than others	0	1	2	3	4
13	I feel like I'm not doing well.	0	1	2	3	4
14	I am worried about looking foolish	0	1	2	3	4

D   Please circle a number 0,1,2,3 or 4 to indicate how much you agree with the following

statements as they apply to you.

		Not at all	A little bit	Somewhat	Very much	Extremely
1	I have a fear of people in authority	0	1	2	3	4
2	I am bothered by blushing	0	1	2	3	4
3	I have a fear of parties and social events	0	1	2	3	4
4	I avoid talking to strangers	0	1	2	3	4
5	I have a fear of criticism	0	1	2	3	4
6	I avoid embarrassment	0	1	2	3	4
7	I am distressed by sweating	0	1	2	3	4
8	I avoid parties	0	1	2	3	4
9	I avoid being the centre of attention	0	1	2	3	4
10	I fear talking to strangers	0	1	2	3	4
11	I avoid speeches	0	1	2	3	4
12	I avoid criticism	0	1	2	3	4
13	I am distressed by palpitations	0	1	2	3	4
14	I have a fear of others watching	0	1	2	3	4
15	I have a fear of embarrassment	0	1	2	3	4
16	I avoid talking to authority	0	1	2	3	4
17	I am distressed by trembling or shaking	0	1	2	3	4

E   Please circle a number 0,1,2,3 or 4 to indicate how much you agree with the following
statements as they apply to you over the **last month**.

If a particular situation has not occurred recently, answer according to how you think you
would have felt.

		Not true at all	Rarely true	Some-times true	Often true	True nearly all the time
1	I am able to adapt when change occurs	0	1	2	3	4
2	I can deal with whatever comes my way	0	1	2	3	4
3	I try to see the humorous side of things when I am faced with problems	0	1	2	3	4
4	Having to cope with stress can make me stronger	0	1	2	3	4
5	I tend to bounce back after illness, injury or other hardships	0	1	2	3	4
6	I believe I can achieve my goals, even if there are obstacles	0	1	2	3	4
7	Under pressure, I stay focused and think clearly	0	1	2	3	4
8	I am not easily discouraged by failure	0	1	2	3	4
9	I think of myself as a strong person when dealing with life's challenges and difficulties	0	1	2	3	4
10	I am able to handle unpleasant or painful feelings like sadness, fear and anger	0	1	2	3	4

F Read carefully all statements in each of the groups (A,B,C). Then, choose the statement that best describes how you felt during the **last month.**

Past Failure
0   I do not feel like a failure.
1   I have failed more than I should have.
2   As I look back, I see a lot of failures.
3   I feel I am a total failure as a person.

Self-Dislike
0   I feel the same about myself as ever.
1   I have lost confidence in myself.
2   I am disappointed in myself.
3   I dislike myself.

Pessimism
0   I am not discouraged about my future.
1   I feel more discouraged about my future than I used to be
2   I do not expect things to work out for me.
3   I feel my future is hopeless and will only get worse.

STOP

Do not turn the page
Until instructed to do so

STOP

Do not turn the page
Until instructed to do so

PLEASE CHECK YOUR HEADPHONES
(audio 1)

F   On the next 2 pages are some more sentences for you to unscramble as before. Remember to work as quickly as you can because your time is limited. Do not correct errors. If you make a mistake simply move on to the next item.

Again you will be shown a number to memorise

meeting dislike enjoy new I people

me people approve other of disapprove

me others will won't disapprove of

attributes my will people shortcomings notice

faults notice other merits my people

relaxed meeting people me tense makes

make bad I impression good a

talking people to dislike like I

indifferent I'm others' opinions worried about

occasions I enjoyable find social upsetting

strangers relaxed feel with tense I

me fault won't people other will

people I'm new with confident nervous

uncomfortable company comfortable in I'm others'

are other judging watching people me

engagements usually social endure I enjoy

comfortable circles in anxious social I'm

please must may I people other

careful with am carefree others I

with relaxed tense my I'm superiors

Write the 6 digit number, or as much as you remember, in the box below

```



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STOP

Do not turn the page
Until instructed to do so

G   This scale consists of a number of words that describe different feelings and emotions. Read each item and then **circle** the appropriate answer next to that word. Indicate to what extent you feel this way at this present moment i.e. **now.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1.Interested	1	2	3	4	5
2.Distressed	1	2	3	4	5
3.Relaxed	1	2	3	4	5
4.Excited	1	2	3	4	5
5.Upset	1	2	3	4	5
6.Strong	1	2	3	4	5
7.Guilty	1	2	3	4	5
8.Scared	1	2	3	4	5
9.Hostile	1	2	3	4	5
10. Self assured	1	2	3	4	5
11. Confident (satisfied)	1	2	3	4	5
12. Sad	1	2	3	4	5
13. Enthusiastic	1	2	3	4	5
14. Proud	1	2	3	4	5
15. Irritable	1	2	3	4	5
16. Alert	1	2	3	4	5
17. Ashamed	1	2	3	4	5
18. Inspired	1	2	3	4	5
19. Nervous	1	2	3	4	5
20. Depressed	1	2	3	4	5
21. Despondent (hopeless)	1	2	3	4	5
22. Determined	1	2	3	4	5
23. Attentive	1	2	3	4	5
24. Jittery	1	2	3	4	5
25. Active	1	2	3	4	5
26. Discouraged	1	2	3	4	5
27. Afraid	1	2	3	4	5
28. Hopeful (cheerful)	1	2	3	4	5

H   The questionnaire below is designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again answer these questions as they are true for you **RIGHT NOW.**

Please circle a number 0,1,2,3 or 4 to indicate how much you agree with the following statements as they apply to you right now.

		Not at all	A little bit	Somewhat	Very much	Extremely
1	I feel confident about my abilities	0	1	2	3	4
2	I am worried about whether I am regarded as a success or failure	0	1	2	3	4
3	I feel frustrated or rattled about my performance	0	1	2	3	4
4	I feel that I am having trouble understanding things that I read	0	1	2	3	4
5	I feel self-conscious	0	1	2	3	4
6	I feel as smart as others	0	1	2	3	4
7	I feel displeased with myself	0	1	2	3	4
8	I am worried about what other people think of me	0	1	2	3	4
9	I feel confident that I understand things	0	1	2	3	4
10	I feel inferior to others at this moment	0	1	2	3	4
11	I feel concerned about the impression I am making	0	1	2	3	4
12	I feel that I have less scholastic ability right now than others	0	1	2	3	4
13	I feel like I'm not doing well.	0	1	2	3	4
14	I am worried about looking foolish	0	1	2	3	4

I   Please rate your answer to the questions (relating to when you were listening to the audio recording) on the scale below

5   How much did you find yourself thinking in images i.e. in mental pictures and sensory impressions?

Not at all (1)_____2_____3_____4_____5_____6_____7_____8_____(9)All the time

6   How much did you find yourself verbally analysing the meaning of the words?

Not at all (1)_____2_____3_____4_____5_____6_____7_____8_____(9)All the time

7   How much of the time did you find your mind wandering or daydreaming?

Not at all (1)_____2_____3_____4_____5_____6_____7_____8_____(9)All the time

8   How relaxed did you feel?

Not at all (1)_____2_____3_____4_____5_____6_____7_____8_____(9)All the time

STOP

Do not turn the page
Until instructed to do so

AUDIO 2

Now listen to the following music and rate with a X how much you like each clip on the scale below

Clip 1
Dislike_____ **Like**

Clip 2
Dislike_____ **Like**

Clip 3
Dislike_____ **Like**

Clip 4
Dislike_____ **Like**

K   This scale consists of a number of words that describe different feelings and emotions. Read each item and then **circle** the appropriate answer next to that word. Indicate to what extent you feel this way at this present moment i.e. **now.**

	Very slightly or not at all	A little	**Moderately**	**Quite a bit**	Extremely
1.Interested	1	2	3	4	5
2.Distressed	1	2	3	4	5
3.Relaxed	1	2	3	4	5
4.Excited	1	2	3	4	5
5.Upset	1	2	3	4	5
6.Strong	1	2	3	4	5
7.Guilty	1	2	3	4	5
8.Scared	1	2	3	4	5
9.Hostile	1	2	3	4	5
10. Self assured	1	2	3	4	5
11. Confident (satisfied)	1	2	3	4	5
12. Sad	1	2	3	4	5
13. Enthusiastic	1	2	3	4	5
14. Proud	1	2	3	4	5
15. Irritable	1	2	3	4	5
16. Alert	1	2	3	4	5
17. Ashamed	1	2	3	4	5
18. Inspired	1	2	3	4	5
19. Nervous	1	2	3	4	5
20. Depressed	1	2	3	4	5
21. Despondent (hopeless)	1	2	3	4	5
22. Determined	1	2	3	4	5
23. Attentive	1	2	3	4	5
24. Jittery	1	2	3	4	5
25. Active	1	2	3	4	5
26. Discouraged	1	2	3	4	5
27. Afraid	1	2	3	4	5
28. Hopeful (cheerful)	1	2	3	4	5

STOP

Do not turn the page
Until instructed to do so

(visual 1)

L   This scale consists of a number of words that describe different feelings and emotions. Read each item and then **circle** the appropriate answer next to that word. Indicate to what extent you feel this way at this present moment i.e. **now.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1.Interested	1	2	3	4	5
2.Distressed	1	2	3	4	5
3.Relaxed	1	2	3	4	5
4.Excited	1	2	3	4	5
5.Upset	1	2	3	4	5
6.Strong	1	2	3	4	5
7.Guilty	1	2	3	4	5
8.Scared	1	2	3	4	5
9.Hostile	1	2	3	4	5
10. Self assured	1	2	3	4	5
11. Confident (satisfied)	1	2	3	4	5
12. Sad	1	2	3	4	5
13. Enthusiastic	1	2	3	4	5
14. Proud	1	2	3	4	5
15. Irritable	1	2	3	4	5
16. Alert	1	2	3	4	5
17. Ashamed	1	2	3	4	5
18. Inspired	1	2	3	4	5
19. Nervous	1	2	3	4	5
20. Depressed	1	2	3	4	5
21. Despondent (hopeless)	1	2	3	4	5
22. Determined	1	2	3	4	5
23. Attentive	1	2	3	4	5
24. Jittery	1	2	3	4	5
25. Active	1	2	3	4	5
26. Discouraged	1	2	3	4	5
27. Afraid	1	2	3	4	5
28. Hopeful (cheerful)	1	2	3	4	5

Visual 2

5.5 Powerpoint Presentation – Example of Session A

Phd research session

Session A

Please fill in

Consent form and front sheet

and check your headsets are working

🔊

In this first task, you will be asked to unscramble sentences to form statements. Each scrambled sentence contains six words. Unscramble <u>five</u> words in each sentence by placing a number over each of <u>five</u> words showing the order.

For example:

            3   2   1 5 4

has green child the eyes blue

Unscramble the sentences to form statements, not questions. Each sentence can be unscrambled into more than one statement, but you should choose only one statement to unscramble. Unscramble the sentences to form whatever statement comes to mind first. Work as quickly as you can because your time will be limited. Do not correct errors. If you make a mistake simply move on to the next item. 🔊

• Practice

🔊

720185

T1

Audio Track A: will start next slide
turn on headphones and check

Audio track A

- Instructions for more scrambled sentences

615239

10

T2

Audio 2 starts next track

-check headphones

397

Audio Track 2

T3

Visual 1 starts next slide
check headphones

T4

Thank you!

Please hand in your headphones and research
packs & collect your £6

6 Appendix for Study 3 Results

6.1 Full Baseline characteristics showing Skew and Kurtosis values and z scores.

Group A	SST_1	Positive Affect	Negative Affect	SSES_s	SSES_p	SSES	SPIN	CDRISC	BDI_s
Mean	.33	41.75	20.12	27.96	26.41	54.37	20.00	26.88	1.29
Std. Deviation	.19	9.06	6.59	5.33	5.01	9.31	10.05	6.43	1.41
Skewness	.61	.35	1.62	-1.06	-1.05	-1.05	.28	-.24	.84
Std. Error of Skewness	.32	.32	.32	.32	.32	.32	.32	.32	.32
Kurtosis	.36	-.68	2.47	.77	1.30	.60	-.67	-.41	-.40
Std. Error of Kurtosis	.63	.63	.63	.63	.63	.63	.63	.63	.63
Range	.84	36.00	27.00	24.00	22.00	38.00	41.00	26.00	5.00
Minimum	.00	28.00	14.00	11.00	12.00	30.00	3.00	14.00	.00
Maximum	.84	64.00	41.00	35.00	34.00	68.00	44.00	40.00	5.00
z skew	1.91	1.10	5.06	-3.31	-3.28	-3.28	.88	-.75	2.63
z kurtosis	.57	-1.08	3.92	1.22	2.06	.95	-1.06	-.65	-.63

Group B	SST_1	PA_1	NA_1	SSES_s	SSES_p	SSES	SPIN	CDRISC	BDI_s
Mean	.33	41.19	20.74	25.58	26.40	51.98	21.85	28.25	1.44
Median	.33	41.00	18.00	27.00	27.00	55.00	19.00	29.00	1.00
Std. Deviation	.18	8.92	7.22	6.00	5.09	10.12	11.45	5.11	1.75
Skewness	.30	.27	1.52	-.61	-.26	-.43	.19	-.01	1.56
Std. Error of Skewness	.33	.33	.33	.33	.33	.33	.33	.33	.33
Kurtosis	-.80	-.52	2.12	-.58	-.99	-.78	-1.01	-.76	2.58
Std. Error of Kurtosis	.64	.64	.64	.64	.64	.65	.65	.65	.64
Range	.62	36.00	31.00	23.00	18.00	40.00	44.00	20.00	8.00
Minimum	.06	26.00	14.00	11.00	16.00	27.00	.00	18.00	.00
Maximum	.68	62.00	45.00	34.00	34.00	67.00	44.00	38.00	8.00
z skew	.91	.82	4.56	-1.83	-.79	-1.29	.58	-.03	4.72
z kurtosis	-1.25	-.81	3.31	-.91	-1.55	-1.20	-1.55	-1.17	4.03

Group C	SST_1	PA_1	NA_1	SSES_s	SSES_p	SSES	SPIN	CDRISC	BDI_s
Mean	.34	41.72	19.28	27.06	27.18	54.24	21.22	26.64	1.64
Median	.33	42.00	18.50	28.50	28.00	55.00	19.00	27.50	1.00
Std. Deviation	.17	9.59	5.16	5.74	5.35	9.09	13.00	5.93	1.88
Skewness	.15	.29	1.37	-.76	-.33	-.69	.27	-.28	1.74
Std. Error of Skewness	.38	.34	.34	.34	.34	.34	.34	.34	.34
Kurtosis	-.01	-.58	2.04	.09	1.63	-.27	-1.19	-.40	3.80
Std. Error of Kurtosis	.66	.66	.66	.66	.66	.66	.66	.66	.66
Range	.78	37.00	23.00	24.00	32.00	37.00	45.00	26.00	9.00
Minimum	.00	25.00	14.00	11.00	11.00	32.00	2.00	11.00	.00
Maximum	.78	62.00	37.00	35.00	43.00	69.00	47.00	37.00	9.00
z skew	.39	.86	4.07	-2.24	-.98	-2.05	.79	-.82	5.17
z kurtosis	-.02	-.88	3.08	.14	2.46	-.41	-1.80	-.61	5.74

6.2 Levene's Test of Equality of Error Variances in baseline variables

	F	df1	df2	Sig.
SST_1	.301	2	156	.741
Positive Affect	.066	2	156	.936
Negative Affect	2.079	2	156	.128
SSES social subscale	1.003	2	156	.369
SSES performance subscale	.545	2	156	.581
SSES_1_total	1.178	2	156	.310
Social Anxiety (SPIN)	3.653	2	156	.028
Resilience (CDRISC)	1.247	2	156	.290
Depression (BDI_s)	.467	2	156	.628

SSES –Self-esteem Scale

6.3   Levenes Test Relating to Hypothesis 1

Levenes test for SST time 1 and time 2

	F	df1	df2	Sig.
SST_1	.301	2	156	.741
SST_2	1.568	2	156	.212

b) Levenes test for PA time 1 and time 2

	F	df1	df2	Sig.
Positive Affect Score time 1	.066	2	156	.936
PA_2	.503	2	156	.605

c) Levenes test for NA (windsorised) time 1 and time 2

	F	df1	df2	Sig.
windsorised NA time1	1.657	2	156	.194
windsorised NA2	.516	2	156	.598

6.4   Results of moderator effects

Cognitive Bias Modification & Social Anxiety

There was no significant interaction between cognitive bias response and social anxiety levels $F(1,77) = .491$, $p>.05$; cognitive bias x social anxiety x condition group, $F(2,77)=.053$, $p>.05$, and condition group x social anxiety rating $F(2,77) = 1.08$, $p>.05$ indicating that whether a participant has high or low social anxiety did not make a significant difference to cognitive bias response to the conditions.

Cognitive Bias Modification & Depressive score

There was no significant interaction between condition group and depression high and low scores, $F(2,110) = 2.219$, $p>.05$; cognitive bias response and depression high low scores $F(1,110) = .001$, $p>.05$; or cognitive bias response x depression score x group $F(2,110) = .563$, $p>.05$ indicating that whether a participant has high or low social depression scores did not make a significant difference to cognitive bias response to the conditions.

Cognitive Bias Modification & Resilience

There was no significant interaction effects between condition group x high and low resilience scores $F_{(2,82)}=.191$, $p>.05$; cognitive bias scores at time 1 and time 2 x resilience score $F_{(1,82)}$ -.551, $p>.05$; and cognitive bias change x group x resilience score $F_{(2,82)} =.759$, $p>.05$ indicating that whether a participant has high or low resilience did not make a significant difference to cognitive bias response to the conditions.

Positive Affect & Depression

There was no significant interaction between the high and low depression scores and positive affect response between time 1 and time 2, $F_{(1,110)}=.01$, $p>.05$; nor between positive affect response between time 1 and time 2 and condition and depression levels; $F_{(2,110)} = 1.075$, $p>.05$, indicating that the level of depressive score did not impact about positive affect levels in response to the conditions.

Positive Affect & Social Anxiety

There was no significant interaction between the high low social anxiety scores and positive affect score between time 1 and time 2 , $F_{(1,77)}=.327$, $p>.05$; nor between condition and social anxiety levels and positive affect score from time 1 to time 2, $F_{(2,77)} = .616$, $p>.05$, indicating that the level of social anxiety score did not impact about positive affect levels in response to the conditions.

Positive Affect & Resilience

There interaction between the high low resilience scores and positive affect score between time 1 and time 2 , was approaching significance $F_{(1,82)}=3.53$, $p=.06$. There was no significant interaction between condition and resilience levels and positive affect score from time 1 to time 2, $F_{(2,82)} = 1.005$, $p>.05$, indicating that the level of resilience may have an impact on positive affect levels in response to the conditions as a whole,(and not to individual conditions) .

Self-esteem & Social Anxiety

The hypothesis that highly anxious compared to low anxious would absorb suggestions to a greater degree in the HS group compared to the SO group was not proven, $F(2,77) = 0.812$ $p>.05$ when these two groups were compared in a RM- ANOVA with self-esteem at time 1 and 2 as within subject variables and group and social anxiety (high & low score) as between subject variables. There was also no significant interaction between self-esteem over time 1 and time 2 and social anxiety score, $F(1,77) = .026$, $p>.05$.

Self-esteem performance self-esteem social subgroups were also analysed and there was similarly no significant interaction with these subgroups between time 1 and time 2 and social anxiety score $F(1,77) = .299$, $p>.05$ and $F(1,77) = .132$, $p>.05$ respectfully.

Self-esteem & Depression

There was no significant interaction between depression scores on self-esteem scores from time 1 to time 2, $F(1,110) = .055$, $p>.05$ nor on self-esteem scores, depression and conditions group $F(2,110) =1.01$, $p>.05$.

Self-esteem performance self-esteem social subgroups were also analysed and there was similarly no significant interaction with these subgroups between time 1 and time 2 and depression score $F(1,110) = .004$, $p>.05$ and $F(1,110) = .098$, $p>.05$ respectfully, indicating that self-esteem response was not influenced by depression scores.

Self-esteem & Resilience

There was no significant interaction between resilience scores on self-esteem scores from time 1 to time 2, $F(1,82) = .764$, $p>.05$ nor on self-esteem scores, resilience and conditions group $F(2,82) =.806$, $p>.05$.

Self-esteem performance self-esteem social subgroups were also analysed and there was similarly no significant interaction with the social subgroups between time 1 and time 2 and resilience score $F(1,82) = .581$, $p>.05$ but the interaction between performance self-esteem and resilience was approaching significance and $F(1,82) =$

.3.68, *p*=.06. (The interaction with condition was not significant F (2,82) - .523, *p*>.05.) This indicates that the level of resilience may have an impact on self-esteem performance levels in response to the conditions as a whole,(and not to individual conditions) .

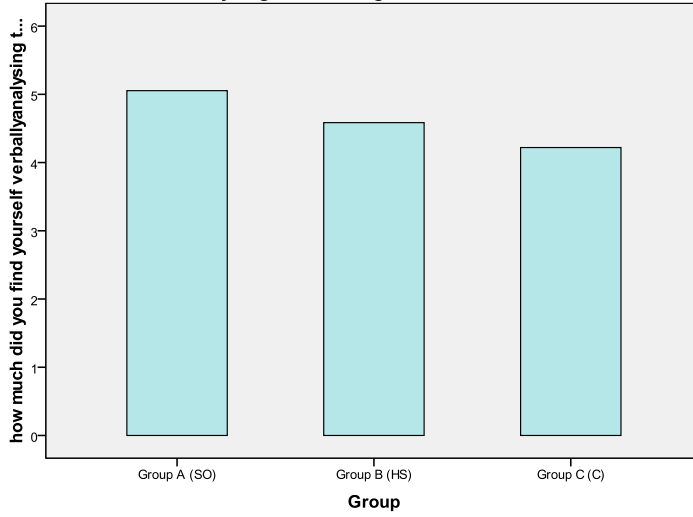## 6.5   Barcharts of manipulation questions in each condition

Estimated Marginal Means of how relaxed did you feel
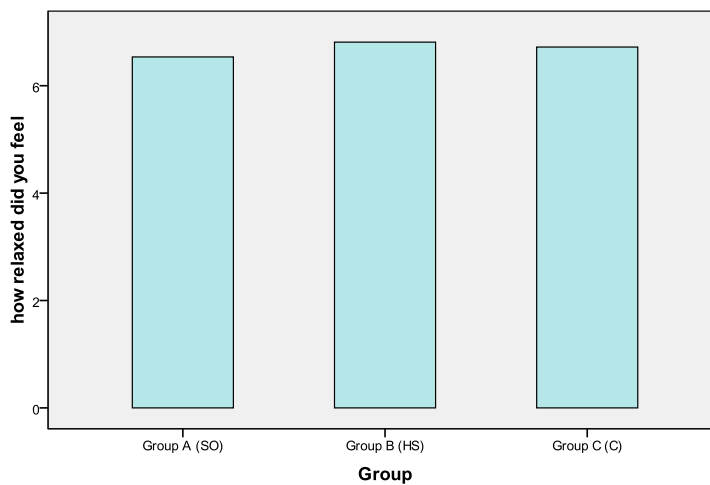
Estimated Marginal Means of how much did you find yourself thinking in images ie mental pictures and sensory impressions
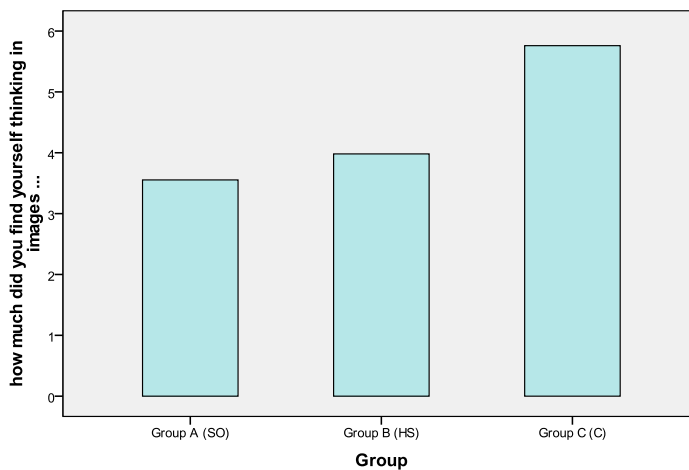
Estimated Marginal Means of how much did you find yourself verbally analysing the meanings of the words

Estimated Marginal Means of how much of the time did you find your mind wandering or daydreaming

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