DOCTORAL THESIS

The relationship between anxiety sensitivity, experiential avoidance and sociability in sleep quality

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The relationship between anxiety sensitivity, experiential avoidance and sociability in sleep quality

by

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ABSTRACT

Insomnia is a widespread disorder which has significant negative repercussions on a person's physical health, mental health, productivity and economic wellbeing. As pharmacological interventions cause significant adverse side-effects, considerable effort was made in developing better non pharmacological interventions in the form of therapy. The current recommended model is Cognitive Behavioural Therapy (CBT). CBT, as described by the literature on emotional regulation, can be seen as antecedent focused whereby negative emotions are controlled and changed in order to avert the negative consequences. Whilst CBT has shown efficacy, its effects are not necessarily long lasting since adherence levels to interventions drop significantly within 12 months.

As CBT also has smaller effect sizes in treating insomnia compared to other disorders, Acceptance and Commitment Therapy (ACT) is explored in the current study to see if there can be justification in utilising ACT in the treatment of insomnia. Whilst CBT is antecedent focused, ACT is response focused, whereby interventions aim to reduce suppression of negative emotions and to focus on living a life towards self defined meaningful values.

The current study utilised data from a survey of 327 participants to explore whether there was support in utilising ACT in the treatment of insomnia. The overall findings provided the support for further research into the ACT model in the treatment of insomnia. Through multiple regression, linear regression and mediation analyses, it was found that the six processes known as acceptance, cognitive defusion, being present, self as context, values and committed actions predicted experiential avoidance, it was also found that experiential avoidance was predictive of sleep quality and that experiential avoidance mediated the relationship between anxiety sensitivity and sleep quality. A hierarchical regression analysis however, found that sociability did not add to the predictive power of experiential avoidance on sleep quality. Methodological limitations are discussed together with their implications for future research.

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Chapter 1: Introduction and literature review

This chapter reviews the current knowledge relating to insomnia in both general and clinical populations. First, a definition of insomnia will be given. This will be followed by an overview of the extent and impact of insomnia. Second, an overview of how anxiety relates to insomnia is presented alongside the difference between anxiety sensitivity and trait anxiety as well as why anxiety sensitivity is adopted as the concept that is measured. Third, a history of the theory and treatment for insomnia is reviewed along with limitations of research findings. Fourth, Acceptance and Commitment Therapy (ACT) is presented along with its philosophical foundations, its assumptions on pathology, its theory towards improving psychological health as well as its implications in the treatment of insomnia. Lastly, the purpose, aims, objectives and hypotheses of the current study are given.

1. *Insomnia: definition, prevalence, incidence and societal context*

Insomnia is defined by the Diagnostic and Statistics Manual of Mental disorders 5th edition (DSM-V; APA, 2013) as a disorder comprising of dissatisfaction with quantity or quality of sleep and may refer to difficulty in initiating sleep, difficulty in maintaining sleep and/or difficulty in returning to sleep after early morning awakening. In order for a diagnosis to be made, certain criteria need to be met. The first is that this difficulty in obtaining satisfactory sleep quantity or quality causes clinically significant distress or impairment in social, occupational, educational, academic, behavioural or other important areas of functioning. Second, the symptoms occurs at least three nights a week and for a duration longer than three months. Third, the symptoms cannot be better accounted for by other sleep wake disorders. Lastly, the symptoms are not attributable to physiological effects of substances and not adequately explained by coexisting mental disorders or medical conditions. It is also important to note that an objective sleep assessment is not a prerequisite in diagnosing insomnia.

Chronic insomnia has been reported to be a widespread disorder (Hohagen et al., 1993; Leger, Guilleminault, Dreyfus, Delahaye, & Paillard, 2000; Backhaus, Junghanns, Broocks, Riemann & Hohagen., 2002). In western societies, prevalence has been reported to be from 10% to 40% (Ohayon, 1996; Hatoum, Kong, Kania, Wong, & Mendelson, 1998; Leger et al., 2000, Pearson, Johnson, & Nahin, 2006; Morin et al., 2006; Morin, Belleville, Belanger, & Ivers, 2011). The Mental Health Foundation (2011) in its Sleep Matters report, which was the largest ever survey of the UK population in regards to their sleep experience, described poor sleep as being a neglected public health concern which has wide ranging consequences. It reported that over 30% of the population suffered from insomnia or to a lesser extent, other sleep wake disorders such as narcolepsy and hypersomnia, which accounts for 0.045% and 0.3% respectively in the population. The findings revealed that sleep disorders placed sufferers at increased risk of health problems from depression, anxiety and other mental health conditions to physiological disorders such as immune deficiency and heart disease. Insomnia has also been associated with decreased morning awakening salivary cortisol which has been suggested to have functions in the hippocampus's preparation of the hypothalamic-pituitary-adrenal axis (HPA) to face anticipated stress (Fries, Dettenborn, & Kirschbaum, 2009), potentially reducing a person's ability to cope with stress.

In the data by the Sleep Matters report collected by the sleep organisation Sleepio, it was revealed that compared to those who did not suffer from insomnia, those that did were four times more likely to report relationship problems (55% of people with insomnia vs. 13% without insomnia) ; three times more likely to experience low mood (83% of people with insomnia vs. 27% without insomnia); three times more likely to lack concentration during the day (78% of people with insomnia vs. 26% without insomnia); three times more likely to struggle with daily tasks (68% of people with insomnia versus 23% without insomnia) and more than twice as likely to suffer from energy deficiency (94% of people with insomnia vs.

42% without insomnia). Other studies also corroborate with these findings whereby it has been reported lack of sleep can lead to increased fatigue and daytime sleepiness (Bliswise, 1996); and can also negatively impact metabolic, endocrine and immune systems (Spiegal, 2009; Knutson, Rathouz, Yan, Liu, & Lauderdale, 2006; Knutson, Ryden, Mander, & Van Cauter, 2006; Knutson & Van Cauter, 2008; Miller & Cappuccio, 2007).

It may therefore not be surprising that chronic insomnia has been associated with higher rates of absences from work, loss of motivation and/or increased difficulty in performing work related tasks (Leger, Guilleminault, Bader, Levy, & Paillard, 2002). One study has even suggested that the direct annual cost due to insomnia in the United States to be $12 billion in terms of health care services and fuels an industry for sleep medication in the tune of $2 billion a year (Walsh & Ustun, 1999). Both in Europe and in the United States of America, the number of prescriptions for sleeping medication has risen steadily over the years and there have also been spikes as economic downturns occurred (Ohayon & Lader, 2002; Chong, Fryar & Gu, 2013; Cascade, Kalali, Kwentus & Bharmal, 2009). Insomnia consequently has significant negative consequences for people in terms of physical health, mental health, productivity and economic wellbeing. Research into finding ways to improve sleep has therefore been vast due to its implications on personal, interpersonal and societal levels. Due to the significant negative consequences of poor sleep on so many levels, it would not be unexpected that poor sleep would evoke feelings of anxiety. Anxiety can thus arise as a result of the extra burden on relationships in both personal and work spheres caused by fatigue or maybe even from the fear of health consequences resulting from the lack of sleep over a prolonged period of time.

1.2 Anxiety and its implications to sleep

Research has indeed shown a negative relationship between anxiety and sleep (Taylor, Lichstein, Durrence, Reidel, & Bush, 2005) with the stress of anxiety impairing the quality and duration of sleep. The stress of high anxiety has been shown on polysomnography to reduce both the quality and the duration of sleep even in people who were not clinically diagnosed with any psychiatric disorders (Fuller, Waters, Binks, & Anderson, 1997).

The relationship between insomnia and anxiety works both ways in that anxiety can exacerbate sleeping problems but also at the same time, sleeping problems can also induce anxiety. Some form of sleep disruption is said to be present in nearly all psychiatric disorders and research has also shown that people with chronic insomnia are at elevated risk of developing anxiety disorders (Zee & Avidan, 2006). This is understandable as people with anxiety disorders are characterised with having nervous feelings and physical tension whereby they struggle with controlling their worries or ruminations which prevents them from relaxing. It has been pointed out that over 50% of patients with generalised anxiety disorder reported sleep disturbances, with difficulty initiating and maintaining sleep being the most common (Krystal, 2006). People with anxiety disorders also report high levels of psychological distress and difficulty in unwinding at night. Not being able to sleep can thus understandably increase anxiety levels and this can also be exacerbated by various beliefs of the harm that results in the lack of sleep such as increased risk of heart disease, stroke, diabetes and obesity.

1.2.1 Difference between anxiety sensitivity and trait anxiety

Anxiety is typically measured by two forms in the literature, one is through the concept of trait anxiety and the other is through the concept of anxiety sensitivity. Trait anxiety is generally viewed as vulnerability in the development of anxiety disorders (Eysenck & Van Berkum, 1992). It is intercorrelated with anxiety sensitivity (Taylor, Koch & Crockett, 1991; Silverman, Fleisig, Rabian, & Peterson, 1991) but conceptually different as trait anxiety is seen as a general tendency to react anxiously to anxiety eliciting stimuli whilst anxiety sensitivity is conceptualised as more of specific tendency to react anxiously to one's own anxiety and anxiety related sensations (Muris, Meesters, van Melick, & Zwambag, 2001). Anxiety sensitivity therefore can be defined as the fear of anxiety related sensations based upon the belief that these sensations lead to harmful consequences. These consequences can be related to physical illnesses, negative social evaluations and loss of mental capacity (Reiss, Peterson, Gursky, & McNally, 1986).

The concept of anxiety sensitivity is explored in the current study as it has been shown to be a more robust construct in relation to health related behaviour as it is often cognitive and somatic responses to feelings of anxiety that are related to negative outcomes (Taylor, 2014). Anxiety sensitivity can thus be seen as an anxiety amplifier, for example, if a person is highly anxiety sensitive, once they become anxious they may become alarmed about the arousal-related sensations they experience which causes further fear and intensifies their original anxiety. This formulation has been shown to have support in that anxiety sensitivity has been shown to be elevated in people who have been diagnosed with anxiety disorders and also anxiety sensitivity has been shown to predict the risk of future anxiety related symptoms (Taylor, 1999; Taylor & Amir, 2009; Taylor & Stanton, 2007).

Anxiety sensitivity is normally rendered into three factors commonly labelled as Physical Concerns, Mental/Cognitive Concerns and Social Concerns (Taylor, 2014). High scores on

Physical Concerns are associated with the belief that physical symptoms are caused by undiagnosed life threatening illnesses such as heart attacks or stroke. High scores on Mental/Cognitive Concerns are associated with the belief that physical sensations are a sign of becoming crazy or losing control of their minds. High scores on Social Concerns are associated with the belief that public showings of anxiety symptoms will result in rejection or negative evaluation (Zinbarg & Barlow 1996). The three factors have been shown to load onto a single higher order factor known as Global Anxiety Sensitivity.

When people score highly on anxiety sensitivity, their anxiety increases even more when they notice the physical symptoms associated with the anxiety they are experiencing and will perceive them as a sign of impending harm, which in turn increases the intensity and frequency of the physical symptoms and reinforces the catastrophic misinterpretations of these symptoms. Individuals with high anxiety sensitivity thus tend to overly focus and monitor their physical sensations and harmless physical sensations that previously went unnoticed suddenly become constantly and excessively present. In addition, high anxiety sensitive individuals possess a clear cognitive bias in the interpretation of information as they tend to interpret ambiguous information as threats to their wellbeing (Teachman, 2005).

The higher the anxiety sensitivity level in a person, the more likely it is that the person interprets the anxiety symptoms as distressing and harmful. Anxiety sensitivity, in the literature, has been shown to be a predictor of many anxiety disorders including social anxiety, health anxiety, panic disorder and post traumatic stress disorder. Research has also shown that anxiety sensitivity has been linked to various depressive disorders as well as chronic pain and substance abuse (Taylor et al., 1991; Taylor et al., 2007). Substances such as alcohol, cigarettes and drugs are then sometimes used in the aim to reduce the functioning of

the sympathetic nervous system with the hope that it reduces anxiety levels and regulates negative emotions. Avoidance of anxiety provoking triggers such as activities, people, objects, places is also a commonly used coping strategy. This avoidance of anxiety however may prevent people with high anxiety sensitivity to be exposed to the physical experience of the feared stimuli and hinders the possibility of realizing that the physical symptoms are not physically or mentally harmful (Hayes et al., 2006). Long term avoidance as a result of high anxiety sensitivity can therefore also increase the risk of developing severe anxiety and result in anxiety related disorders and the likelihood of poor sleep (Lundh, 2005). In the next section, the treatments for insomnia will be discussed alongside taking into account the role anxiety plays in instigating as well as maintaining insomnia.

1.3. History of theory and treatments for insomnia

The theory and treatment for insomnia can be divided into two forms, pharmacological interventions and non pharmacological interventions. An overview of the theory and interventions utilised in the treatment of insomnia are given below.

1.3.1 Pharmacological treatment for insomnia:

Traditionally medication was used for the treatment of acute cases of poor sleep. This may be when a person undergoes severe stressful life events such as bereavement, divorce or injury. It may also be used for minor stressful events such as exam stress, work stress or travelling between time zones. Medication was used as it was believed that artificially inducing sleep would be helpful whilst the person adjusted to the stressful situations or until the situation that was causing stress had resolved itself. The aim was therefore set to hide the symptoms associated with insomnia rather than to tackle the cause which was transient (Walsh et al., 2000).

Hypnotics are the most common treatment available and people with insomnia have relied on hypnotics such as benzodiazepines such as Valium or benzodiazepine-analogues such as

Zolpidem or Zopiclone to cope with their poor sleep (Nowell et al., 1997; Smith et al., 2002; Glass, Lanctot, Hermann, Sproule, & Busto, 2005; Backhuas et al., 2002). Systematic reviews have generally reported that hypnotics do improve sleep for people with insomnia in the form of increasing sleep latency, total sleep duration, sleep quality and reducing early morning awakenings. These improvements however are short term in their effectiveness as tolerance quickly develops and requires increasing the dosage over time. Withdrawal is also an issue as it is likely to bring about a number of side effects such as rebound insomnia and dependency. Sleep also tends to return to the pre-medicated state upon termination of medication (Nowell et al., 1997).

Since hypnotics have only been proven to be efficient in the short term and not for the management of chronic insomnia, there have also been concerns on the efficacy and safety of drug treatments for chronic insomnia in adults. Buscemi and colleagues (2007) conducted a meta-analysis of randomised control trials (RCT) and reported that all drug groups had significantly more side effects than placebo and reported cases of somnolence, headaches, dizziness, nausea and fatigue associated with the usage of pharmacological interventions. They did not find any reports of falls, injury or deaths that resulted from use of these medications however there remains some concern that the majority of the studies that were included in the review had private sources of funding which means negative results were less likely to have been published. Furthermore, the chance of interactions with other drugs such as antibiotics or substances such as alcohol is also another concern. Using medication to treat insomnia also has to take into account other medications a person has to take if there is co-morbidity with other disorders.

Worryingly, in a national health interview survey analysis (Pearson, 2006), it was reported that over 1.6 million adult US citizens used complementary and/or alternative medicine such as herbal and dietary supplements to treat their insomnia and this may not necessarily take

into account the number of people who use substances such as alcohol, caffeine or illicit drugs to cope with the effects the lack of sleep has on their daily lives. In the majority of cases, there is limited scientific evidence supporting the use of alternative remedies and even when there are, the general consensus is unclear. Melatonin is an example of this as it has been suggested to reduce sleep onset latency and also improve sleep duration. However, usage may also increase the likelihood of side effects such as mental impairment, headaches and even nightmares (Bliswise & Ansari, 2007; Bent, Padula, Moore, Patterson & Mehling., 2006).

Other herbal remedies such as valerian root has also shown some efficacy in improving the quality of sleep however the research has been criticised for its lack of rigor in trials (Taibi, Landis, Petry, & Vitiello, 2007; Sarris & Byrne, 2011). Worse yet, some remedies such as kava has been shown to be dangerous, with cases of liver damage and death being reported. Interactions with other drugs have also been highlighted to be a danger and Kava has been shown to increase the potency of other drugs being used at the same time such as other sleep medicines, alcohol and antidepressants (Teschke & Schulze, 2010).

In summary, the use of medications may be useful in acute cases of insomnia but in chronic cases of insomnia, it brings up issues with dependency, side effects, interactions with other drugs and also concerns as to whether they are effective and safe in the long run.

1.3.2. Behavioural therapy for insomnia

Whilst pharmacological treatments have been shown to have sedative effects, it is also associated with significant adverse effects. As a result, considerable effort had been put into utilising non-pharmacological treatments. Behavioural therapy has conceptualised chronic insomnia as involving predisposing, precipitating and perpetuating factors (Yang, Spielman, & Glovinsky, 2006). Predisposing characteristics may be genetic or underlying personality

traits such as baseline anxiety or arousal levels. Precipitating factors are the stressors which triggers the insomnia such as work stress or relationship difficulties which then make falling asleep more difficult. Perpetuating factors are the behaviours that individuals may enact in the effort to cope with sleep disturbances such as staying in bed to gain more sleep which actually creates further arousal and perpetuates the problem. This model therefore suggests that those have an anxious disposition or have hyperarousal are at risk of insomnia. This would make sense as insomnia has consistently associated sleep disruptions with elevated physiological arousal (Pavlova et al., 2001) and it has even been argued that insomnia is a disorder of hyperarousal which causes the sleep disruption (Bonnet & Arand, 1997).

The early wave of behavioural treatments aimed to deliver behavioural treatments that directly or indirectly reduced arousal and anxiety. These treatments included progressive muscle relaxation (Jacobson, 1938) and biofeedback (Hauri, 1981) to reduce physiological arousal. Paradoxical intention was also used to reduce arousal that stemmed from performance anxiety (Ascher & Efran, 1978; Ascher & Turner, 1989, Turner & Ascher, 1979). Another intervention known as stimulus control was used to reduce conditioned arousal in response to bed (Bootzin, 1972) and its use could also explain the common advice being bandied around that nothing apart from sleep and sex should occur in the bedroom. Lastly, sleep restriction therapy (Spielman, Sasky, & Thorpy, 1987) was the restriction of time in bed to mobilise homeostatic drive to sleep so as to offset hyperarousal.

These treatment strategies have met with success in that it is often just as effective if not slightly more so than pharmacological treatments (Morin, Stone, McDonald, & Jones, 1994; Morin et al., 1999; Murtagh & Greenwood, 1995) and effect sizes of behavioural interventions have been in the low to moderate range (Voinescu, Szentagotai, & David,2009). A criticism of Behavioural treatments however, has been that while it has been shown to improve sleep , one main problem is that they only address sleep onset problems, such as

difficulty in falling asleep but not for those who wake up during the night and are unable to return to sleep again. Another limitation of such studies has been that there has not been sufficient support for them to be recommended as evidenced based treatment. Lastly, behavioural therapy interventions are often studied as a behavioural treatment approach that comprises of multiple behavioural therapy interventions at the same time which means often it is necessary to tease out which intervention is the one that is most effective.

1.3.3. Cognitive therapy for insomnia

Advocates for cognitive therapy proposed that cognitive errors were at fault for psychological disorders and that common errors included minimising positive events, generalising negative events as well as catastrophizing and fortune telling (Beck, 1995). Cognitive therapy interventions were believed to be a crucial component in the treatment of insomnia after it was noted that acute cases of insomnia were at risk of becoming chronic due to worrying and rumination used by the individual to cope with not sleeping well (Ebben & Spielman, 2009). This paradigm shift allowed the mental aspect of insomnia to be scrutinised. Research therefore then focused onto cognitive arousal and the second wave of treatments targeted sleep related cognitions. Studies began to suggest that people with insomnia held maladaptive beliefs and attitudes about sleep (Morin, Stone, Trinkle, Mercer, & Remsberg, 1993). Worry, for instance, had been implicated in the maintenance of sleep disturbances since it evokes cognitive arousal (Kales & Kales, 1984). Once a person has a bad night of sleep, they may then fear another night of sleeplessness and the consequences on their functioning or wellbeing. This can instigate a vicious cycle as this arousal caused by anxiety consequently makes it harder to fall asleep.

Work has therefore been carried out on the different types of maladaptive cognitions that may occur when one experiences insomnia. These include maladaptive cognitions such as myths about sleep and the distortions or catastrophizing about sleep as a result of the implications it

may have on a person's health, social and work spheres. These maladaptive cognitions can increase the likelihood of safety or avoidant behaviours being utilised in order to ward off the feared consequences. Safety behaviours (Harvey, 2002) are specific routines or rituals that are believed to be prerequisites in falling asleep or limiting the consequences of poor sleep. Examples are avoidance of social functions and increasing time in bed to compensate. Sleep hygiene and stimulus control can potentially also fall into this category in the long term if used solely in order to achieve sleep. In essence, the safety behaviours reflect unwillingness to accept sleeplessness and its consequences which ironically perpetuate sleeplessness and causes frustration and anguish. The literature has also suggested conscious effort in sleep behaviours to be counterproductive to good sleep (Ree & Harvey 2004; Espie, Broomfield, MacMahon, Macphee, & Taylor, 2006; Morin et al., 1993).

Cognitive therapy therefore looked to address these maladaptive thoughts and beliefs through psycho-education and through experiments to allow more realistic appraisals to be garnered when a person with insomnia starts to experience anxiety upon not being able to obtain satisfactory sleep. For example, a person who believes that they will be unable to cope unless they attain 8 hours of uninterrupted sleep may experience anxiety and irritability due to concerns of their ability to cope after a sleepless night. Through education that not everyone gets the same amount of sleep and in testing out their fears, it can help to reduce the anxiety when they experience difficulty in sleeping (Harvey, 2002).

Harvey, Sharpley, Ree, Stinson, & Clark (2007) showed the use of cognitive therapy on insomnia and reported promising findings through targeting the maintaining processes of insomnia. The processes targeted were the unrealistic and maladaptive beliefs that maintained insomnia and interventions aimed to reappraise anxiety provoking thoughts related to sleep. Such thoughts includes worrying that insomnia would cause harm to their health and also induce anxiety in believing that they would struggle to cope with the tiredness and discomfort

they would feel after not sleeping well. After the cognitions are identified, reassurance, education and experiments are used to challenge these irrational beliefs in order to help reduce anxiety and improve sleep. The improvement from pre to post treatment and after 3 months, 6 months and 12 months was shown to be statistically significant however the study lacked a control group which means the improvement may not necessarily be completely attributable to the treatment. Furthermore, the small sample of 19 participants was also a limitation of this study due to issues with generalisability.

Typically, cognitive therapy is adopted as one of a number of components in multimodal approaches of insomnia such as cognitive behavioural therapy rather than adopted as a stand-alone treatment, Harvey et al. (2007) is one of the few studies which used cognitive therapy exclusively. The term Cognitive Behavioural Therapy for Insomnia (CBT-I) is now commonly used in the field of sleep medicine. This refers to utilising a combination of cognitive therapy interventions with the other behavioural approaches described in the previous section such as stimulus control, sleep restriction and progressive muscle relaxation. The rationale for this is that clinicians have reported that they found it more helpful for patients to use the CBT-I approach than just relying on one of the components exclusively (Ebben & Spielman, 2009).

1.3.4. Cognitive behavioural therapy for insomnia (CBT-I)

Cognitive behavioural therapy for insomnia is a combination of various behavioural and cognitive interventions. A number of different authors have presented conceptualisations of insomnia based on an integration of the behavioural and cognitive techniques. For example, Morin, Rodrigue and Ivers (2003) presented an integrated conceptualisation of insomnia which took into account emotional, cognitive and physiological hyperarousal as central mediating features of insomnia. They proposed that both maladaptive behaviours and arousal producing cognitions were dysfunctional responses to poor sleep and daytime fatigue. These

responses were also believed to maintain the disorder by creating vicious cycles of insomnia whereby people would catastrophize and overestimate the effects the lack of sleep would have on them and thus increase the likelihood that a person would try to overcompensate for their insomnia out of anxiety.

Espie (2002) also proposed a psychobiological inhibition model of insomnia that centred on the idea of people with insomnia being unable to de-arouse. In this model, the central processes of insomnia were the loss of automaticity which is defined as sleep being effortless, and plastiticity, which is where sleep is flexible rather than rigid. Both automaticity and plasticity were seen as characteristics of good sleepers. Good sleepers are said to be able to de-arouse at night and thereby able to attain good sleep. People with insomnia are said to have selective attention for sleep related cues and make explicit intentions to sleep. They therefore consciously use more effort to sleep. This effortful approach is seen as maladaptive and leads to failure to de-arouse at night and thus inhibits the homeostatic and circadian rhythms that regulate sleep. Espie also took into account how daytime factors could contribute to insomnia and how inaccurate attributions of impaired daytime functioning to poor sleep may increase sleep effort and lead to performance anxiety and increased arousal in the fear they will not be able to cope.

Harvey (2002) emphasised and applied cognitive theories of anxiety to the model of insomnia and proposed that cognitive processes at night and during the day also contribute to increased arousal and interfered with sleep and these processes such as worry, selective attention monitoring, misperception of sleep, unhelpful beliefs and safety behaviours all contributed to difficulty in sleeping. Harvey suggested that these processes can occur with or without real deficits in sleep or daytime function but become actual deficits due to prolonged increased arousal. Harvey and colleagues proposed the use of behavioural experiments as a way for

people with insomnia to test their sleep related arousal inducing cognitions so as to see if their cognitions were grounded in reality (Harvey et al., 2007).

The focus on cognitive processes was also used by Lundh and Broman (2000) who proposed a theoretical model based on two cognitive processes, sleep interfering processes and sleep interpreting processes. They argued that most theories of insomnia focused on sleep interfering processes which consisted of worries, negative emotions and thoughts related to stressful events that lead to arousal and thus interfered with sleep. However they argued that sleep interfering processes alone were insufficient for explaining insomnia and that sleep interpreting processes such as thoughts, perceptions and attributes about sleep and its consequences may combine and interact with sleep interfering processes to produce insomnia.

Ong, Ulmer and Manber (2012) recently also proposed a model that reconceptualises sleep related arousal and fits in with existing models of insomnia proposed by Harvey (2002), Espie (2002) and Lundh and Broman (2000). This model proposes that hyperarousal and failure to deactivate is central to the development of insomnia. The model stated that both primary and secondary arousal are key factors in developing and maintaining insomnia and that primary and secondary arousal paralleled first and second order metacognitive processes. They named this model as Metacognitive therapies for Insomnia (MCTI)

Metacognition can be defined as an awareness or knowledge of one's own cognitive processes (Flavell, 1976) and has been referred to as "thinking about thinking" or a meta level of governing of thoughts and beliefs. Ong et al. (2012) distinguished metacognitions from cognitions and conceptualised two levels of sleep related cognitive arousal. Primary arousal consisted of cognitive activity directly related to not being able to sleep, which includes thoughts that interfere with sleep and beliefs about day time consequences of insufficient sleep. Secondary arousal however, consisted of how one relates to the thoughts

about sleep. This includes the emotional tone one has to these thoughts and how attached they are to them. Secondary arousal is proposed to amplify the negative emotional valence or create biases in attention to the perception of sleep related thoughts at the primary level. Ong et al. (2012) gave the example that the thought "I need eight hours of sleep to function well the next day" creates primary arousal when the person is unable to sleep. Those with insomnia are said to have a rigid attachment to this thought which interferes with the possibility of alternative thoughts being considered and therefore amplifies the negative affect associated with the thought which produces secondary arousal. The degree that one believes thoughts as facts will determine the valence the thought generates and without the ability to allow for alternative thoughts to be considered, the model by implication suggests secondary arousal becomes the mechanism by which insomnia is perpetuated.

In its current form, CBT treatment for insomnia commonly consists of several components delivered within five to eight weeks and these components seek to educate the person suffering from insomnia about sleep education, sleep hygiene rules, sleep restriction, stimulus control, cognitive restructuring and relaxation therapy. CBT-I is used to tackle both sleep onset problems and sleep maintenance issues that affect sleep quality. Studies researching the efficacy of CBT-I however, have been mixed. For example, Edinger, Wohlgemuth, Radtke, Marsh, & Quillian (2001) tested the effectiveness of CBT, relaxation training and a placebo treatment on both objective and subjective evaluations in the treatment of insomnia. It was found that patients showed the biggest improvement with CBT compared to both relaxation training and the placebo treatment on both objective and subjective scales. The objective sleep measures however only showed modest though still statistically significant improvements. It should be noted that improvements in objective measures of sleep is not a prerequisite in treating insomnia though as the subjective improvements may be sufficient.

Unfortunately due to the non clinical sample used in Edinger et al.'s study, (2001) it may not be appropriate to generalise these findings to clinical samples.

Other studies such as by Edinger and Means (2005), have reported that individuals treated with CBT for insomnia report reductions in the numbers of awakenings during the night, total time asleep whilst in the bed, greater sleep efficiency, higher self-efficacy about sleep and fewer dysfunctional sleep related beliefs. More importantly, it has also been found that the benefits were long lasting (as much as 24 months post treatment) whilst also being just as effective as prescription medication without the adverse side effects associated with pharmaceutical interventions. These findings have also been supported in other studies where it was shown both long term cognitive behavioural therapy and short term behavioural therapy is effective in improving total sleep time and sleep efficiency whilst reducing sleep latency and negative sleep-cognitions (Backhaus et al., 2002; Schramm, Hohagen, Kappler, Grasshoff, & Berger, 1995).

Currently as it stands, CBT is the best proven therapy for treating chronic insomnia and research has also shown its efficacy in dealing with insomnia co-morbid with other psychological and medical disorders such as depression (Morin et al., 2006). CBT for insomnia has been shown to be more effective than control treatments and efficacy on subjective and objective sleep parameters in comparison to a control group for people with primary insomnia and found effect sizes ranging from small to large on various measures such as sleep onset latency, total sleep time, wake after sleep onset, total wake time, time in bed, early morning awakening and sleep efficiency (Okajima, Komada, & Inoue, 2011). Objective measures using polysomnogram or actigraphic evaluations also showed effect sizes ranging from small to large. The findings of this meta-analysis study were similar to a previous study conducted by Irwin, Cole and Nicassio (2006).

One very important point that needs to be brought up about the use of CBT in treating insomnia is that not all patients respond to it (Dalrymple, Fiorentino, Politi, & Posner, 2010). The effect sizes for CBT-I is also lower than the effect sizes for CBT on other psychological disorders such as anxiety disorders or somatoform disorders and general stress (Harvey & Tang, 2003; Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). As previously mentioned, CBT-I revolves around the adoption of several cognitive and behavioural components and not all patients are willing or able to adhere to the recommendations that the treatment suggest. Chambers (1992) actually stated that the 'failure of patients to carry out treatment recommendations may be the single greatest impediment to the success of a behavioural insomnia treatment program' and Harvey et al. (2002) provided support for this view as only 40% of patients adhered to the treatment recommendations at the one year follow up. This suggests that 60% of the patients reverted back to previous habits which were maintaining their insomnia. Riedel and Lichstein (2001) suggested that the poor adherence may also be due to counterintuitive instructions of restricting time in bed and postponing bed as well as the initial discomfort and fatigue in implementing cognitive and behavioural based treatment programmes.

1.3.5. Summary of the theory and interventions in the treatment of insomnia

The research presented in this chapter thus far has shown how the treatment of insomnia has developed over time. Pharmacological interventions such as hypnotics have been shown to be very effective for acute cases of insomnia however its use in treating chronic insomnia is confounded by issues of dependency, adverse side effects and potential interactions with other medications. Alternative medicines such as herbal remedies have also not had sufficient research into their efficacy and safety. Certain extracts such as Kava may also be dangerous as seen by reports of liver failure and its ability to increase the potency of other drugs used in conjunction.

Behavioural therapy methods have also shown good efficacy in reducing arousal and research has shown large effect sizes however one of the main problems with behavioural therapy methods is in getting the patient to adhere to the instructions given as sometimes the instructions are counter intuitive and often people revert back to old practices over time.

Cognitive therapy has also demonstrated efficacy in the treatment for insomnia however it is rarely used as a stand-alone intervention. Research into its efficacy is therefore limited when used solely on its own.

Cognitive behavioural therapy is a combination of the methods of behavioural therapy and cognitive therapy and research has shown that it is effective in treating insomnia. It has been seen to be more effective than hypnotics, which are not meant to be prescribed for longer than a month. It is currently the most evidenced based treatment for insomnia and effect sizes have generally ranged from low to high depending on the sleep measures utilised. Importantly, the effect sizes for CBT in insomnia are generally lower than those compared to other disorders and therefore there is suggestion that other treatment models may be as effective as and potentially more so than CBT-I.

1.4. Acceptance and commitment therapy

The treatment model that is proposed in this study is Acceptance and Commitment Therapy (ACT). To date there has been very little published research into its use for insomnia however Dalrymple et al. (2010) has demonstrated that ACT principals could be used to increase adherence to the behavioural therapy interventions of CBT-I.

Due to the lack of evidence in the field at the time, Dalrymple et al. (2010) could only justify incorporating principles of ACT into CBT-I rather than using ACT as a standalone therapy. They therefore suggested that certain principles in ACT could prove useful to people suffering from insomnia since there are often reports of struggling to sleep, especially with

increased effort (Espie et al., 2006). The increased effort and consequent failure in succeeding to sleep well often leaves people with frustration, anxiety and other psychological and physiological states of arousal. These struggles with sleep have then been suggested to increase the difficulty in achieving sleep and also increases the suffering caused by insomnia which can lead to a vicious cycle of insomnia being maintained (Lundh, 2005). ACT in essence could potentially help to tackle the struggle with emotions through its six processes which facilitate increased psychological flexibility and prevent the suppressing of or avoiding of negatively evaluated thoughts, feelings or emotions.

Dalyrmple et al.'s study (2010) demonstrated that certain ACT principles could be incorporated into CBT-I and this was demonstrated in their case study which increased adherence to counterintuitive instructions of sleep restriction and other behavioural techniques. However it is important to understand that that ACT and CBT-I are based on different philosophies and whilst ACT techniques can indeed increase adherence to the behavioural interventions, it may potentially become another safety or avoidant behaviour when used to exert control over emotions rather than to relinquish the perceived need to control for private experiences as aimed for by the ACT model. A complete ACT model approach in treating insomnia therefore has potential in the treatment of insomnia.

The same argument applies to Ong et al.'s (2012) model of insomnia which combines CBT with mindfulness and acceptance concepts to propose the importance of metacognitions. The authors did not use a complete ACT model but did speak highly of the two concepts which form an integral part of ACT in combating insomnia and psychopathology in general. As stated, the current study does not believe that ACT and CBT-I should be integrated due to its clashing philosophies and therefore proposes that ACT be examined on its own merits in seeing how viable its application to insomnia is. It is also believed that incorporating only mindfulness and acceptance to current CBT models as conceptualised by Ong et al. (2012) is

only a partial step forward as certain key processes in the ACT model such as values and committed action is considered to be integral to ACT yet it is not found in Ong et al.'s (2012) MCTI conceptualisation.

In the next section, ACT and its rationale is discussed along with how it shares some similarities with CBT yet differs in certain key aspects. At the same time, Emotional regulation is discussed as it demonstrates how ACT and CBT are both located within this literature field and can explain how ACT and CBT work through different pathways in the way they tackle negative emotions.

1.4.1. Philosophy of Acceptance and Commitment Therapy

ACT is intrinsically linked to the comprehensive active basic research program on the nature of human language and cognition known as relational frame theory and therefore consciously based on basic behavioural principles. Hayes (2004, P658) suggested that as part of the third generation of behaviour therapies, ACT is grounded on an empirical principle focused approach which is "sensitive to the context and functions of psychological phenomena, not just their form, and thus tends to emphasize contextual and experiential change strategies in addition to more direct and didactic ones. These treatments tend to seek the construction of broad, flexible and effective repertoires over an eliminative approach to narrowly defined problems and to emphasize the relevance of the issues they examine for clinicians as well as clients".

Accordingly, ACT is said to be philosophically rooted in the pragmatic philosophy of functional contextualism (Biglan & Hayes, 1997; Hayes & Brownstein, 1986; Hayes, Hayes & Reese, 1988) which is a specific variety of contextualism that concerns itself with the prediction and influence of events with precision, scope and depth (Hayes, 1993). Contextualism can therefore be seen as viewing psychological events as ongoing actions of

the whole organism interacting in and with historically and situationally defined contexts. A person's values and goals therefore specify how the pragmatic truth criterion of contextualism is applied (Hayes, Hayes, Reese, & Sarbin, 1993).

As a result, ACT can be seen to reflect its philosophical roots in several ways which includes the emphasis of workability as a truth criterion and chosen values as prerequisites to the assessment of workability because the values specify the criteria for whether something is workable. Its causal analyses are thus limited to events that can be directly manipulated and therefore has a consciously contextualist focus. From this perspective, thoughts and feelings are not causes for actions except when regulated by context (Biglan & Hayes, 1997; Hayes & Brownstein, 1986). This allows the justification to go beyond the attempts to change thoughts or feelings in order to change overt behaviour, as utilised in CBT, since it is the context that causally links these psychological domains.

1.4.2. Relational frame theory

From relational frame theory, there are four primary implications. Firstly, verbal problem solving and reasoning uses the same cognitive processes that can lead to psychopathology and therefore should not be eliminated as a process just because its overuse can lead to negative consequences. The second implication is that whilst extinction inhibits learnt responses, it does not eliminate these learnt responses and therefore in the same vein, cognitive networks cannot be restricted or eliminated either as the networks reflect historically learnt processes. The third implication is that direct change attempts focused on key nodes of the cognitive networks creates a context which elaborates the network in that area and increases the functional importance of that node. The final implication is that the content and impact of cognitive networks are controlled by distinct contextual features and therefore it is possible to reduce the impact of negative cognitions whether or not they occur in a particular form (Hayes, 2004).

The implications of relational frame theory thus suggest that it is not recommended and also unnecessary to focus primarily on the content of the cognitive networks in clinical intervention as CBT attempts but instead the focus should be on their functions.

The reason for the focus on functions is that ACT has contended that a primary source of psychopathology as well as an exacerbating factor in other forms of psychopathology is the way that language and cognition interact with “direct contingencies” which prevent a person in persisting in or changing their behaviour in order to strive towards their chosen values. This psychological inflexibility is said to arise from weak or unhelpful contextual control over the language processes itself and the model of psychopathology can be linked to the tenets of RFT (Hayes, 2004)

Cognitive fusion, which is where a person believes their emotions as facts of reality, is said to refer to excessive or improper regulations of behaviour by verbal processes and in contexts that foster such fusion, human behaviour becomes restricted by the inflexible verbal networks instead of the actual environment they experience. People therefore come to act in ways that are inconsistent with the environment they experience and prevent them from following chosen values and goals as the contextual features lead them to regulate their behaviour in unhelpful ways.

Functional contexts that can have negative consequences are also largely sustained by social/verbal communities. For example, symbols are treated as if they were facts of reality whilst a context of reason giving bases action and inaction excessively on constructed causes of personal behaviour, even though these processes are non manipulatable causes such as conditioned private events which include thoughts and emotions (Addis & Jacobsen, 1996; Zettle & Hayes, 1986). The result of this is that experiential avoidance is utilised on

manipulating emotional and cognitive states as a primary goal and thus used to measure how successful or happy a person is (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

1.4.3. Experiential avoidance

The contexts described in the previous section are seen to be interrelated and can explain why cognitive fusion is associated with experiential avoidance. Experiential avoidance is defined as the attempt to alter the form, frequency, or situational sensitivity of private events even though when doing so causes behavioural harm (Hayes et al., 1996). ACT points to the temporal and comparative relations present in human language which leads to emotions deemed as "negative" to be verbally predicted, evaluated and therefore avoided. This could explain why when one does not sleep, they begin to verbally predict and judge how badly it will be and negatively evaluate their ability to cope which then leads to seeking ways to avoid this predicted event despite the harm it may cause in the long run (Hayes et al., 2006).

Experiential avoidance is based on the natural language process and is a pattern that is amplified by the culture into a general focus on pursuing happiness and eliminating pain (Hayes et al., 1996). When applied to the mental domain and a person tries to avoid uncomfortable private events, it increases their functional importance since they become more prominent. The control efforts are seen to be verbally linked to conceptualised negative outcomes and therefore narrow the range of behaviours a person can use since only few options can avoid evoking the feared private events. This is also coupled with the social demand for reason giving and the practical utility of human symbolic behaviour draws a belief in the need to understand and explain psychological events even when unnecessary (Hayes, 2004). Resulting from this, people begin to "live inside their heads" and become detached from living in the present moment and absorbed in their conceptualised past or predicted futures. The conceptualised self as a result then gains increased regulatory power over behaviour and further contributes to the experiential avoidance. Emotions and thoughts

are then also commonly used as reasons for actions and this reason giving draws the person deeper into their inner world as a source of behavioural regulation and consequently increases their experiential avoidance.

The consequences of such actions is that it leads to long term desired qualities of life being put to one side whilst efforts are all diverted to attaining short term relief stemming from avoiding negative stimuli which creates anxiety. The actions all converge to avoid psychological pain such as anxiety and cognitive or somatic arousal rather than to strive towards chosen values that are personally meaningful and this leads to ever increasing patterns of action that dominate the person's life so that they remain detached from actually living in the present moment (Hayes et al., 2006).

1.4.4. Research into ACT for psychopathology and mental health

This theory of ACT and psychopathology has received much research interest and large numbers of correlation studies were conducted prior to 2006 (Powers, Zum Vorde Sive Vording & Emmelkamp, 2009). A limitation of correlation studies of course is that causality cannot be determined. However, the research does provide strong justification in continued research as the concept of experiential avoidance has been shown to be strongly associated with various measures of psychopathology. The concept of experiential avoidance is typically measured by the Acceptance and Action Questionnaire (AAQ) which is currently in its second revision (Bond et al., 2011). It measures the degree to which a person over identifies with their thoughts, avoids their feelings and is unable to live meaningfully in the face of difficult private events. This concept has been shown to be positively correlated with a number of self report measures of psychopathological symptoms from the Beck depression inventory (Polusny, Rosenthal, Aban, & Follette, 2004) and the PTSD checklist (Tull, Gratz, Salters, & Roemer, 2004) to measures of agoraphobia (Dykstra & Follette, 1998) and anxiety about pain (McCracken, 1998).

Importantly, The AAQ is not just correlated with important measures of psychopathology but also associated with behavioural effectiveness such as in job performance or chronic pain management. McCracken (1998) for instance, found that the higher the level of psychological flexibility as measured by their pain specific variant of the AAQ, predicted to a medium extent, less disability, better work status and higher daily uptime amongst people who suffered from chronic pain and were better predictors than actual pain ratings itself. McCracken, Vowles, & Eccleston (2004) also found that higher levels of psychological flexibility were related again to fewer pain related health care visits and use of prescribed pain medications.

Kashdan, Barrios, Forsyth, & Steger (2006) aimed to distinguish between experiential avoidance as measured by the AAQ from other coping strategies such as cognitive reappraisal, maladaptive coping, emotional response styles and controllability and found that the impact of all these other strategies on anxiety or daily mood outcomes were either fully or partially mediated by the AAQ. This seems plausible as a wide range of concepts and measures overlap with the AAQ such as distress tolerance (Brown, Lejuez, Kahler & Strong., 2002), thought suppression (Wenzlaff & Wegner, 2000), mindfulness (Baer, Smith, & Allen, 2004), metacognition (Wells, 2000) and decentering (Watkins, Teasdale & Williams, 2000).

In a study of distress produced by end stage cancer (Branstetter, Wilson, Hildebrandt & Mutch., 2004), cancer patients were randomly assigned to either 12 sessions of ACT or traditional CBT focused on relaxation and cognitive restructuring. The sessions were delivered during chemotherapy or other medical visits and by the end of 12 sessions it was reported that ACT produced significantly greater reductions in distress, anxiety and depression than in the CBT condition. It was also found that the ACT condition reduced mental disengagement whilst it increased it in the CBT condition. Furthermore, a study by Lappalainen et al. (2007) compared individualised treatment by trainee therapists using CBT

and ACT showed that clients receiving ACT reported better symptom improvement compared to CBT clients. The reasons for seeking treatment ranged from depression and mood problems to interpersonal problems, anxiety, work stress and sleep problems. ACT clients showed better symptom management though they reported more fear throughout the treatment process which is understandable as ACT does not try to reduce the frequency of negative emotions but rather the relationship with it. CBT however was found to increase self confidence. However, when self confidence was controlled for, CBT no longer became predictive of better outcomes whilst ACT remained predictive. ACT was also shown to have larger effect size compared to CBT (d= 1.04 vs. 0.24). Unfortunately due to this study's preliminary nature which includes a relatively small sample size, the promising results need to be taken with caution.

Controlled trials have also demonstrated that ACT is beneficial for anxiety and depression, depression alone, physical health problems and other mental disorders. In a meta-analysis, ACT was shown to outperform control conditions on both primary and secondary outcome measures both after treatment and at follow up. When analysed separately, it was also shown to be superior to all control conditions except for treating distress problems (anxiety and depression) but was not seen to be significantly more effective than CBT or CT though the authors argued that this is not necessarily a weakness (Powers et al., 2009). Powers et al. (2009) thus recommended that further studies were needed in which ACT is compared with empirically supported treatments for specific DSM disorders before widespread applications in clinical care can be recommended despite the promising results.

As shown in the research discussed above, ACT has shown strong potential in its application to treating mental health disorders. In order to understand how ACT works to move away from experiential avoidance and towards psychological flexibility, it is important to understand the six core processes it has in place.

1.4.5. The six processes of acceptance and commitment therapy

ACT aims for psychological flexibility and treating psychopathology through cultivating the six core processes of acceptance, cognitive defusion, being present, self as context, values and committed actions. Each is encouraged to be seen as a positive psychological skill rather than merely as a method of avoiding psychopathology (Hayes et al., 2006). The six processes as described below can be seen to overlap and are interrelated and taken as a whole, each process supports the other and all work together to increase psychological flexibility. Mindfulness can also be seen to be the functional behavioural equivalent of the first four processes of ACT and thus hard to separate into its individual processes (Fletcher & Hayes, 2006). This is especially the case in the current study which utilises the shortened version of Freiburg Mindfulness Inventory by Walach et al. (2006). As reported in the paper, the items in the shortened version are not readily separable and have considerable second loadings which suggest that the scale measures the general factor of mindfulness rather than clear dimensionality of the constructs. This is not particularly a problem however as the factors derived from the principal component analysis showed that four factors could be identified as "Non-Judgemental Acceptance", "Openness to Experience", "Insight" and "Mindful Presence". These four factors can be seen to map on to the four processes described below in chronological order.

1.4.5.1. Acceptance

Acceptance can be seen as the opposite of experiential avoidance. It is the willingness to experience all psychological events such as thoughts, feelings and emotions inclusive of those that are negatively evaluated such as anxiety (Hayes, 1987; Hayes et al., 2006) without acting on the impulse to control, change or avoid them in anyway. It is theorised that acceptance of internal events allows people to redirect their energies, which were previously

expended on trying to change the internal events, into being spent in living more in line with their values and goals.

ACT promotes acceptance through training people to become more aware of their thoughts and feelings and to allow themselves to experience the emotion without trying to alter the intensity or duration of it. This allows them to let go of the struggle with the negative emotion (Eifert & Forsyth, 2006; Eifert & Heffner, 2003; Hayes et al., 2006). Acceptance also helps a person become more in touch with value based actions whereby they can spend time sitting with emotions rather than to try to chase away emotions that are negative or to chase after emotions that are evaluated as "good".

1.4.5.2. Cognitive defusion

Cognitive defusion is a process whereby the relationship to the undesirable function of thoughts and private events is altered rather than trying to alter its form, frequency or situational sensitivity (Hayes et al., 2006). The aim therefore is to change how a person interacts or relates to their thoughts by creating contexts whereby their unhelpful functions are reduced. Resulting from this change in relationship with the private events, the believability and attachment to the thoughts are disrupted and reduces the likelihood that the person would act as if the private event was a product of reality.

This awareness would then also reduce their attempts to control their private events that are part of the problem rather than the solution. The use of thought suppression is a key example of this. In the case of anxiety disorders, people would learn that it is the unsuccessful attempts to control their anxiety that drives the anxiety to be so intrusive rather than the anxiety itself which would come and go naturally. In sleep, people would learn that it is the attempt to control their sleep that makes it more elusive. People are therefore taught to learn not to act

upon their thoughts and feelings and to give up the need to control their thoughts but to merely observe them for what they are.

1.4.5.3. Being present

Being present is promoted by ACT through ongoing non judgemental contact with psychological and environmental events as they occur in real time. The goal is to allow the person to experience the world more directly so that their behaviour is more flexible and in line with the values they hold rather than influenced by regrets in the past or worries about the future which then influence the way they live in the present moment (Hayes et al., 2006).

Direct experiential contact allows greater clarity towards the consequences of actions and non actions as in the case of experiential avoidance so that a person can see how workable their behaviour is towards meeting valued ends.

The role of language is also altered in that it is not used as a way to evaluate but as a tool to note and describe events so as to bring these events and their consequences into awareness. Being present thus allows the sense of self known as “self as process” to be developed through the use of non judgemental ongoing descriptions of private events instead of becoming attached to the events themselves (Hayes et al., 2006). An example of this would be when finding it hard to fall asleep, rather than becoming fused with the negative prediction of how the night will unfold, a person would begin to describe the thoughts and emotions they were experiencing so as to have some distance from the private experiences.

1.4.5.4. Self as context

Related to the “self as process” and through the relational frames such as “I versus You”, “Now versus Then” and “Here versus Now”, human language leads to a sense of self as a locus of perspective and provides a transcendent, spiritual side to normal verbal humans

(Hayes et al., 2006). This means that the "self as process" reflects the act of observing experience whilst the "self as context" reflects the observer that does the observing.

Self as context is important since from this standpoint, a person can become more aware of their own flow of experiences without attaching to them or investing heavily on specific experiences to occur which may lead to attempts to manipulate their private experiences.

1.4.5.5. Values

Values in ACT represent chosen qualities of purposive action which cannot be obtained as an object but can be strived towards moment by moment. ACT utilises a range of exercises in order to clarify a person's life directions in domains such as family, career and spirituality whilst undermining verbal processes that reduce the choices available through avoidance, social compliance or fusion (Hayes, Strosahl, & Wilson, 1999).

It is also important to note that acceptance, cognitive defusion, being present and self as context are not ends in themselves but rather feed into encouraging a person to live a life that is more consistently value based (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Strosahl et al., 2004). In this current study, values were measured through the following operationalisation of the well-being factor in the TEIQue Short form: "High scores on this factor reflect a generalized sense of well-being, extending from past achievements to future expectations. Overall, individuals with high scores feel positive, happy, and fulfilled. In contrast, individuals with low scores tend to have low self-regard and to be disappointed about their life as it is at present" (Petrides, 2001).

1.4.5.6. Committed action

Lastly, ACT encourages the development of increasing usage of effective action linked to the chosen values which can be seen to be in line with behaviour therapy which has its techniques in exposure, skills acquisition and goal setting. Unlike values, which are strived towards but never truly attained as an objective, concrete goals that are value consistent can be attained. In this current study, committed action is measured by the combined score of the Brief Cope items of active coping and planning as at the time of the start of the study, no specific and validated measure was available to be used to measure committed action according to the criteria of ACT.

1.4.5.7. Summary

The six components can be seen to overlap and are interrelated and taken as a whole, each process supports the other and all work together to increase psychological flexibility. Hayes et al. (2006) have also suggested that the AAQ, which is often used as a measure of experiential avoidance, is actually a general measure of the 6 ACT processes and has also been conceptualised as a measure of psychological acceptance (Bond & Bunce, 2000).

Hayes et al. (2004) propose that mindfulness can cultivate these six core processes. They argue that people high in experiential avoidance excessively take language and therefore their thoughts literally. This makes it difficult for a person to attend to their thoughts without constant evaluation of whether it is good or bad because language based evaluation represents a natural process that allows immediate short term benefits such as problem solving and suppression of undesirable experiences (Hayes & Shenk, 2004).

Through an ACT perspective, mindfulness creates a context in which a broader range of stimulus events are contacted psychologically (Hayes et al., 2006). It encourages awareness

in all aspects of experiences even whilst one or more particular aspects may be brought into immediate focus. Stimulus control exerted by literal language weakens and results in expansion of avoidance events from physical sensations to personal life priorities, in a given situation, that may be used to regulate behaviour (Hayes & Shenk, 2004).

This perspective is supported by the research on insomnia as Harvey (2001) found that people with insomnia reported higher usages of thought control strategies than compared to good sleepers. When instructed to suppress their thoughts explicitly, people with insomnia also reported taking longer to fall asleep and also experienced poorer sleep quality when compared to a control group (Harvey, 2003). This can be seen as being related to experiential avoidance as poor sleepers are trying to stop certain thoughts in the hope to alleviate feelings of anxiety that would lead to the negative outcomes of not sleeping well but this strategy also places them at risk of developing maladaptive or pathological functions to sleep, potentially also leading to substance abuse in order to satisfy dispositional based personal needs (Cooper, Russell, Skinner, & Windle, 1992; Stewart, Zvolensky, & Eifert, 2002).

Hayes et al. (1999) claimed that experiential avoidance is the “verbal overregulation of experiences, thoughts and feelings” and the concept is similar to controlled information processing (Schneider & Chien, 2003), which when used in daily life can be functional but when used to eradicate private experiences, it causes high anxiety and dysfunctional coping which can lead to human suffering and psychopathology. Research has also shown that controlled information processing, which is adopted in the day and not disengaged during the night, leads the person to continue to be both physiologically and emotionally aroused at night. They would then find it hard to drift off to sleep, thereby risking the development of insomnia. This argument has been given weight through a study involving the cognitive emotional self observation task (CEST) by Lundh and Hindmarsh (2002). It involved participants during the day being asked to lie down in a dark room for five minutes and to

observe their thoughts, feelings and body sensations without trying to alter or change them in any way. Afterwards they had to fill in questionnaires that asked them to describe the kinds of thoughts they experienced, how difficult it was to remember them which was measured as Meta cognitive awareness, how much they tried to control them which was measured as meta cognitive control and also their emotional state in regards to alertness/arousal, happiness, tension/worry, anger/annoyance, sadness/depression, tiredness/sleepiness and pleased/relaxed bodily feelings. It was discovered that when measured in the day with the CEST-d tool, it had high criterion validity in predicting the corresponding cognitive and emotional measures during night time as measured by the night time version of the CEST.

Lundh and Hindmarsh's study (2002) supports the idea that daytime metacognitive awareness, negative affect and alertness may be relatively stable aspects of individual functioning and not different from the night time pre sleep situation as the person is unable to disengage from this controlled information processing. As stated, verbal overregulation of psychological processes has been argued to be associated with human suffering and psychopathology and support for this claim can be found in that people with generalised anxiety disorder also relied more on verbal thinking and suppression of imagery, affect and emotional processes than the control group (Borkovec, 1994). The finding therefore supports the idea that verbal overregulation of thought processes is linked to dysfunctional behaviour and Nolen-Hoeksema's research (2000) has also linked verbal rumination and the development and maintenance of depression as well as other anxiety disorders.

In fact, Morin et al. (2003) showed that people with insomnia had similar levels of stressful events compared to good sleepers however what differed was how people with insomnia evaluated the stressful event and how intense they felt the stress to be, which highlights the difference between the concepts of trait anxiety and anxiety sensitivity.

The transactional theory of stress may also explain why people with insomnia evaluate stress differently to normal sleepers. The transactional theory of stress (Folkman et al., 1986; Lazarus & Folkman, 1984) conceptualises stress as an individual process where context is crucial. The model states that psychological stress is the "particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing" (Lazarus & Folkman, 1984, p19). This implies that stress is a dynamic process due to the interaction between the individual and environment changes as either factor varies over time and over different contexts (McEwen, 2004). According to this model, appraisal, which is the evaluation that individual makes of the demands and resources available to deal with them, represents the key ingredient in stress.

Stress occurs when the transaction between the person and the environment is appraised as harmful, threatening or challenging to a person's wellbeing (Lazarus, 1995). Harm can be defined as damage that has already occurred such as the fatigue or tiredness one feels after poor sleep. Threat is referred to the potential harm that is anticipated to occur whilst challenge is when the person believes they have the capacity to meet the demands being asked of them. Appraisal of harm therefore leads to feelings of endangerment, defensiveness and self protection (Lazarus, 1995).

In the literature, coping strategies tend to be grouped together as either Emotion Focused Coping (EFC) strategies or Problem Focused Coping (PFC) strategies. PFC strategies typically involve approaches that that try to resolve the stress situation or to alter the source of the stress. EFC strategies however, attempt to eradicate the emotional distress that a stress situation brings. Typically EFC strategies prevent adaptive coping whilst PFC strategies are seen as more adaptive.

Researchers in the field tend to disagree how to group the different coping strategies and have also warned that certain coping strategies can be classed as either a PFC or EFC dependent on context. Such coping strategies are social support and positive reframing which may fit into either group (Lazarus & Folkman, 1984; Carver, Scheier, & Weintraub, 1989). PFC was comprised of strategies that directly addressed the stressful situation or did not aim to reduce stress on a superficial level. EFC in contrast was comprised of strategies that aimed to reduce or manage one's emotional reactions and feelings of stress.

Within the appraisal process, personal values and goals play a role in stress and its outcomes (Lazarus & Folkman, 1984) and it is proposed that secondary appraisal, in which coping options for dealing with harm, threat or challenges are assessed and integrated with the primary appraisal process. Primary appraisal concerns whether or not there is a personal stake in the encounter in order to ascertain in the first place whether it is perceived as harm, threat or challenge and whether the situation is perceived as significant enough to affect one's wellbeing. The idiosyncratic nature of the personal goals and beliefs coupled with the complexity and ambiguity of the environment leads individuals to attend selectively to experiences and evaluate it in diverse ways (Lazarus, 1995). The transactional process model of stress is therefore very similar to ACT's process orientated contextual approach which emphasises personal values.

The research has so far pointed to insomnia being linked to verbal overregulation of the processes of sleep and whilst it serves its purpose in daily life, when it is not disengaged during pre sleep, it leads to poor sleep. At the same time, the verbal regulation of cognitive and emotional processes that evaluate the lack of sleep occurring leads to worry, rumination and further attempts to verbally regulate (Harvey, 2000). This has been given support by studies which have shown higher degrees of rumination being associated with longer sleep

latencies and poorer sleep quality, even when controlling for negative mood (Thomsen, Mehlsen, Christensen, & Zachariae, 2003). Nelson and Harvey (2002, 2003) also reported that that excessive verbal thinking was counterproductive with sleep and daytime functioning in that it was associated with longer sleep latencies and more anxiety and discomfort the next morning as compared with thinking about the same stressful matters in terms of mental images (Nelson & Harvey, 2002). They also found that insomnia patients showed less pre sleep imagery than good sleepers (Nelson & Harvey 2003) which again supports the theory that they are trying to suppress thoughts or feeling states. According to Lundh (2005), it is difficult to fall asleep by telling oneself to do so and all kinds of strategies for falling asleep have the potential of backfiring if the efforts involved lead to an increased arousal. Attempts at verbal regulation of cognitive and emotional processes in the pre sleep situation are therefore also likely to be dysfunctional.

As stated previously, CBT has had notable success in treating insomnia but the effects have been much smaller than those in other disorders treated (Okajima et al., 2011). There have been significant issues with the behavioural techniques being adhered to over time which means that a significant percentage of those treated with CBT revert back to previous habits which maintained their insomnia (Harvey 2002). This was what justified Dalrymple and colleagues (2010) to suggest that ACT could be integrated into CBT-I so as to increase adherence to the behavioural interventions but as shown in the literature above, this may not be a solution as it can serve to strengthen the belief that reappraisal is necessary or that the content needs to be changed. Ong et al.'s (2012) inclusion of acceptance and mindfulness into existing CBT models is also lacking as it does not include the use of values and committed actions which is deemed integral in the ACT model.

Thus far it has been explicated as to the rationale for the use of ACT in the treatment of insomnia. The following section discusses how ACT and CBT may work by targeting

different processes and why ACT is potentially just as effective if not more so than CBT especially as both models can be placed within the literature of Emotional Regulation.

1.5. Emotion regulation

Firstly it is important to appreciate that people deal with emotion in different ways. Positive emotions tend to be experienced and expressed freely but negative emotions are more likely to be suppressed (Thompson, 1994). Suppression and avoidance are tempting strategies that aim to inhibit emotions that a person does not want or does not want another to see them experiencing. The techniques are often appealing as they can be helpful in the short term to numb feelings but used chronically it can actually maintain or even increase the overall experience of the negative emotion being experienced (Campbell-Sills & Barlow, 2007; Gross & John, 2003; John & Gross, 2004)

Problems with emotion or emotional regulation strategies are said to characterise more than 75% of the diagnostic categories of psychopathology in the DSM IV and in certain mood and anxiety disorders, emotion dysregulation is a prominent criterion that is defined on the basis of disturbed emotions (Mineka & Sutton, 1992). Werner and Gross (2009) therefore suggested that emotion regulatory difficulties are a key factor in the development of disorders and therefore also potentially the key to their treatment.

From a functionalist perspective, emotions evolved because they can be adaptive responses to the problems and opportunities that humans are faced with (Gross & Levenson, 1993). Problems tend to occur with emotions when they hinder or occur in unsuitable contexts or are too intense or long lasting. This causes the possibility of people wanting to gain distance from these uncomfortable emotions. When an emotion is not viewed as adaptive, one may become tempted to engage in acts that try to alter, control or suppress the unwanted emotion.

Gross (1998) proposed a temporal model of emotional regulation referred to as the process model of emotion regulation whereby strategies were distinguished in terms of when they have their primary impact on the emotion generative process. He distinguished between the impacts occurring before the response which is labelled as antecedent focused or after the response which is known as response focused. Antecedent focused strategies refer to strategies that are used before the behavioural and physiological emotion response tendencies are fully activated. An example for antecedent focused strategies is avoiding strenuous activity due to fear of not sleeping and feeling fearful or irritated in having to deal with the fatigue. Response focused strategies occur once an emotion is already underway and therefore an example is a person with insomnia turning to substances or medication to self sooth when they are unable to sleep.

In this process model of emotion regulation, five groups of specific emotion regulation strategies are located along the time line of the emotion process. It is important to note that the model's distinctions are only conceptual and that emotional regulation typically involves multiple regulatory processes however this process model does provide a useful conceptualisation for understanding the causes, consequences as well as mechanisms underlying the emotion regulation strategies.

1.5.1. Situation selection

The first emotion regulatory strategy is situation selection. A person is able to choose whether or not to enter into a potentially emotion eliciting situation. This can involve choosing or avoiding certain people, places or activities so as to regulate emotions. This strategy fits well into the assumptions of ACT in that experiential avoidance of people and places at night may be due to the fear of being over stimulated which is believed to consequently prevent sleep. Persistent avoidance of safe situations can consequently maintain

pathological fear and negatively affect psycho-social functioning and diminish quality of life (Campbell-Sills & Barlow, 2007).

Situational avoidance as a result can cause people to miss out on enriching social, academic, occupational and leisure activities. It may also cause people to feel anger, guilt, shame or sadness at missing out on these aspects of their lives. This may lead to an overall increase in negative emotions even if they have avoided the acute distress associated with the avoided situation (Rusting & Nolen-Hoeksema, 1998). The short term benefits of avoiding negative emotion inducing situations can thus be seen to come at the cost of long term situational avoidance, withdrawal, self defeating thoughts and emotions (Barlow, 2000; Leary, Kowalski, & Campbell, 1988). For example, a wish to have a fulfilling family life is prevented if a person who has sleeping difficulties refuses to accept the fatigue that is associated with poor sleep and thus spends all his efforts in trying to eliminate this feeling at the expense of spending time with his family.

People have also been found to be inaccurate at predicting their emotional responses to future scenarios as they tend to overestimate how long their negative responses and positive responses to be (Gilbert & Andrews, 1998). People with depression may also underestimate how much they will enjoy a particular event and thus avoid it (Jacobson, Martell, & Dimijian, 2001). This can lead to social withdrawal as it is used to avoid immediate feelings of sadness or negative mood that a social event may cause. The long term effects however is that it may lead to poorer health and wellbeing.

1.5.2. Situation modification

The second emotional regulation strategy is situation modification. Once a situation has been selected it can be modified in an attempt to change its emotional impact. Clark (2001) noted that individuals could expose themselves to anxiety producing situations on a daily basis yet their anxiety does not get extinguished and found that this was because they were not benefiting from their daily exposures due to the use of situation modification strategies. This means that when the feared situations fail to occur, people attribute it to their adopted safety behaviour rather than the situation actually not being dangerous. Situation modification can be especially maladaptive when it monopolises cognitive resources and draws more attention to the person or increases their negative self focused attention and monitoring (Vassilopoulos, 2008).

1.5.3. Attentional deployment

The third emotion regulation strategy is attentional deployment. It can be used to choose the aspects of a situation to focus on and once an aspect of a situation is chosen, attentional deployment is used to select which of the many possible internal situations are active for the individual at any point in time and the process model states that attentional deployment occurs when it is not possible to avoid or modify the situation. Specific forms of attentional deployment are rumination, worry and distraction.

Rumination involves attending to and evaluating thoughts and feelings associated with past events. It typically involves repetitive attentional focus on feelings associated with negative events, along with negative evaluation of their consequences. As a result, rumination regarding negative events has been associated with increased levels of negative emotion (Bushman, 2002; Morrow & Nolen-Hoeksema, 1990). Vassiolpoulos's study (2008) found that people with anxiety who engaged with a seven minute rumination task and told to either

attend to their experience or to evaluate their experiences, those in the non evaluative condition reported more positive thoughts on a thought listing exercise and decreased anxious mood pre to post exercise. This suggests that it is the evaluative aspect of rumination, which judges the experience as good or bad, that is problematic rather than the attention which is non judgemental.

Worry is similar to rumination but is future orientated and in anticipation of negative events. It is also a problematic attentional deployment strategy used by many with anxiety disorders (Borkovec, 1994). As attention is focused on possible future threats, it has the effect of increasing anxiety and decreasing processing of negative emotions. Borkovec (1994) also found that worry also served as a method for avoiding intense emotion or physiological arousal and that worrying can reduce physiological arousal to an imagined public speaking event (Borkovec & Hu, 1990). Dampening of physiological arousal can be tempting in the short term due to it reducing the level of distress but it can also lengthen decision making times (Metzger, Miller, Cohen, Sofka, & Borkovec, 1990) and prevent habituation to the emotional stimuli so that they believe worrying is what has helped them cope rather than seeing the worry as a maintenance factor (Butler & Gross, 2004).

Another common form of attentional deployment is distraction where a person refocuses attention on non emotional aspects of a situation or mentally checks out of the immediate situation altogether (Posner, Rothbart & Sheese, 2007). Distraction can also involve changing the internal focus such as when individuals invoke thoughts or memories that are inconsistent with the undesirable emotional state. When distraction is automatic and chronic it is likely to be maladaptive as it also prohibits a person from being able to habituate to a feared stimuli and learn that they are not necessarily threatening.

1.5.4. Reappraisal

The fourth strategy in emotion regulation is reappraisal. Cognitive change refers to the changing the way one constructs meaning of the situation in order to alter its emotional significance and therefore how it affects an individual. In general, research has shown that reappraisal is an adaptive emotion regulatory strategy and its usage is associated with higher levels of positive effect and lower levels of negative effect (Gross & John, 2003). Reappraisal has also correlated positively with interpersonal functioning, fewer depressive symptoms, greater self esteem, life satisfaction and wellbeing (Gross & John, 2003).

Reappraisal may involve changing either appraisals related to the situation or appraisals related to one's emotional responses to that situation. It has however also be been shown to potentially actually maintain negative emotional states (Nolen Hoeksema, 2004). Two categories of reappraisals have been associated with psychopathology. The first is Self elaboration (Northoff et al., 2005), where a person judges situations in a way that reflects negatively upon themselves. For instance, in not sleeping, they may believe they would be seen as useless in their work and therefore get fired from their job. The second category is emotional resistance which is when a person refuses to accept their primary emotional experiences and struggle to rid that emotion (Hayes et al., 2006).

Self elaboration of meaning increases emotional responses such as increased intensity of emotions and increased number of negative emotions. Smith and Greenberg (1971) examined the link between depression and private self-consciousness and found that those who scored higher on the depressed mood questionnaire also scored higher on measures of private self consciousness. On testing the self regulatory self focused theories (Carver & Scheier, 1981; Hull & Levey, 1979) participants were put into an induced self focus condition whereby they would hold a mirror to themselves and be asked them to read or write passages that includes

the words “I” and “me” in them. It was found that dysphoric individuals who are made to self focus by such manipulations tend to experience increased negative affect and reductions in negative mood when they did not self focus. Self elaboration is therefore linked to the creation of secondary responses or dirty emotions (Hayes et al., 2006).

The second category of reappraisal that may be particularly important for psychopathology are beliefs about which emotions are okay to have and which are not (Hayes et al., 1999; Hayes, 2003). This influences what becomes regulated and research into the acceptability of emotions has found that unwillingness to experience negative emotions and subsequent attempts to avoid feelings such as anxiety or depression can maintain psychopathology (Hayes et al., 2006) Beliefs about the acceptability of emotions can thus lead to emotions about emotions and when these emotions about emotions are negative, for example, “I hate myself when I’m anxious”, it leads to frantic efforts to diminish this second layer of negative emotions.

Western culture may also encourage feeling happy and positive as an ideal and those who are unable to attain this may feel like failures (Hayes et al., 1999; Hayes, 2004). People from western cultures therefore may have strong aversions to feeling negative and have the urge to resist private experiences such as uneasiness, anxiety, sadness, loneliness, boredom and irritation as soon as they appear (Hayes et al., 2006). Research has shown that there is indeed an association between negative reactions to emotions and psychopathology. For instance, greater fear of negative and positive emotions found in people diagnosed with general anxiety disorder or separation anxiety disorder (Turk. Heimberg, Luterek, Mennin, & Fresco, 2005) and reduced acceptability of emotions has also been shown in generalised anxiety disorder and panic disorder (Tull, 2006).

The first four families of emotion regulation strategies are initiated before the emotional response occurs and thus antecedent focused. The last one occurs after the response and is known as response modulation and refers to attempts to influence response tendencies such as facial behaviours or expression of the associated thoughts and feelings (Gross, 1998; Gross, 2002). It is a way to try to manage unwanted emotions and can be used in both adaptive and non adaptive ways.

1.5.5. Response modulation

Response modulation is said to influence experiential, behavioural and physiological responding as directly as possible, two of the most researched forms of response modulation are expressive suppression which refers to the effort in inhibiting ongoing emotion expressive behaviour (Gross, 1998) and experiential avoidance, which refer to the efforts to inhibit the emotional experience itself (Hayes & Wilson, 1994; Kashdan et al., 2006).

Gross and colleagues have documented that individuals instructed to use expressive suppression whilst viewing emotion provoking films were more successful in decreasing expressive behaviours (Gross, 2002; Gross & Levenson, 1998). Expressive suppression had been reported to decreases the subjective experience of positive emotion but has no effect on the subjective experience of negative emotion. Suppression however also produces negative biological and cognitive effects such as increased sympathetic nervous system activation and impaired memory (Campbell-sills, Barlow, Brown, & Hofmann, 2006; Richards & Gross, 2000).

Marcks and Woods (2006) also found that individuals who tended to naturally suppress their expressive behaviours were more likely to be obsessive, anxious and depressed. In a study comparing individuals with anxiety and mood disorders with control group, the former were more likely to utilise maladaptive emotion regulation strategies such as avoidance or

suppressive behaviour when viewing an emotion provoking film (Campbell-Sills & Barlow, 2007). People with panic disorders also used both expressive suppression and experiential avoidance in response to the carbon dioxide challenge which uses carbon dioxide enriched air to induce panic sensations (Levitt, Brown, Orsillo, & Barlow, 2004).

The maladaptive nature of expressive suppression for healthy adults and those with psychopathology has shown that suppression paradoxically increases negative emotion in both healthy people (Gross & John, 2003) and in people with anxiety (Amstadter, 2008). This goes against the aim of emotion regulation which is to decrease negative emotional experience (Sloan, 2004). Expressive suppression can be seen to be maladaptive because it does not decrease negative feelings but increases physiological arousal. The habitual use of suppression can also have interpersonal consequences as it can decrease closeness with others (Gross & John, 2003).

Whilst experiential avoidance can involve distraction, at its core, it is the unwillingness to experience private events such as problematic thoughts, feelings and sensations and thus deliberate efforts are made to control or escape from them (Hayes, 2004; Hayes & Wilson, 1993). This is an unwillingness to sit with one's own private experiences without trying to alter it in anyway. Experiential avoidance becomes a disordered process when one applies it rigidly and without any sense of flexibility so that it requires enormous time, effort and energy in order to control or be in struggle with the unwanted private experiences.

1.6. Rationale for targeting experiential avoidance and suppression

A number of studies over the last thirty years have shown that pushing away a thought out of consciousness can potentially bring it back with a vengeance (Abramowitz, Tolin & Street, 2001). This was first demonstrated by Wegner, Schneider, Carter and White (1987) when they asked participants not to think about a white bear for five minutes and then for the next

five minutes to think about a white bear. Throughout the experiment, the participants had to verbalise whatever thoughts they were having and each time they thought of a white bear they had to ring a bell. Those in the suppression first condition reported twice as often thoughts of a white bear which was because the very act of trying to suppress it made it more intrusive. This finding was tested to be robust and the phenomenon was known as the post suppression rebound effect (Abramowitz et al., 2001). Petrie, Booth and Pennebaker (1998) also found that emotionally laden thoughts were particularly vulnerable to the rebound effect during a task which required participants to write about an emotional or non emotional daily event. The emotional events were found to be the hardest to suppress. Trinder and Salkobski (1994) also asked people to monitor intrusive thoughts over four days and compared to control group, participants who tried to suppress negative intrusive thoughts found it more uncomfortable and experienced more of the thoughts they were trying to suppress which supported the claim that suppression likely leads to the rebound effect in the long run. Thought suppression in substance cravings were also implicated in increased cravings for the substance (Wenzlaff & Wegner, 2000). Intrusive memories have also been found to increase when emotionally suppressed and suppressing depressive moods have also been shown to increase feelings of pain. Marcks and Woods (2005) therefore also made the suggestion for acceptance based models of treatment as its recommendation.

The reason for this suppression rebound effect has been explained to lie within the ironic processes theory which argues that post suppression rebound is not a random part of the process of suppression but an integral part of it (Wegner, 1994). Wegner argued that when one suppresses a thought, they have to distract themselves intentionally into doing something else and the mind then starts a unconscious monitoring process to ensure that the task is being followed and working effectively. When the person stops consciously trying to suppress however, the unconscious process carries on monitoring this process and checking whether

the thing that is to be suppressed is in fact being suppressed. This leads to anything that resembles the object of suppression to trigger the thought again and cause a vicious cycle. This therefore suggests that actively trying to manage your mind in avoiding unwanted private experiences leads to a process that increases the intrusive thoughts rather than if they were just accepted as thoughts without judgement.

Inspired by the work of Wegner and colleagues, further focus was put onto researching the management strategies for worrisome thoughts and unwanted intrusive cognitions. It was found that certain strategies maintained intrusive and unwanted thoughts in psychological disorders (Salkovskis, 1989; Wegner, 1989). This was found to be in the case in a number of disorders including acute stress disorder (Harvey & Bryant, 1998), post traumatic stress disorder (Shepherd, Stein, & Milne, 2000) and obsessive compulsive disorder (Salkovskis, Richards, & Forrester, 1995).

People with insomnia complain often of intrusive thoughts and worries (Harvey & Payne, 2002; Berkovec, 1982) or a racing mind (Harvey, 2001; Geer & Katkin, 1966) whilst trying to sleep. It has been reported that cognitive arousal is 10 times more likely than somatic arousal to be cited by insomniacs as the main cause of their sleeping problems (Lichstein & Rosenthal, 1990). In fact, on the sleep disturbance questionnaire, the item “my mind keeps turning this over” and “I am unable to empty my mind were the most highly endorsed of the 12 rated items and a principal component analysis led to the extraction of the factor “mental anxiety” which accounted for 40% of the variance (Espie, Brookes, & Lindsay, 1989).

High positive correlations have also been reported between measures of pre-sleep cognitive activity and sleep onset latency (Nicassio, Mendlowitz, Fussell, & Petras, 1985; Van Egeren, Haynes, Franzen, & Hamilton, 1983). Watts, Coyle, and East (1994) also reported that the content of pre sleep activity could fit into categories which were trivial topics, thoughts about

sleep family and long term concerns, positive concerns and plans, preoccupation with bodily sensations and work and recent concerns. It can therefore be seen that the majority of the cognitive activity categorised can be seen as negatively toned and centres on concerns and problems. Thought control strategies used in the sleep period can therefore positively or negatively affect the outcome of sleep through either fuelling or extinguishing pre sleep cognition (Warda & Bryant, 1998; Wells & Davies, 1994). It is therefore possible that when anxious thoughts or worries related to poor sleep or its consequences are suppressed it leads to increased physiological arousal which is not conducive to sleep.

As reported in the previous sections, thought suppression fuels cognitive activity (Salkovskis & Campbell, 1994; Wegner et al., 1987). Further support comes from insomniacs often complaining of unwanted intrusive pre-sleep cognitive activity (Espie et al., 1989, Lichstein & Rosenthal, 1980). Harvey (2001) also found that insomniacs rated their sleep quality lower and also reported higher cognitive activity compared to good sleepers similar to previous research by Borkovec (1982) and Lichstein and Rosenthal (1980). Reducing experiential avoidance thus can potentially facilitate a person into not distinguishing between unwanted and wanted pre-sleep cognitive activity but rather to focus on observing the activity without struggle, knowing that it is cognitive activity rather than a confirmed outcome.

1.7. Locating ACT and CBT into the literature of emotional regulation

As seen in the previous section, both ACT and CBT can be located within the larger context of the emotion regulation literature. Emotions can be either regulated by manipulating the evaluation of the external or internal emotion cues, known as antecedent focused emotion regulation and is largely seen in CBT or it can be regulated by manipulating emotional responses, known as response focused emotion regulation. The two main strategies studied in the literature are reappraisal which is a core component of CBT and Suppression which is a core target of reduction in ACT. Both CBT and ACT encourage adaptive emotion regulation

but target different stages of the generative emotion process with CBT promoting adaptive antecedent focused emotion regulation strategies whilst the acceptance strategies of ACT counteract the maladaptive response focused emotion regulation strategies such as suppression.

There are also fundamental differences in the philosophical foundations between the two models. Dalrymple et al. (2010), Hofmann and Asmundson (2008) and Ong et al. (2012) have all have highlighted the possibility of using acceptance and mindfulness techniques alongside CBT and have shown support in increasing adherence to rituals that promote sleep or to restructure the content of the fears that people have regarding insomnia. To combine CBT with ACT however would reinforce the idea that it is actually necessary to change the content of private experiences and that the content is something to be feared in the first place just because it creates internal discomfort.

ACT and CBT also differ in how they deal with cognitions as ACT does not utilise a tripartite model which distinguishes between overt behaviours (Actions), emotions (subjective experiences) and cognitions (thought processes) as in CBT. Instead, ACT subsumes them all under the term private events as a "term for all forms of psychological activity, both public and private, including cognition" (Hayes et al., 2006, p2). Cognitions therefore refer to a thought process in CBT and private behaviours in ACT.

ACT primarily focuses on changing the function of cognitions rather than the cognitive content and these cognitive functions are targeted by ACT through encouraging patients not to act on the negative cognitions but to accept them without attempting to change their actual content. This is used for unpleasant emotions such as anxiety and fear, which has been implicated in poor sleep.

Since emotional disorders such as anxiety disorders and depression are also proposed to be characterised by ineffective emotion regulation, avoidance behaviours are a key DSM criteria for anxiety disorders (DSM-V, 2013). Effective psychological treatments for emotional disorders can therefore potentially focus on promoting the use of beneficial emotion regulation strategies over the use of ineffective strategies.

ACT targets experiential avoidance and attempts to manage unpleasant emotions through reducing suppression through interventions such as mindfulness whereas CBT primarily focuses on the emotion eliciting stimulus itself, changing the situation before it generates the emotional response. ACT counter acts maladaptive response focused emotion regulation strategies whereas CBT promotes adaptive antecedent focused emotion regulation strategies by encouraging cognitive reappraisal of the emotional triggers.

1.7.1. Summary

As stated, both the CBT and ACT models can be understood under literature of emotion regulation. Gross's (1998) process model of emotions, which emphasises the evaluation of external or internal emotion cues, sheds light on how CBT has helped those with insomnia but also how ACT can do the same and potentially in a more efficient way.

Once external or internal emotional cues are processed, it sets into motion a set of experiential, physiological and behavioural responses that are activated and influenced by emotion regulation tendencies. The time point at which individuals engage in emotion regulation influences the efficacy of their regulatory efforts. Accordingly, based on their timing during the emotion generative process, emotion regulation strategies can be antecedent focused or response focused depending on whether the emotion has been elicited or not. Antecedent focused emotion regulation strategies occur before the emotional response is fully activated. These strategies include situation modification, attention deployment and cognitive

reappraisal of the situation. Response focused emotion regulation strategies aim to alter the expression or experience of emotions after the response tendencies have been activated and include strategies such as suppression and avoidance. Empirical investigations have supported the use of antecedent focused strategies as being relatively effective methods of regulating emotions in the short term and argue against response focused strategies as they are seen as counterproductive (Gross, 1998; Gross & Levenson, 1997). ACT works on the pathway of response focused strategies but unlike suppression and avoidance, it works to decrease the suppression and avoidance that is present (Hofmann & Asmundson, 2008).

1.8. Investigating the role of sociability in the prediction of sleep quality

As seen in Harvey's (2002) and Morin et al.'s (20033) conceptualisation of insomnia, social factors plays a part in the onset and maintenance of insomnia as the lack of sleep increases the likelihood for a person to try to compensate for the loss of sleep and the consequent fatigue associated with sleep loss. These social factors may take the form of absences from work due to the fear of not being able to meet the challenges of dealing with the physical as well as emotional challenges of the work environment but also the relational challenges in maintaining social ties with friends, family, work colleagues, managers and bosses. The research on sociability and sleep has highlighted how the lack of sleep can impact negatively on sociability. After a poor night of sleep, both optimism and sociability was shown to decrease and would do so until resumption of normal sleep patterns (Mullington, Haack, Toth, Serrador, & Meier-Ewert, 2009). This therefore suggests that personality traits play a part in affecting the mood of people who have insomnia and impact on their engagement of with other people. Anxiety can be classified as a mood (Barlow, 2000) and mood plays an important role in several psychological conditions. A recent systematic analysis has suggested that greater sociability results in better overall health through improved mood and

therefore provides support for the link between sleep and social interactions (Beattie, Kyle, Espie & Biello, 2014).

Moturu et al.'s research (2011) captured observations of mood and sociability revealed that those who exhibited poor mood such as stress, anxiety, frustration and anger were significantly less sociable than those who exhibited good mood such as relaxation, calmness, happiness and contentment. Further analysis which used the amount of sleep obtained each night by participants instead of mood however found no significant correlations and the authors have argued that it was in line with their expectation that day to day variations in sleep are not affected by how sociable an individual is. This is in a different direction to the models proposed by Harvey (2002) and Morin (1993) who have claimed that the lack of sleep makes people less likely to be social as they are more tempted to cancel social obligations and events or miss work due to lack of sleep and fear of social consequences.

The study by Moturu et al. (2011) also found that a subject's sociability, which is a measure of how much social interaction they have, was predictive of the individuals who have the most significant correlation between sleep and mood on average. The more sociable of the subjects also exhibited better mood on average. The research is an interesting development considering the novelty of the data collection through smart phones which meant that the data collection was in real time rather than from memory.

An early study of chronic sleep restriction reported anecdotally of a couple who reported increase conflict towards the partner due to their fatigued state (Friedman, Brookes, Bliwise, Yesavage, & Wicks 1995). This decrease in sociability was also found in another study where under conditions of 55 hours of sleep deprivation, participants were significantly more likely to exhibit frustrated responses to hypothetical interpersonal situations involving others compared with baseline scores (Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore, 2006).

Haack and Mullington's (2005) study provided further suggestion for the role of sociability in their controlled laboratory study which investigated whether prolonged lack of sleep modified day to day as well as diurnal variations in mood and physical wellbeing. The study reported that when sleep was restricted to 50% of habitual time over 12 consecutive days, optimism-sociability progressively declined over consecutive days of sleep restriction by 15% whilst bodily discomfort also increased significantly by 3% across consecutive days. Resulting from the sleep restriction, significant increases of generalised body pain, back pain and stomach pain were reported. The findings therefore suggest that chronic sleep restriction may contribute towards the onset and amplification of pain and emotional affect through the reduction of optimistic outlook and psychosocial functioning.

The findings implications are useful as the laboratory conditions coupled with a control group means that there is weight to the argument that chronic insufficient sleep is causally involved in the lowering of psychosocial functioning and positive outlook. Optimism and sociability however have been shown to protect against stroke and cardiovascular disease (Kubzansky et al., 2001; Ostir, Markides, Peek, & Goodwin, 2001), increase efficiency in wound recovery (Ebrecht et al., 2004) and promotes resistance to infectious illnesses (Cohen, Doyle, Turner, Alper & Skoner, 2003).

It is important to note however that Haack and Mullington's study (2005) measured sociability through observing the distance between a research assistant who was seated on a couch in the laboratory, and the position where participants chose to sit in relation to the research assistant whilst they completed the questionnaires. Sitting further away was considered to be an indicator of decreased sociability, and it was found that sociability was reported to be higher for the sleep deprived group compared to the normal group. There are a number of potential explanations for this. One is that as a result of exposure (Zajonc, 1968). The deprived group interacted more closely with the research assistant compared to the

normal group who had less contact. The authors suggested also that it was possible that the deprived participants were unconsciously seeking social support to alleviate the stress of sleep deprivation (DeVries, Glasper, & Detillion, 2003; Uchino, Cacioppo, & Kiecolt-Glaser, 1996)

This is also worth considering however from the research already reviewed, people with insomnia tend to shy away from social contact after poor sleep therefore sociability may be a process that is also important in the model of explaining the maintenance of insomnia as it keeps a person focussed on their own internal state. The current study therefore aims to look at sociability as a social factor and its relationship to sleep quality. It can be seen that the ACT model does not explicitly reference social factors in the processes of increasing psychological flexibility therefore the current study aims to investigate whether sociability is a significant predictor of sleep quality after controlling for the six processes of ACT.

1.9. Purpose

The literature review thus far has shown that CBT for insomnia is the most effective evidenced based treatment however its effect sizes are lower compared to treatment for other disorders and also adherence to the behavioural interventions drop dramatically over time. ACT is therefore investigated as an alternative model to CBT-I in the treatment of insomnia. The literature covered in the previous sections has provided the justification for investigating the processes underlying ACT and how much it explains the variance in experiential avoidance as well as how experiential avoidance relates to sleep. The purpose of the current study is fourfold. First it aims to test how well the six processes underlying the ACT model taken as a whole can predict experiential avoidance. Second, it aims to test how predictive experiential avoidance is of sleep quality. Thirdly, the study aims to test whether experiential avoidance mediates the influence of anxiety sensitivity on sleep quality. Fourthly, it also aims to test the role of sociability in the prediction of sleep quality.

The current study aims to understand and predict sleep quality through the framework of Emotion Regulation alongside the theoretical underpinnings of the six processes of Acceptance and Commitment Therapy. ACT in general has been able to explain how avoidance of negative emotional stimuli leads to gradual reductions in well-being and is also associated with a number of psychological conditions however this link has not been extensively applied to insomnia. In order to continue to add to this knowledge base, the theory will be tested through four analyses, the first examined whether the six processes of ACT which are acceptance, cognitive defusion, self as context, being present, values and committed action, when taken as a whole, could explain the variance in experiential avoidance, as predicted by the ACT theory. It will achieve this by measuring each of the six processes to see the contribution of the six processes as a whole rather than the unique contribution of each process due to the overlapping nature of the processes. Each core process is measured by one or more of the scales used in the current study. Acceptance, cognitive defusion, being present and self as context is measured by the Freiburg Mindfulness Inventory. Values are measured by the Well-being factor in the Trait Emotion Intelligence Short Form Questionnaire and committed actions is measured by the Brief Cope's combined active coping and planning subscale scores. The second analysis tests whether experiential avoidance is a predictor of sleep quality as measured by the Pittsburgh Sleep Quality Index. The third analysis tests whether experiential avoidance mediates anxiety sensitivity in the prediction of sleep quality as measured by the Pittsburgh Sleep Quality Index. The fourth analysis tests whether sociability could significantly predict sleep quality when controlling for experiential avoidance.

The study intends to achieve the aims set out by answering the following research questions:

Question 1: Do the six processes of ACT taken as a whole predict experiential avoidance?

Question 2: How well can experiential avoidance predict poor sleep quality?

Question 3: Does experiential avoidance mediate anxiety sensitivity in the prediction of sleep quality?

Question 4: Does Sociability significantly predict sleep quality when controlling for experiential avoidance?

On the basis of the literature review in the previous section, the following hypotheses and alternative hypotheses will be tested for each of the hypotheses:

Hypothesis for question 1: Experiential avoidance will be significantly predicted by the following measures:

- Acceptance, cognitive defusion, being present and self as context: Low scores on the Freiburg Mindfulness Inventory indicating low levels of mindfulness. This is due to the first four processes of ACT having been defined as being the functional behavioural equivalent of mindfulness (Fletcher & Hayes, 2005).
- Values: low scores on the Trait Emotion Intelligence Questionnaire Short Form factor of wellbeing and therefore in accordance to the literature, not living a life that is in line with values.
- Committed actions: As the Brief Cope subscale of Active coping and planning is used to measure committed actions since no other tool was suitable at the time of the data collection, a two tailed hypothesis is used as whilst in ACT it can be argued that low levels of committed action should be predictive of experiential avoidance, the actual

measure of the brief cope items may measure committed action in a different way to how the ACT model intended. It was used in the current study as all six processes were required for testing the model.

Hypothesis for question 2: High experiential avoidance significantly predicts poor sleep quality

Hypothesis for question 3: Anxiety sensitivity as a global construct is either partially or fully mediated by experiential avoidance in the prediction of sleep quality.

Hypothesis for question 4: High sociability significantly predicts sleep quality when controlling for experiential avoidance.

Chapter 2: Methodology

2.1 Introduction

This chapter links the literature and theoretical reviews in the previous chapters and the research that has already been conducted. The research design and methodology, including the choice of measures in testing the hypotheses are explained within. The chapter also considers ethical considerations and procedures conducted. The study aimed to test the whether the six theoretical processes of ACT, taken as a whole, significantly predicted experiential avoidance. It also tests whether experiential avoidance was a predictor of sleep quality and also whether experiential avoidance mediated fully or partially anxiety sensitivity in the prediction of sleep quality. Finally, it tests whether Sociability adds to the predictive power in sleep quality after controlling for experiential avoidance. Quantitative methodology was employed in the form of questionnaires which measured experiential avoidance, anxiety sensitivity, mindfulness, active coping and planning, which was conceptualised as committed action in the current study, and wellbeing which was conceptualised as values.

2.2 Ethical Clearance

Before the study commenced, ethical approval was obtained from the University of Roehampton (details attached in appendix 1). The British Psychological Society's code of human research ethics (2010) were abided by in the present study. This included following the principles of respect for autonomy, dignity of persons, scientific value of the research project, social responsibility and maximising benefit whilst minimising harm.

Recruiting participants from the internet and social media can be described as being Internet mediated research (IMR). The British Psychological Society (2013) released ethical guidelines for internet mediated research and these guidelines were followed in order to ensure correct conduct was in place during the research process. These guidelines included

issues over confidentiality, degree of control over the research environment and informed consent guidelines.

One of the key issues is confidentiality and this was addressed by not collecting any personal or identity revealing information of the participant apart from their name when they complete the questionnaire. Demographics such as age and gender were also collected but as the surveys were all based on likert scales and the data being quantitative, participants cannot be identified by their responses.

2.2.1 Ethical precautions

All informed consent forms were encrypted and stored securely on a password protected hard drive and participants were all assigned a unique identification number that was used for the purposes of this research project. This unique identification number was not linked to any personal identifiable details of the participant to ensure anonymity.

Both raw and processed data were stored on a password protected external hard drive and will be kept for duration of ten years in compliance with University research policies. This will ensure that only authorised people can view the data.

In the event that the participant had wanted to withdraw their data, the participant just had to provide their unique identification number until a stated cut off point where data would have been fully anonymized. The mechanisms deployed were in accordance to current data protection legislation.

2.3 Participants

As the study was an online study whereby participants were recruited from various social media related websites, sometimes participants did not complete the questionnaire or they encounter computer problems or accidently closed their browsers whilst participating. As a

result, participants who did not complete every questionnaire in the study were removed completely which meant that out of 601 participants, we used a total of 327 participants for the final analyses. All participants were required to have fluency in the English language due to the questionnaires being validated in English. Those who did not feel they were fluent in English and confirmed so in the online questionnaire were directed to a page thanking them for their time but that they were not able to participate in the study.

The 327 participants' ages ranged from 18 to over 65 in age, 21.7% of the participants were aged between 18 and 24, 28.7% of the participants were aged between 25 to 34, 19% of the participants were aged between 35 to 44, 21.7% of the participants were aged between 45 to 54, 8.6% of the participants were aged between 55 to 64 and 0.3% of the participants were aged 65 or over. The gender distribution of the participants was 21.7% (71) male and 78% (255) female, 1 participant did not disclose their gender (0.3%).

2.4 Measures

The following five questionnaires were used in order to measure the concepts outlined in the literature review and hypotheses. Experiential avoidance was measured by the Acceptance and Action II questionnaire; anxiety sensitivity was measured by the Anxiety Sensitivity Index; the six processes of the ACT model are acceptance, cognitive defusion, self as context, being present, values and committed action. The first four processes were measured by The Freiburg Mindfulness Inventory as the first four processes are seen as the functional behavioural equivalent of mindfulness (Fletcher & Hayes, 2005). Values were measured by the TEIQUE SF Well-being factor score as it is defined as "reflecting a generalised sense of well-being, extending from past achievements to future expectations. Overall, individuals with high scores feel positive, happy, and fulfilled. In contrast, individuals with low scores tend to have low self-regard and to be disappointed about their life as it is at present" (Petrides, 2001). Committed action was measured by the combined score from the subscales

of active coping and planning in the Brief Cope. Finally, Sleep quality was measured by the Pittsburgh Sleep Quality Index.

2.4.1 Acceptance and Action II questionnaire (AAQ-II; Bond et al., 2011)

The Acceptance and Action II questionnaire measures experiential avoidance. Items on the AAQ II assess tendencies of individuals in making negative evaluations of private events, the unwillingness to be present with negative private events and the drive to control or alter the form of these negative private events. The scale consists of 7 items which are statements which must be rated on a 7 point likert scale ranging from 1 (never true) to 7 (always true). Examples of statements include: “My painful memories prevent me from having a fulfilling life.” and “I’m afraid of my feelings”. Higher scores indicate greater experiential avoidance. This scale is an improvement on the previous scale which was already well established in clinical and non-clinical samples (Feldner, Zvolensky, Eifert, & Spira, 2003; Hayes et al., 2004; Karekla, Forsyth, & Kelly, 2004) however it has been shown to be even more psychometrically consistent (Bond et al., 2011). A mean Cronbach’s Alpha coefficient across six reported studies was .84 (ranging from .78 and .88). In the current study, the Cronbach’s alpha coefficient was .936.

2.4.2 Anxiety sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally 1986)

The ASI is a 16 item self report questionnaire that assesses the respondent’s fear of anxiety sensations such as rapid heartbeat, and nausea, based upon the belief that the symptoms had negative consequences such as embarrassment, mental incapacitation and physical illness. Each item describes fear about bodily sensations or the consequences of anxiety and respondents indicate the degree they either agree or disagree with each item on a Likert type scale from 0 (very little) to 4 (very much). The sixteen items provide a global score for anxiety sensitivity as well as sub scores for physical concerns, mental concerns and social concerns related to anxiety. Examples of some of the items include: “It scares me when I feel

‘shaky’ (trembling)”, “When I am nervous, I worry that I might be mentally ill” and “It is important for me not to appear nervous”. The ASI possesses excellent internal consistency and good test-retest reliability for up to three years and total scores on this index are higher among patients with anxiety disorders or alcohol use disorders (Peterson and Reiss, 1992). The Cronbach’s Alpha coefficient of the ASI in this study was .928

2.4.3 Brief Cope (Carver, 1997)

The Brief Cope is a self-report questionnaire that assesses a number of different coping behaviours and thoughts a person may have in response to stressful situation. It comprises of 14 subscales which are: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion and self-blame. Twenty-eight items make up this questionnaire, 2 items measure each subscale and are rated on a 4 point likert scale from 1 (“I haven’t been doing this at all”) to 4 (“I’ve been doing this alot”). The 14 subscales can be used individually or combined into two aggregate scores, emotional focused coping style and problem focused coping style. In this study, the subscales of active coping and planning were combined to form the concept of committed action. Items that measured active coping were: “I've been concentrating my efforts on doing something about the situation I'm in.” and “I've been taking action to try to make the situation better”. Items that measured planning were: “I've been trying to come up with a strategy about what to do” and “I've been thinking hard about what steps to take”. The Internal reliability for the 14 subscales ranged from Cronbach’s Alpha coefficient .568 to .941 which is similar to that of Carver (1997). The Cronbach’s Alpha for active coping was .794 and .804 for planning.

2.4.4 Trait emotion intelligence questionnaire short form (Petrides & Furnham, 2001)

This is a 30 item scale designed to measure the global trait emotional intelligence of a person. Two items from each of the 15 subscales for the full Trait Emotional Intelligence questionnaire has been selected to form this shortened scale and the subscales have good internal consistency as well as broad coverage of the sampling domain of the construct. The subscales allows for four factors to be derived which are well-being, self control, emotionality and sociability. The reason that this scale was utilised was that it measured two factors which are well-being, which has been used in the current study as a measure of the ACT process of values, and sociability which is investigated in order to whether it adds to the concept of experiential avoidance. All items are measured on a 7 point Likert scale from 1 (completely disagree) to 7 (completely agree). Examples of items that measured values were: "I generally don't find life enjoyable. (REVERSED SCORED)", "On the whole, I'm pleased with my life" and "I generally believe that things will work out fine in my life". Examples of items that measured sociability were: "I can deal effectively with people" and "I'm usually able to influence the way other people feel". Appendix 5 has the full list of items measuring both wellbeing and sociability. Cooper and Petrides (2010) produced findings that suggested the scale had good discrimination, threshold parameters, high item information values and that it showed very good precision across most of the latent trait range. They recommended that this short form of the TEIQUE to be used when rapid assessment of trait emotional intelligence was needed. The Cronbach's Alpha for the wellbeing factor was .889 and .779 for sociability.

2.4.5 Freiburg mindfulness inventory (Walach, Buchheld, Buttenmuller, Klienknect & Schmidt, 2005)

This scale measures the concept of mindfulness and has been validated and shown to be psychometrically sound with an internal consistency of Cronbach's alpha = .86. It has also been shown to be significant in correlations with relevant constructs such as self awareness, dissociation, global severity index and meditation experience in years which supports the construct validity of the scale. The scale has also been shown to be sensitive to change and usable with people without previous meditation experience or knowledge. The scale consists of 14 items which measure the construct of mindfulness and each statement is responded to on a likert scale from 1(rarely) to 4 (almost always). Examples of items on this scale are: "I pay attention to what's behind my actions", "I see my mistakes and difficulties without judging them" and "I accept unpleasant experiences". The Cronbach's alpha for this scale in the current study is .880.

2.4.6 Pittsburgh sleep quality index (PSQI; Buysse, Reynolds, Monk, Berman & Kupfer., 1989)

The PSQI is a 19 item questionnaire that provides seven component scores which measure the following: Duration of sleep, sleep disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, subjective sleep quality and need for medication in order to sleep. These seven components added together provide a global PSQI score indicating sleep quality. Each component is measured on a scale of 0 to 3. A global score of 5 or below indicates good sleep quality whilst a score of 6 or above indicate poor sleep quality with a maximum score of 21. The measurement possesses a Cronbach's alpha reliability coefficient of .83 and test-retest reliability of (r = 0.85). The measurement has sound psychometric properties (Buysse et al., 1989; Carpenter and Andrykowski, 1998) and can differentiate those with insomnia or

without with 90% sensitivity and 87% specificity. The Cronbach's Alpha for the current study is .73.

2.4.7 Demographic information

The age range and gender of the participants were collected. To maintain anonymity, an age range was used rather than an exact age.

2.5 Procedure/recruitment method

This study recruited from a convenience sample and advertised to people from a broad range of ages (18+) and from a wide range of backgrounds. The recruitment process used social media such as Facebook, Twitter as well as various forums and groups related to sleep and anxiety in order to disseminate the questionnaire. Examples of groups where this recruitment process took place include the Sleep School's Facebook page and the insomnia and anxiety community pages on Facebook.

The provided weblink connected to the Quatrics platform which is a private research software company which specialises in online data collection. The software is available for University of Roehampton staff and students.

Upon opening the weblink, each participant was first taken to an information page. Only by agreeing that they were aged 18 or above and that they were fluent in English were they then able to proceed to the actual surveys, if they disagreed to the information made known to them they were redirected to a page thanking them for their time. A participant consent form was the next page shown to participants. After they agreed and their name was collected as part of the informed consent, they were directed to the start of the questionnaires.

Upon completion of the questionnaires, general information about the purpose behind the study was given in the form of a debriefing sheet which included information on the

participant's right to withdraw their data up to a certain point in time. The anonymous nature of the data that they had provided was also highlighted. Information on support in terms of sleep or other difficulties which may or may not have arisen through completing this questionnaire was also provided and contact details to discuss any issues with the lead investigator were also shown.

2.6 Analyses

2.6.1 Procedure of handling missing data

In cases where participants had missing data, this was imputed by multiple imputation (Rubin, 2004). This method of imputation took into account the increased noise caused by imputation through averaging the outcomes across multiple imputed data sets. This allowed each imputed data set to be analysed separated and for the results to be averaged except for the standard error term (SE). The SE is constructed by the within variance of each data set as well as the variance between imputed items on each data set. The two variances can then be added together and the square root of them then determines the SE thereby allowing for the noise due to the imputation as well as the residual variance to be introduced to the regression model.

The data used for the current study is comprised of a dataset which has utilised multiple imputation and where the data was averaged across five multiple imputed data sets. The averages of the five multiple imputed data sets were utilised in the statistical analyses conducted in SPSS (V21). The statistical analyses were also conducted with the original data set which had all missing data cases removed and also when inputted by either Regression or Estimation Maximisation. The results were similar to the findings using the multiple imputation dataset.

2.6.2. Question 1: Statistical analyses for multiple regression:

A standard multiple regression analysis was conducted on SPSS for Windows (V 21) with the Acceptance and Action II score as the dependent variable and the Freiburg Mindfulness Inventory score, The TEIQUE SF wellbeing factor score and a combined score of the Brief Cope subscales of active coping and planning as independent variables. The Acceptance and Action II Score is a measure of experiential avoidance. The Freiburg Mindfulness Inventory Score is a measure of the first four processes of the ACT model which are acceptance, cognitive defusion, self as context and being present. The TEIQUE SF wellbeing factor score is a measure of values, which is the fifth process of the ACT model and finally the combined score from the Brief Cope subscales of active coping and planning can be conceptualised as a measure of the final ACT process which is committed action. The assumptions of multiple regression were evaluated and resulted in the removal of five outliers, which were multivariate outliers identified by a standard residual greater than 3 (a residual more than 3 standard deviations from the mean). Inspection of the residuals scatterplot indicated that assumptions of normality, linearity and homoscedasticity were met after the removal of the outliers.

2.6.3 Question 2: Statistical analyses for linear regression

A standard linear regression analysis was conducted on SPSS for Windows (V 21) with sleep quality as measured by the Pittsburgh Sleep Quality Index as the dependent variable and Acceptance and Action II score, which is a measure of experiential avoidance, as an independent variable. The assumptions of linear regression were evaluated and resulted in the removal of 4 outliers, all outliers were identified by a standard residual greater than 3 (a residual more than 3 standard deviations from the mean). Inspection of the residuals

scatterplot indicated that assumptions of normality, linearity and homoscedasticity were met after the removal of the outliers.

2.6.4. Question 3: Statistical analyses for mediation

Mediation steps with bootstrap and SPSS-macro as described by Preacher and Hayes (2008) was used to test the mediation of experiential avoidance on anxiety sensitivity. This technique is relatively robust against violations of normality and also has a priori power of .80 with medium effects at sample size larger than 70.

Mediation is assumed to be present when the experiential avoidance variable mediates the relationship between anxiety sensitivity and sleep quality. Four mediation steps therefore have to be fulfilled. 1. Anxiety sensitivity and experiential avoidance have to be significantly correlated. 2. Anxiety sensitivity has to significantly predict sleep quality. 3. Experiential avoidance has to significantly predict sleep quality. 4. When experiential avoidance is included in the bootstrap analyses, anxiety sensitivity explains sleep quality less accurately as compared to step 2. Either the beta decreases but remains significant (i.e. ‘partial mediation’) or the beta becomes non significant (i.e. ‘complete mediation').

Mediation steps 2, 3 and 4 are presented together. The expression ‘direct effect’ is used to indicate that anxiety sensitivity directly predicts sleep quality and that the Beta is not influenced by the inclusion of experiential avoidance in the analyses. (I.e. mediation in step 4 is not significant. The expression ‘indirect effect’ is used to indicate that anxiety sensitivity indirectly predicts sleep quality via partial or complete mediation of experiential avoidance (i.e. mediation in step 4 is significant). The word ‘effect’ without adjective indicates analyses between the variables of anxiety sensitivity and experiential avoidance, anxiety sensitivity and sleep quality or experiential avoidance and sleep quality in steps 1, 2 and 3.

Due to the restrictions of the applied SPSS-macro, step 1 is univariate whilst the other steps are multivariate. Linear regression analysis was used to calculate the standardized betas. Sizes of significant effects were described in Pearson's correlation coefficients, Cohen's d in case of comparing means (.02 is small, .50 is medium, .80 is large), and f2 in case of multiple regression (.02 is small, .15 is medium, .35 is large).

Mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008).

2.6.5. Question 4: Statistical analyses for hierarchical regression

A hierarchical regression analysis was conducted on SPSS for Windows (V 21) with sleep quality as measured by the Pittsburgh Sleep Quality Index as the dependent variable and the Acceptance and Action II Score as a measure of experiential avoidance as step one. In step two, the Sociability factor in the TEIQUE SF was imputed. The assumptions of Hierarchical regression were evaluated and resulted in the removal of four outliers, which were multivariate outliers identified by a standard residual greater than 3 (a residual more than 3 standard deviations from the mean). Inspection of the residuals scatterplot indicated that assumptions of normality, linearity and homoscedasticity were met after the removal of the outliers.

Chapter 3: Results

3.1. Introduction

Four sets of analysis were conducted to test the ACT model and its theory in relation to sleep quality. The first analysis investigated whether experiential avoidance would be significantly predicted by the six processes identified in the ACT model which were acceptance, cognitive defusion, self as context, being present, values and committed action. The second analysis investigated how well experiential avoidance predicted sleep quality. The third analysis investigated whether experiential avoidance mediated the relationship between anxiety sensitivity and sleep quality. The fourth analysis tested whether sociability significantly predicted sleep quality after controlling for experiential avoidance.

Table 1 shows the mean and psychosocial variables investigated. As can be seen, in the current study, the mean score for anxiety sensitivity was 20.98 (SD = 13.39) which was not near the scores for any anxiety disorders as seen in the study by Rodriguez, Bruce, Pagano, Spencer and Keller (2004). The mean score for experiential avoidance in this study was 22.9 (SD = 9.65). The average mean score in clinical populations is 28.3 (SD = 9.4) whilst in non clinical populations it was 18.51 (SD = 7.05). Scores that are greater than 24-28 are suggestive of probably current clinical distress, making future distress and work absence more likely (Bond et al., 2011). For the Freiburg mindfulness inventory, the mean score in the current study was 34.56 (SD = 7.99), similar to Wallach et al's study where the mean score was 37.24 (SD = 8.63). The mean score for the values in the current study was 30.24 (SD = 8.11) whilst for sociability it was 26.95 (SD = 6.71). In the TEIQUE, scores between 0-29 are seen as to be below average whilst scores from 30-69 were seen as average and scores from 70-99 were seen as above average (Petrides, 2001). The mean score for the sample in the current study for the PSQI however were higher than in the normal sample obtained by Buysse et al., (2008). The mean score for that sample was below a score of 5

which was indicative of good sleep quality. In the current study however, a mean score of 9.13 (SD = 3.41) was obtained. Obviously this means the global mean score in the current study was above the cut off score of five as recommended by Buysse et al., (1989). There may be a number of reasons for this. Firstly it should be noted that other published studies have also had higher mean scores above 5 in the recent years (Voss & Tuin, 2008; Tsai et al., 2005) however there may be several other explanations for the higher global mean scores. One potential explanation is that the original study by Buysse et al., (1989) was conducted over a quarter of a century ago and sleep quality in populations may have worsened over time (Ferrie, Kumari, Salo, Singh-Manoux, & Kivimaki, 2011; Bixler, 2009). Therefore the scores of the global PSQI may reflect worsening sleep patterns.

A second explanation could be due to how the PSQI was scored. As Buysse et al., (1989) did not clearly specify how to code sleep duration and sleep efficiency, a inconsistency to how it was coded could have meant that the a lower score on the item would result in a lower global PSQI score which was why a revised scoring method was introduced by Beck, Schwartz, Towsley, Dudley and Barsevick in 2004.

A third explanation could also be that the people who took part in the current study may have been interested in participating due to their poor sleep or was interested in the topic at hand more so than those with no sleep issues.

Table 1. Means and standard deviations of psychosocial variables.

	N	Mean	Std. Deviation
ASI Global Score	327	20.9847	13.39015
experiential avoidance	327	22.9823	9.65599
Mindfulness (Acceptance, cognitive defusion, being present and self as context)	327	34.5615	7.99100
TEIQUE SF SOCIABILITY	327	26.9566	6.71204
Values	327	30.2434	8.11817
committed action	327	10.7969	3.18387
PSQI TOTAL SCORE	327	9.1376	3.41362
Valid N (listwise)	327		

3. 2 Question 1: Standard Multiple regression analysis on predictors of experiential avoidance

Table 2 shows the correlations between experiential avoidance, mindfulness, values and the combined score from the Brief Cope subscales of active coping and planning which is conceptualised as committed action. It can be seen that all independent variables correlate significantly with the dependent variable. Intercorrelations between the independent variables are all significant or highly significant apart from between committed action and values.

Table 2: Correlations between experiential avoidance, mindfulness, values and the combined score of the Brief Cope subscales of active coping and planning (committed action).

	Experiential Avoidance	Mindfulness	Values	Committed action
Experiential Avoidance	1.000			
Mindfulness	-.637***	1.000		
Values	-.774***	.711***	1.000	
Committed action	.125*[]	.145**[]	.098[]	1.000[]

Note *p<0.05 **p<.01 ***p<0.001

[] denotes two tailed significance

Table 3 shows the standardized regression coefficients (β), associated t statistics and probabilities. Multiple R for the regression was .813 which is significantly different from zero ($F(3,318) = 206.812$, $p<.0005$). The predictor variables accounted for 65.8% of the variance when adjusted for overestimation due to the small sample size. The unadjusted variance estimate was 66.1%. It can be seen that mindfulness which is utilised in the current study as a measure of the first four processes of the ACT model and values which is the measure of the fifth process of the ACT model and committed action which is the measure of the sixth process of the ACT model all uniquely contribute to predicting the variance in experiential avoidance. This indicates that taken as a whole, the six processes outlined by the ACT model can significantly account for the variance in experiential avoidance ($p<.0005$). The direction of the correlation between committed action and experiential avoidance was not the direction as predicted by ACT which was a possibility that was anticipated for due to the Brief Cope subscales of active coping and planning, which could be termed as committed action, seemingly measuring the concept not as intended by the ACT Model.

Table 3. Standard multiple regression of predictors of experiential avoidance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	B		
(Constant)	46.734	1.769		26.424	.000
Mindfulness	-.249	.058	-.21	-4.298	.000
Values	-.744	.055	-.65	-13.631	.000
Committed action	.649	.101	.22	6.425	.000

a. Dependent Variable: experiential avoidance

$R=.813$, $F(3,318) = 206.812$, $p<.0005$
$R^2=.661$
Adj. $R^2=.658$

3.2 Question 2: Standard linear regression analysis of experiential avoidance as a predictor of sleep quality

Table 4 shows the standardized regression coefficients (β), associated t statistics and probabilities. Multiple R for the regression was .65 which is significantly different from zero ($F(1,322) = 236.02$, $p<.0005$). The predictor variable of experiential avoidance accounted for 42.1% of the variance when adjusted for overestimation due to the small sample size. The unadjusted variance estimate was 42.2%. The regression equation was: predicted sleep quality = 3.863 + 0.226 x (experiential avoidance score).

Table 4. Standard linear regression of predictor of sleep quality

Model	Unstandardized Coefficients		T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
(Constant)	3.863	.402	9.605	.000	3.068	4.658
Experiential Avoidance	.226	.015	14.638	.000	.196	.257

a. Dependent Variable: PSQI TOTALSCORE (Sleep Quality)

R=.650, $F(1,322) = 236.02$, $p<.0005$
R^2=.422
Adj. R^2=.421

3.3. Question 3: Mediation analysis: Does experiential avoidance mediate anxiety sensitivity in the prediction of sleep quality?

As seen in table 5, the correlation between experiential avoidance and the global score of the anxiety sensitivity index is statistically significant which fulfils step one of mediation.

Table 5. Pearson's correlation between anxiety sensitivity index global score and experiential avoidance score.

	Acceptance and Action II (Experiential Avoidance score)
Anxiety Sensitivity Index Global score	.69***
Note *p<0.05 **p<.01 ***p<0.001	

3.3. 1. Mediation Analysis: Experiential avoidance as a mediator of anxiety sensitivity (Global Score) in the prediction of sleep quality

Four mediation steps were used to investigate whether anxiety sensitivity predicted sleep quality and whether this was mediated by experiential avoidance.

Step 1 is presented in table 1

Step 1 (Anxiety sensitivity and experiential avoidance): High anxiety sensitivity correlated with high experiential avoidance (Pearson's R= .69, p = <0.01)) and the effect size was large (B = .50, t (325) = 17.32, p = .001).

Step 2 (Anxiety sensitivity and sleep quality): High anxiety sensitivity significantly predicted poor sleep quality (B = .12, t (325) = 10.40, p = .001). Effect size was nearly medium.

Step 3 (Experiential avoidance and sleep quality): High experiential avoidance predicted poor sleep quality (B = .19, t (325) = 9.42, p = .001). Effect size was medium.

Step 4 (Experiential avoidance mediating anxiety and sleep quality): Via the mediation of experiential avoidance, high anxiety sensitivity no longer significantly predicted poor sleep quality (B = .02, t (325) = 1.93, p = .06). Effect size became much reduced to nearly no effect.

Summary: Results of the mediation analysis confirmed the mediating role of high experiential avoidance in the relationship between high anxiety sensitivity and poor sleep quality (B = .10; CI = .07 to .12). High anxiety sensitivity directly predicted poor sleep quality but can be seen to be completely mediated by high experiential avoidance. Figure 1 displays the results.

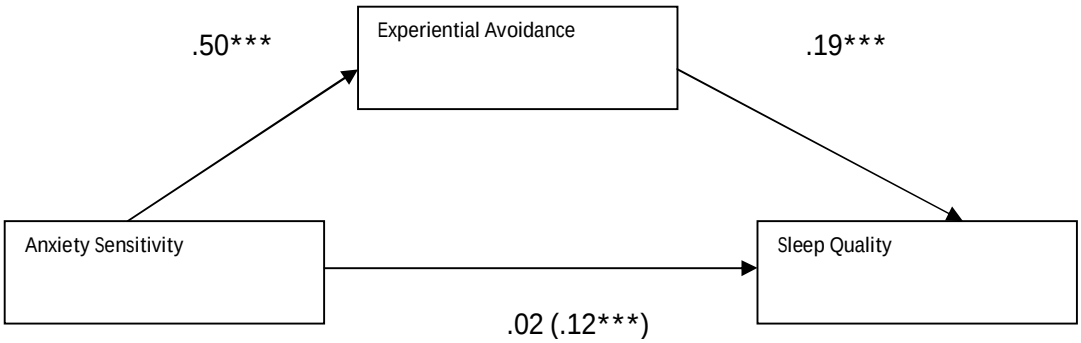

Figure 1. Indirect effect of anxiety sensitivity on sleep quality through experiential avoidance

Note *p<0.05 **p<.01 ***p<0.001

3.4. Question 4: Standard hierarchical multiple regression analysis of sociability as a predictor of sleep quality after controlling for experiential avoidance

A hierarchical multiple regression analysis was conducted to determine if the addition of Sociability improved the prediction of sleep quality over and above experiential avoidance alone. See Table 6 for full details on each regression model. The full model of experiential avoidance and Sociability to predict sleep quality was statistically significant, $R^2 = .428$, $F(2, 321) = 120.229$, $p < .0005$; adjusted $R^2 = .424$. The addition of Sociability to the prediction of sleep quality did not lead to a statistically significant increase in R^2.

Table 6 shows the standardized regression coefficients (β), associated t statistics and probabilities.

Table 6. Standard Hierarchical Multiple Regression Analysis predicting sleep quality from experiential avoidance and sociability

Model		Unstandardized Coefficients		T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error			Lower Bound	Upper Bound
1	(Constant)	3.816	.405	9.418	.000	3.014	4.617
	Experiential Avoidance	.229	.016	14.614	.000	.198	.259
2	(Constant)	4.449	1.037	4.291	.000	2.407	6.491
	Experiential Avoidance	.222	.018	12.228	.000	.186	.258
	Sociability	-.018	.028	-.646	.519	-.073	.037

a. Dependent Variable: PSQITOTALSCORE (Sleep Quality)

MODEL 1: R=.653, F(1,322) = 234.09, p<.0005
R2=.426
Adj. R2=.424

MODEL 2: R=.654, F(2,321) = 120.23, p<.0005
R^2=.428
Adj. R^2=.424

Chapter 4: Discussion

4.1 Introduction

Insomnia is prevalent and a common cause of absenteeism and illness which has negative impacts on both physiological and economical levels (Leger et al., 2002; Drake, Roehrs, & Roth, 2003). A number of different methods have been utilised over the years to combat this. These methods included pharmacological interventions such as hypnotics and herbal remedies as well as non pharmacological interventions such as behavioural therapy and cognitive therapy. Behavioural therapy and cognitive therapy would later be combined to form cognitive behavioural therapy. Treatment using non pharmacological methods has been shown to be just as effective over time as pharmacological ones but without the adverse side effects and ability to treat chronic insomnia. Its effect sizes have ranged from small to large however compared with other disorders such as depression or anxiety, they have generally been smaller (Hoffman et al., 2012).

The theoretical assumptions of ACT has suggested that potentially the behavioural changes which aim to reduce physiological arousal and the need to control for insomnia through various mental and behavioural practices may actually exacerbate the problem. The ACT model and its theoretical underpinnings were thus applied to insomnia. The theory is well defined, empirically testable and also considers the mechanism of anxiety sensitivity and experiential avoidance in explaining poor sleep generally and specifically for people who suffer from insomnia which does not have a physical cause.

The current study aimed to understand and predict sleep quality through the framework of Emotion Regulation alongside the theoretical underpinnings of the six processes of Acceptance and Commitment Therapy. ACT in general has been able to explain how avoidance of negative emotional stimuli leads to gradual reductions in well-being and is also associated with a number of psychological conditions. This link however has not been

extensively applied to insomnia. In order to continue to add to this knowledge base, the theory was tested through four analyses, the first examined whether the six processes of ACT, which are acceptance, cognitive defusion, self as context, being present, values and committed action could explain the variance in experiential avoidance, as predicted by the ACT theory. The second analysis tested whether experiential avoidance was a predictor of sleep quality as measured by the Pittsburgh Sleep Quality Index. The third analysis tested whether experiential avoidance mediated anxiety sensitivity in the prediction of sleep quality as measured by the Pittsburgh sleep quality index. The fourth analysis tested whether sociability could significantly predict sleep quality when controlling for experiential avoidance.

Specifically it was hypothesised that in line with the ACT model of psychological suffering, those at the greatest risk of poor sleep were those who scored highly on anxiety sensitivity and would have the following in comparison to those who scored lowly on anxiety:

- Mindfulness: Lower scores on the Freiburg Mindfulness Inventory which would suggest lower levels of acceptance, cognitive defusion, self as context and being present as mindfulness is seen as the functional behavioural equivalent of the first four processes of the ACT model (Fletcher & Hayes, 2005). Lower scores would indicate that they are unable or unwilling to be present with any thought, feeling or sensation that arises and to acknowledge and accept them as they are hence the sensitivity and aversion to anxiety.
- TEIQUE SF Well-being Factor: Lower scores which would reflect low self regard and disappointment in regards to their life at present (Petrides, 2001) and would therefore reflect whether a person was living a life in line with their values.

- committed actions: As the Brief Cope subscale of Active coping and planning is used to measure committed actions since no other tool was suitable at the time of the data collection, a two tailed hypothesis is used as whilst in ACT it can be argued that low levels of committed action were predictive of experiential avoidance, the actual measure of the brief cope items may measure committed action in a different way to how the ACT model intended.

The low scores on these six processes would suggest that a person would score highly on experiential avoidance and thus be more likely to try to avoid negative thoughts, feelings and emotions. As a result of this, if experiential avoidance is controlled for, then anxiety sensitivity should no longer be predictive of sleep quality.

Since these four analyses were conducted in the current study in order to test the hypotheses. Each of the four questions will be discussed in turn.

4.2. Question one: Do the six processes of ACT which are acceptance, cognitive defusion, self as context, being present, values and committed action significantly predict experiential avoidance?

The results from the standard multiple regression model showed that the ACT model was strongly supported in predicting the variance in experiential avoidance as a whole. The six processes explained a significant amount of variance in experiential avoidance. The multiple regression analysis conducted showed that the significant predictors were all highly significant ($p = < 0.005$) and explained 65.8% of the variance explained by the model.

In order to develop predictive assessment tools and effective interventions to reduce insomnia, this study suggested that the ACT model of psychological change, which fits into the

emotional regulation framework, has predictive value for the level of insomnia as measured by the AAQ II which measures experiential avoidance.

The hypothesis was tested by utilising scales which measured the six processes of the ACT model, namely acceptance, cognitive defusion, self as context, being present, values and committed action. The first four processes were measured by the Freiburg Mindfulness Inventory global score, values was measured by the TEIQUE SF Well-being factor score and committed action was measured by the aggregate score of the Brief Cope subscales of active coping and planning. It is important to note that the scales did not differentiate between the processes since the first four processes were measured by the FMI. The reason this decision was taken was due to the six processes which in the literature has been shown to overlap and are interrelated. Taken as a whole, each process supports the other and all work together to increase psychological flexibility (Hayes et al., 2006). As shown in the results, the six processes as measured by the scales utilised in the current study were able to predict a large degree of variance in experiential avoidance. Higher levels of experiential avoidance as reported by the AAQ II was shown by standard multiple regression to be predicted by low scores on the Freiburg Mindfulness Inventory which suggests low levels of acceptance, cognitive defusion, self as context and being present (Fletcher & Hayes, 2005), low scores on the TEIQUE SF Well-being factor would suggest low levels of living in line with values but as prepared for, higher scores of committed action. These variables were all in line with the hypothesis apart from the direction of committed action, which was different than what would be assumed by the ACT model. Since the variance explained by the full model was 65.8%, the ACT model's six processes when taken as a whole can therefore be seen as significant predictors of experiential avoidance, despite the direction of committed action, which was still a significant predictor of experiential avoidance as seen in the model.

As stated, the direction of committed action was different from what was expected by the ACT model. It was assumed that higher levels of committed action would be associated with lower levels of experiential avoidance however the results actually showed that higher levels of committed action was in fact associated with higher levels of experiential avoidance. One potential explanation may be that the two Brief Cope measures of active coping and planning, which was conceptualised as committed action may instead measure the concept differently than in the ACT model and therefore an alternative scale should be used for future studies.

As argued in the literature review, insomnia is worsened when there is a conscious effort to sleep (Espie, 2002). The four items on the brief cope which make up the concept of committed action can be seen as follows: "I've been concentrating my efforts on doing something about the situation I'm in", "I've been taking action to try to make the situation better", "I've been trying to come up with a strategy about what to do" and "I've been thinking hard about what steps to take". It may be possible that rather than measuring committed action as intended by the ACT model, the scale actually measured the lack of acceptance of insomnia and the struggle to rid poor sleep because of the discomfort it causes. So if the situation is about trying to sleep better, higher levels of active coping and planning would actually make sense in exacerbating experiential avoidance since the committed action is not to necessarily a move towards values but rather to solve the issue of not getting enough sleep through various control strategies or rituals. As the findings do show that it was a significant predictor, it can be possible to understand the direction as being, people who utilise active coping extensively and plan a lot, do so in order to avoid feelings, similar to suppression. By utilising active coping and planning, they are able to avoid their feelings and to not be in the present moment. If this is true, then people who score highly on these two measures are unlikely to stay with their feelings and develop aversion to them in the form of anxiety. This is also striking in that the correlation between committed action and values is

non-significant which suggests the actions are not in the movement towards meaningful values but rather towards ridding unwanted negative emotions.

Low well-being as measured by the TEIQUE SF was the strongest predictor of experiential avoidance and this is highly consistent with previous research examining the link between the trait emotional intelligence factors and its association with psychological disorders (Werner & Gross, 2009). The presence of low well-being as being predictive of experiential avoidance makes sense as low well-being has been defined as having low self regard and being dissatisfied with life in general whereas high well-being is characterised by positivity and fulfilment.

Ong et al. (2012) recommended the cultivation of acceptance, whereby one's internal reactions which includes thoughts, feelings, impulses and sensations, is able to be observed without resisting or acting upon them so that they can come and go without the need for control or avoidance. This cultivation of acceptance is proposed to be through the practice of mindfulness so as to increase one's ability to not reject their inner experiences. Their reconceptualisation makes sense however as predicted by the ACT Model, the remaining processes of ACT such as values and Committed action also has a part to play in the management of sleep quality. Ong et al.'s model does not take this into account and the current study has shown the utility of these two processes that have not been considered. The current study is also able to test the assumptions proposed by Ong and Colleagues (2012) and the research data had provided support for their conceptualisation whereby mindfulness and acceptance strategies can help to improve insomnia but also adds in the importance of values as proposed by the ACT model. Unfortunately as committed actions was in the opposite direction of the hypothesis, it is not possible to suggest that committed actions was a significant process which means that future studies would need a better measure.

To conclude, five of the six processes of the ACT model have been shown to be significantly predictive of experiential avoidance and higher levels of experiential avoidance have been shown to be associated with poorer sleep. Whilst it can be argued that all six processes overlap and can be taken as a whole (Hayes et al., 2006), further research will need to be done utilising more valid scale to measure committed action.

4.3 Question two: How well can experiential avoidance predict poor sleep quality?

The results from the standard linear regression showed that experiential avoidance significantly predicted sleep quality. Higher scores on experiential avoidance significantly predicted higher scores on the Pittsburgh Sleep Quality Index which indicates poorer sleep quality. The model explained 42.1% of the variance. As shown in the literature review, CBT in the treatment of insomnia has had lower effect sizes compared to its treatment success in other disorders (Hoffman et al., 2012). The linear regression model in predicting for sleep quality for the present study produced an effect size of 0.65 which can be deemed a large effect size which is defined as being above 0.5.

Compared to Espie et al. (1989), who found that "mental anxiety" accounted for 40% of the variance in sleep quality, the ACT model in the current study showed that experiential avoidance accounted for 42.1% of the variance. This suggests that reduction of experiential avoidance can potentially reduce the stress caused by poor sleep quality as it may reduce the amplification of the negative mood state already experienced (Hayes et al., 2006). In ACT, high experiential avoidance leads to long term desired qualities of life being placed aside in the pursuit of attaining the short term relief that comes from avoiding negative stimuli. In Espie et al. (1989) study, high levels of "mental anxiety" predicted poor sleep and in this current study, high levels of experiential avoidance predicted poor sleep. This suggests there may be some mediation between the two. The linear regression model into sleep quality

provided support for this as experiential avoidance was highly significant as a predictor of poor sleep quality.

As stated in the ACT model (Hayes et al., 2006), there are two types of pain, one is the clean pain that occurs when negative things occur, the other is the dirty pain that refuses to acknowledge and accept the pain that is already there and thus causes more pain as a result. Experiential avoidance can be seen as a measure of dirty pain which is marked by avoidance through suppression or denial. According to the ACT model (Hayes et al., 2006), everyone can at some point experience anxiety, but how one manages it is an altogether different matter. How one sees the anxiety also influences how willing they are able to sit with anxiety and not try to suppress it. ACT therefore could teach individuals skills and educate them to the normality of aversive thoughts, feelings and emotions and that feeling the emotion is not the same as acting it out impulsively. If this is indeed the case, the findings could support the notion that poor sleep quality is initiated and maintained as a result of dispositional factors such as sensitivity to anxiety coupled with refusal to experience them in the present moment which leads to various avoidance strategies which ultimately lead to worsened sleep over time.

Experiential avoidance can thus potentially explain why insomnia can strike suddenly for an individual as certain dispositions towards anxiety sensitivity are triggered when negative events occurs which then leads to an individual to try to control the situation mentally and to avoid them. This may provide initial relief at the cost of constant vigilance. This can therefore occur when certain events have caused them to lose sleep. The fear of this pattern repeating and coupled with the fear of not being able to cope can be understood by the transactional theory of stress which evaluates the lack of sleep as being harmful or as a threat and leads to various actions or behavioural changes which were intended to suppress the emotional stimuli (Ong et al., 2012).

In summary, the findings through the analyses can support the assumptions of the ACT model, which is theorised to work on a different pathway to CBT as explained in the framework of emotional regulation, and has utility in predicting sleep quality in the current study. As shown in the findings, people who were prone to experiential avoidance could be distinguished by lower scores on mindfulness as measured by the Freiburg Mindfulness Inventory which suggests lower levels of acceptance, cognitive defusion, self as context and being present. They were also distinguished by having lower levels of well-being which suggests they were not living in line with their values. Committed action which was obtained by the combining of the Brief Cope sub-scores of active coping and planning however, showed a slight positive relationship with experiential avoidance as previously discussed in the last section.

4.4. Question three: Does experiential avoidance mediate anxiety sensitivity in the prediction of sleep quality?

The hypothesis was that poor sleepers would be characterised by greater levels of anxiety sensitivity. Kashdan et al. (2006) demonstrated that a number coping strategies such as cognitive reappraisal, maladaptive coping, emotional responses and controllability showed that each one was either fully or partially mediated by the AAQ. In the current study, it was shown that anxiety sensitivity was fully mediated by experiential avoidance. Suppression which is a type of experiential avoidance can thus have interpersonal consequences in that it can decrease closeness with others which means that there are social consequences to the use of suppression. As people are said to be stuck in a cycle of insomnia where they are unable to view the problem from an objective perspective, meta cognitive awareness which is cultivated through mindfulness should help them shift towards an objective perspective and reduce experiential avoidance.

The results shows a association between anxiety sensitivity, experiential avoidance and sleep quality with anxiety sensitivity and experiential avoidance being predictive of sleep quality and experiential avoidance fully mediating the relationship between high anxiety sensitivity in the prediction of poor sleep quality. The findings fit well also with the suppression effect of emotional stimuli (Wegner et al., 1987).

4.5 Question four: Does sociability significantly predict sleep quality after controlling for experiential avoidance?

The exploration of sociability was a innovative component to the current study as the literature had associated sociability with sleep quality and also the models of CBT proposed by Harvey (2002) and Morin (1993) both highlight the role of social factors which play a part in people avoiding social events and developing safety behaviours. As the ACT model does not explicitly include social factors, it was tested in the current study to see whether it would be a significant predictor of sleep quality after controlling for the six processes in the ACT model. Sociability was measured by the TEIQUE Short form and operationalised as follows:

The sociability factor differs from the emotionality factor above in that it emphasises social relationships and social influence. The focus is on the individual as an agent in different social contexts rather than on personal relationships with family and close friends. Individuals with high scores on the sociability factor are better at social interaction. They believe they have good listening skills and can communicate clearly and confidently with people from very diverse backgrounds. Those with low scores believe they are unable to affect others' emotions and are less likely to be good negotiators or networkers. They are unsure what to do or say in social situations and, as a result, they often appear shy and reserved (Petrides, 2001).

As can be seen in the operationalised definition the current study's measure of sociability is based upon a person's confidence in dealing with relationships which can potentially explain why people may be more likely to adopt safety behaviours or to avoid work or social events in the event of the lack of sleep. The results however showed that sociability did not add to the variance explained by experiential avoidance which suggests that the ACT model implicitly takes into account social factors already under its six processes.

It could be hypothesised that sociability could provide a person with confidence to cope in daily social interactions even when having poor sleep quality and not feeling optimal. This confidence may protect them from using safety behaviours that try to reduce anxiety and instead allow them to face the day despite their lack of sleep.

4.6. Recommendations for counselling

The current study's findings provide further support for the work done by the ACT community which offers a differing view of psychological disorders which are caused by maladaptive coping styles in the hope of avoiding negative stimuli. Recent research has shown that people would rather be given electric shocks than to be alone with their thoughts (Wilson et al., 2014) and the rise of prescription drugs for insomnia as well as use of substances such as alcohol and drugs to escape from daily life suggests that the belief in the need to rid negative stimulus lies in not being able to be present with feelings which cannot technically cause harm. The harm is theorised to come from the loss in vitality and ability to continue with life in meaningful ways as energy has been exhausted in trying to rid oneself of the negative stimuli rather than to be able to not struggle with them and continue towards valued goals (Hayes et al., 2006).

Applying the ACT model to insomnia could potentially lessen the stressors on insomniacs in the long term. However, it is a long term lifestyle change rather than a magic pill. This can

teach the person to also become more resilient as they are taught that their emotions are just emotions and not reality (Hayes et al., 2006). Therefore stressors can be observed without the need to act on the emotions it provokes or to compensate for them as in the case of insomnia where the lack of sleep makes one believe they are unable to cope the next day and creates stress and physiological arousal, which reduces the ability to sleep (Harvey, 2002; Harvey, 2003).

This is also an interesting time for ACT as there have currently been attempts to move CBT towards group therapy formats as well as to introduce brief CBT interventions due to costs. ACT may therefore potentially have an advantage over CBT as shown in a study which compared ACT and CBT in the treatment of common afflictions such as depression, interpersonal relationships and sleep problems. It was shown that even with less training given to trainee therapists, clients showed better outcomes compared to CBT (Lappalainen et al., 2007). Of course these findings need to be carefully considered as the sample size is quite small and also it is a preliminary study.

Hertenstein et al., (2014) is an even more recent study which has shown the potential for ACT in treating primary insomnia. In particular, it looked at using ACT with non responders to Cognitive Behaviourial Therapy for primary insomnia. It was one of the first scientific evaluations of ACT in patients with primary insomnia and showed that quality of life could improve even without significant changes in objective total sleep time. Unfortunately, the study also lacked a control group and comprised of a small sample. The study could also have been improved if the sleep and quality of life of the participants were systematically evaluated before and after previous treatment with CBT-I. Overall, the study added to the literature in suggesting ACT as a promising treatment for non responders to CBT-I or as an alternative to CBT-I in the first place.

4.7. Recommendations for research

The study gives good support for the rationale as to why intervention studies should be carried out using the ACT model on insomnia. Currently, CBT is the approach of choice however it could be argued that certain strategies adopted such as sleep hygiene may actually increase the likelihood of insomnia in the long term if it works to suppress the automaticity of sleep, which as reported by good sleepers is that they do not need any rituals in order to sleep (Espie, 2002). The interventions that the ACT model proposes would in effect aim to tackle experiential avoidance whilst helping the person understand their anxiety better so as to know that anxiety is not pathological but a way of the protection by the mind (Hayes et al., 2006). By tackling these methods it could takes away the struggle with needing to have perfect sleep and improve their quality of life (Hertenstein et al., 2014). Building up a persons' level of mindfulness, which is one of the key interventions in ACT, would also in theory help with reducing the experiential avoidance as it is seen as the functional behavioural equivalent of the first four processes of the ACT model. Previous studies have already shown the benefits of mindfulness practice and in ACT it is used as a way of connecting a person with their inner world in an observational non judgemental way (Ong et al., 2012).

The difference between CBT and ACT is that they work on different levels, CBT works on reappraising negative stimuli to becoming more realistic whilst ACT works on increasing the resilience of the individual by helping them learn that they do not need to suppress or avoid negative stimuli. Based on the emotional regulation framework these can be seen as CBT being antecedent focused whilst ACT is response focused and aimed at preventing suppression. As seen in the literature, the effect sizes for CBT-I is smaller than for other disorders (Hoffman et al., 2012) and also seen is that adherence to behavioural changes such as sleep hygiene tend to tail off after a year with people reverting back to old practices which maintained their insomnia (Harvey, 2002).

Further research using ACT as a treatment for insomnia would shed further light as to whether this may be a equally effective or even superior treatment approach. Hertenstein et al. (2014) was one of the first to do this through a scientific evaluation but more research is required to build up support for ACT as a treatment for Insomnia. ACT has grown steadily over the years and continues to publish research showing efficacy in new areas including eating disorders (Cowdrey & Park., 2012) and smoking cessation (Hernández-López, Luciano, Bricker, Roales-Nieto, & Montesinos, 2009), both of which can also be argued to be linked to strategies of suppression of negative stimuli.

The distress of suffering from insomnia has been shown to lead to absenteeism, illness, economic loss and other negative outcomes and is also linked to suicide risks as not sleeping can cause impulsive actions to be enacted (McCall & Black, 2013; McCall et al., 2010). The research on ACT and pain management also goes some way to support the use of ACT on improving sleep quality as it can teach poor sleepers how to learn to separate clean and dirty pain and know which one can be avoided through accepting the primary clean pain when experiencing poor sleep (McCracken, Williams, & Tang, 2011; Dahl & Lundgren, 2006).

Further questions were also raised since anxiety sensitivity was shown to be a predictor of sleep quality and was mediated by experiential avoidance. As significant findings were found, it raises questions such as whether traits such as neuroticism (Ormel et al., 2013) would play a part as a personality disposition similar to anxiety sensitivity and further research could investigate these concepts in relation to insomnia to see if the constructs are similar or whether one subsumes the other (Van de Laar, Verbeek, Pevernagie, Aldenkamp, & Overeem, 2010; LeBlanc et al., 2007).

There are a number of future research directions as a result of the findings from this study. These include the use of longitudinal intervention studies and gold standard randomised

control trials in the treatment of insomnia with other treatments such as CBT-I being used as comparisons. The goal ultimately is for randomised control trials to be conducted whereby eligible participants are randomly assigned to one of three groups, the ACT treatment group, the CBT-I treatment group and a control group with no intervention. Of course, the control group would be offered ACT or CBT-I after the trial is complete due to ethical reasons. It is also a potential direction to investigate moderator variables such as age, sex and race so as to shed further light on the relationship between anxiety sensitivity, experiential avoidance and Sociability on sleep quality.

Similarly, mediator variables can also be tested in intervention studies to validate the assumed causality between the psychosocial variables investigated in this present study. Ultimately, future studies based on the findings of this study will look at incorporating gold standard randomised control trials with a comparison group using CBT and a control group compared to ACT. This will allow a clearer picture of the effect sizes involved in the treatments and also their efficacy compared to each other. As it has been shown in meta-analyses (Powers et al.,2009), ACT has been superior to all control conditions apart from in treating distress problems where it was as effective as CBT and CT but not more so. This has been argued not to be a weakness and may be explained by the idea that ACT works on different processes compared to CBT and CT and thus the pathways to change are different. As recommended by Powers et al. (2009) further studies are required so that ACT can be compared empirically with supported treatments for specific DSM disorders before it can be recommended for widespread application. This study therefore serves as the opening to the path that leads to this destination due to the lack of research into the area between ACT and insomnia.

4.8. Methodological limitations

The present study looked at the relationship between anxiety sensitivity and experiential avoidance and its relationship to sleep quality. However it needs to be said that this was an exploratory study into these variables. Demographics were therefore not a main concern in the present study but needs to be addressed in the future. Age is also another factor that needs to be further investigated and actual ages may be worth investigating rather than age ranges as used in the present study. A good sample size was collected for the current study however the gender ratio was not balanced with more females completing the online survey compared to males. The distribution of age ranges however was quite balanced.

The study also only recruited participants who confirmed that they had a fluent grasp of English which meant non English speaking participants were excluded from the study. Future research could look at different populations and countries as well as clinical and general populations to see if the results are replicable. There is already a wide range of translations available for a number of the scales used therefore this would not be hard to implement for future studies.

It is also with regret that due to time and motivation considerations in the participation of online studies, full versions of scales were not used which would have provided more detailed information on the measures used. Out of pragmaticism, the shortened versions of scales were used when available and choice of measures were also considered with brevity as being a priority in this current study.

Anxiety sensitivity, especially in regards to mental concerns is consistently identified in the literature as a key factor in preventing sleep (Harvey, 2002; Lundh, 2005). One limitation of the Anxiety Sensitivity Index that was used in the current study is that whilst it has been used in a lot of previous research, more up to date versions of the scale are now available which

has increased factor stability and whereby 6 items make up each of the subscale unlike at present where it is much more unevenly distributed. It may be that this could have an influence on the findings as the newer versions may be more sensitive in measurement. It would be worth future studies employing this new version of the ASI as well as also looking at the possibility of other anxiety scales such as the Beck Anxiety Inventory (Beck, Epstein, Brown & Steer, 1988) or Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995) which may shed further light into the relationship of anxiety and experiential avoidance. The Beck Anxiety Inventory for example includes a behavioural component which is not found in the Anxiety Sensitivity Index and may expose the ways the ways people with high anxiety may behave in maladaptive ways. The Depression Anxiety and Stress scale is also potentially useful in contributing to further findings as it was developed in order to "further the process of defining, understanding, and measuring the ubiquitous and clinically significant emotional states usually described as depression, anxiety and stress".

Furthermore, it should be noted that the scales used to measure the six processes should be evaluated in the future to assess whether new scales were available to ensure that the six processes were tested adequately. Mindfulness, which has been conceptualised as a measure of the first four processes of the ACT model, can also be tested to see if longer versions of mindfulness scales which measures different subscales rather than a overall score as in the Freiburg Mindfulness Inventory may allow future studies to disentangle the four processes which have been combined in the current study so as to shed further light on the individual contributions of each of the four processes of acceptance, cognitive defusion, self as context and being present.

Values as measured by the TEIQUE SF Well-being factor could also be improved by using the original version of the TEIQUE rather than the short form version utilised in the current study for pragmatic reasons. Normally, the TEIQUE SF provides a global EI trait score but

the current study followed the instructions from Petrides (2006) in deriving the factor scores from the short form version of the TEIQUE in order to measure values. The measure of committed action could also be replaced by the dedicated scale recently published known as the Committed Action Questionnaire (CAQ, McCracken, 2013) or even measured as a combination alongside values with the Engaged Living Scale (ELS, Trompetter et al., 2013) if further research supports their validity.

Another limitation relates to the theoretical nature of the study. As the study utilised self report instruments to measure anxiety sensitivity, experiential avoidance, mindfulness, values, committed action, sociability and sleep quality, the results may have subjective biases and where possible future studies should strive to implement more objective measures and where possible in laboratory settings.

Due to the nature of the self report instruments, it was also found that there was a high dropout rate for participants as out of the 601 participants who started the questionnaire, only 327 completed to the end of the survey. There could be a number of reasons for this, one is that due to the nature of using Qualtrics, if the participant accidently closes their browser or presses the back key on their phone browser it would exit them from the questionnaire. A second reason may be related to the length of the questionnaire as longer questionnaires. As a number of measures were used, participants may have become distracted or had other tasks to complete and thus did not complete since the longer the survey takes to complete, the higher the likelihood of non completion (Galesik & Bosnjak, 2009). Attempts to mitigate this were through the use of shortened forms of the measures used when possible.

There were also limitations to the sample in that it was cross sectional in design and participant's data was only recorded once and their sleep quality was measured in that prior month through the PSQI only. Finally, it is important to note that the mediation analyses

conducted in this study was based on correlations rather than causal relationships. This means that it is assumed that there is causality in that anxiety sensitivity predicts sleep quality but is mediated by Experiential Avoidance. Whilst this is justified due to the explorative nature of the study, it is of utmost importance that future studies are conducted via trials in order for the causal relationships to be validated such as in the case of intervention studies which manipulate the variables of interest and is able to see if such manipulations lead to differences in outcome. To improve on the few studies that have utilised ACT as previously mentioned such as Hertenstein et al. (2014) and Lappalainen et al. (2007) which has shown support for ACT's efficacy, a larger sample plus control groups are necessary. At the same time both clinical and non clinical samples should be investigated.

In summary, some of the measures used in the current study could be re-evaluated for future studies as longer versions or newly published scales may reveal more data to the processes of the ACT model. The current study, out of pragmaticism, utilised shorten versions when possible due to the research that has shown the measures being valid alternatives. It is also important for the assumed causal relationships in the current study to be validated in future studies as well as to seek to implement more objective sleep measures of the psychosocial variables under study.

4.9. Conclusion

This study investigated the utility of the ACT model of psychological suffering in the prediction of sleep quality and found that the link between anxiety sensitivity and sleep quality was fully mediated by experiential avoidance. The study was an online study which invited participants to complete a number of measures including the Anxiety Sensitivity Index, the Acceptance and Action Questionnaire II, the Brief Cope, the TEIQUE Short Form, the Freiburg Mindfulness Inventory and the Pittsburgh Sleep Quality Index. This is the first time that data had been published on the relationship of these variables with previous

research being mainly theoretical (lundh, 2005; Ong et al., 2012). The data supported the principles in ACT as being predictive of sleep quality and multiple regression models showed that the experiential avoidance accounted for 42.1 % of the variance in sleep quality whilst the six processes of ACT accounted for 65.8% of the variance in experiential avoidance.

The findings provide support for the link between anxiety sensitivity, experiential avoidance and sleep quality. It showed that high levels anxiety sensitivity was associated with poor sleep. When mediated by experiential avoidance, the c prime path became non significant, which suggested full mediation. The findings overall support the hypotheses of the ACT model and looks to have applicability in the prediction of sleep quality in a general population. Future studies using specific populations and different languages will be able to confirm or disconfirm the findings in this present study. Clinical populations of people with insomnia would also further contribute to the literature.

The exploration of sociability in relation to experiential avoidance showed that it was not significant predictor of sleep quality after controlling for experiential avoidance. It may therefore be possible that sociability is accounted for implicitly in the ACT model as the variance explained by the sociability measure did not add to the variance explained in the model. Further research however would be needed to explore this further.

The ACT model is supported as a basis for intervention. Through its processes to reduce experiential avoidance and movement towards values and committed action it can potentially reduce insomnia or break the cycle of maintenance. The interventions can be disseminated through individual therapy, group therapy or workshops and the strategies can then be evaluated in relation to the effect it has on reducing insomnia. Longitudinal studies incorporating interventions can also be used to monitor the changes and efficacy of this treatment approach. Further research may also explore the use of different scales to some of

the ones utilised in the study such as the newer versions of the Anxiety Sensitivity Index and also the unabridged version of the TEIQUE and COPE to increase support for the validity of this study but ultimately the findings here support the justification of introducing pilot studies or intervention studies incorporating ACT in the treatment of insomnia with the gold standard randomised control trial methodology being implemented over time if support is found.

As recommended by the Sleep Matters report (2011), it is important for GPs who are often the first person in the health care system to hear about sleep problems to be aware of the non pharmacological interventions most shown to be evidence based. CBT is currently the evidence based recommendation but as shown by the effect sizes compared to treatment of other disorders, ACT is worth further investigation into its applicability to the treatment of insomnia as the ACT model in the current study has shown potential benefits as an alternative to CBT. Whilst no causation can be inferred, the variables under study are strongly predictive of sleep quality. This paves the way for future studies which aims to investigate the causality of the variables of interest and whether manipulation of the variables does indeed affect sleep quality.

Chapter 5: Reflexitivity

Reflexivity is a process of self reference that examines the way in which research outcomes are affected by the researcher's biography and the research process (Davies, 2008).

Nightingale and Cromby (1999) described Reflexivity as requiring an:

> Awareness of the researcher's contribution to the construction of meanings throughout the research process, and an acknowledgment of the impossibility of remaining 'outside of' one's subject matter while conducting research. (p.228)

Personal reflexivity therefore encourages the exploration of:

> The ways in which our own values, experiences, interests, beliefs, political commitments, wider aims in life and social identities have shaped the research. It also involves thinking about how the research may have affected and possibly changed us, as people and as researchers (Willig, 2001: p.10).

In relation to the current study, it can be seen that my own interests led to the research topic. As the researcher, I am the primary instrument for data collection and data analysis since "Data are mediated through this human instrument, the researcher, rather than through some inanimate inventory, questionnaire, or computer" (Merriam, 1998: p.7) My research interest therefore can affect the research validity which "refers to the accuracy and trustworthiness of instruments, data, and findings in research" (Bernard, 1994: p.38).

Upon reflecting on my biography and beliefs I can see how it had led to the choice of research topic and the collection and analysis of data. In the following sections, I will expand upon this.

5.1. Choice of research topic

I first developed an interest into researching insomnia during my undergraduate studies as I was often prone to anxiety and would experience insomnia often. This meant that I would often sleep in after a poor night of sleep and then also find myself most alert during the late evenings. I wondered at the time whether this had anything to do with circadian typology or whether it was to do with sleep hygiene practices. The findings of my undergraduate study dissertation, which collected data from 294 participants was that sleep practices were much better at predicting sleep quality than whether a person was a Morning or Evening type person. The most significant predictors of sleep practices were overall sleep quality, use of sleep medication, worrying before bed and worrying during the day about sleeping and obtaining the same length of sleep each night. This therefore supports the notion that the way we think about our sleep was predictive of our sleep quality (Harvey, 2002).

The research however did not help with my sleep and I would continue to experience acute insomnia during times of stress or pressure. It probably also did not help that I was doing night shifts from time to time at a voluntary post whilst gaining experience to apply for the PsychD in Counselling Psychology. During this time when I was trying to attain as much experience as possible, I also extensively underwent training in various models of therapy so as to gain better understanding. One in particular that resonated with me strongly was perhaps unsurprisingly, Acceptance and Commitment Therapy. The model explained the futility of resisting negative thoughts and demonstrated this during the training with the concept of creative hopelessness which is where one would list all the possible ways they have attempted to avoid certain thoughts, emotions and experiences and then to rate how successful they have been. Ultimately this would show how it is not to do with effort or hard work in trying to resist these private experiences that made them go away, but rather this effort and hard work made them more intrusive.

As a result of this training, I learned to accept the presence of negative emotions such as anxiety whilst committing myself to behaviours that would move me towards my goals regardless of whether I would be successful or not. As a result of internalizing this, I became much more willing to accept the presence of negative emotions and also to challenge the notion that anxiety is bad or that they need to be avoided in order to have a good life. My conversations with people would inevitably bring up surprise as the concept of acceptance is often misunderstood as to mean submission and to give up fighting with negative emotions was perceived to be giving into these emotions.

When it came to deciding the research for my thesis, it began to make sense to focus on sleep as a research project considering my previous research into this subject and the fact trying to resist sleeplessness paradoxically increases wakefulness meant that this would be potentially be a good contribution to the field as even today, CBT continues to try to alter negative emotions into more realistic ones and also recommends techniques based on trying to control sleep rather than to allow it to happen automatically.

It therefore made sense for me to test these assumptions and investigate whether the theory proposed by ACT was supported by research, as it has done in a number of different conditions. Insomnia however has not received as much attention by the ACT model and therefore this study would hopefully promote further research into the area if the findings were supportive.

I knew that there was obviously a possibility that ACT could not account for sleep quality and was willing to report as such as I had done for my undergraduate studies in regards to circadian typology and sleep quality but also knew that if the findings were positive it would promote a different pathway in treating insomnia, which was described by Gross's research on emotion regulation. As the literature has shown, current best practices of CBT fits into the

antecedent focused approach of emotion regulation which aims to prevent the activation of emotions and has generally been proven to be effective. Response focused approaches on the other hand has been discouraged as it often takes the form of suppression which has been shown to have a number of negative effects on the individual and this fits well into the theory of insomnia proposed by theorists such as Alison Harvey, Colin Espie and Charles Morin. ACT however promotes the response focused approach pathway but rather than to suppress emotions when it arises it aims to prevent suppression so as to allow emotions to dissipate in its own time. This therefore seemed to be a novel way of approaching insomnia as rather than to try to chase good sleep, the goal was to allow sleep to become natural through reducing the pressure one places on the act of sleeping.

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Appendix

Appendix 1. Ethical Approval for Study

Ethics Application Ref: PSYC 13/ 085

Jan Harrison

Wed 06/11/2013 08:40

Inbox

To:

Cc:

Dear Alex,

Ethics Application

Applicant: **Alex Wai Ki Li**
Title: **The Relationship between Experiential Avoidance, Emotional Regulation Strategies, Anxiety Sensitivity and Coping Styles to Sleep Quality**
Reference: **PSYC 13/ 085**
Department: **Psychology**

Many thanks for your response and the final documents. I am pleased to confirm that all conditions for approval of this project have now been met. We do not require anything further in relation to this application.

Please advise us if there are any changes to the research during the life of the project. Minor changes can be advised using the Minor Amendments Form on the Ethics Website, but substantial changes may require a new application to be submitted.

Many thanks,

Jan

Jan Harrison
Ethics Officer - Research & Business Development Office
University of Roehampton | Froebel College | Roehampton Lane | London | SW15 5PJ

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Appendix 2: Information sheet

Study seeking participants to complete a series of questionnaires examining the Relationship between anxiety sensitivity, Experiential Avoidance and Sociability in Sleep Quality

*** Questionnaires can be completed online from your computer or smart phone***

WHO CAN PARTICIPATE

Adults 18 and over

People who are fluent in English

WHO CANNOT PARTICIPATE

People who are under 18 years of age

People who are not fluent in English

STUDY PROCEDURES

Participants will spend an average of 20-25 minutes completing the questionnaires. All instructions are given on the questionnaire pages. Please answer as honestly as possible and be reminded that your answers are anonymous and cannot be traced back to you

I thank you very much for your time in deciding to complete the questionnaires and like to now direct you towards the informed consent form which you have to sign before continuing. A Unique

Identification number will be generated which will allow you the anonymity in completing the questions and if you feel at any point you do not wish to answer a question you can skip it or if you decide to no longer participate, then contact us with your unique identification number for the data that you have submitted to be wiped.

LINK TO QUESTIONNAIRE

Thank you,

Alex Wai Ki Li

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lia@roehampton.ac.uk

+44 (0)7539 426256

Appendix 3. Participant Consent form:

ETHICS COMMITTEE

PARTICIPANT CONSENT FORM

Title of Research Project: The Relationship between anxiety sensitivity, Experiential Avoidance and Sociability in Sleep Quality

Brief Description of Research Project:

This study aims to explore the relationship between being unwilling to experience negative thoughts, feelings and/or physical sensations (experiential avoidance), sensitivity to anxiety and styles of coping and usage of emotional reappraisal and suppression as factors that influence sleep quality. Participants' names will NOT be used in this study. A unique code will be provided for each participant in order to make the research data completely anonymous.

Investigator Contact Details:

Alex Wai Ki Li

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Consent Statement:

I agree to take part in this research, and am aware that I am free to withdraw at any point. I understand that the information I provide will be treated in confidence by the investigator and that my identity will be protected in the publication of any findings.

Name …….

Signature ……

Date ……

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However, if you would like to contact an independent party please

contact the Head of Department (or if the researcher is a student you can also contact the Director of Studies.)

Director of Studies Contact Details:

Gina Pauli

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Head of Department Contact Details:

Diane Bray

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Appendix 4. Debriefing letter

Debriefing Letter

Study Title: The Relationship between anxiety sensitivity, Experiential Avoidance and Sociability in Sleep Quality

We greatly appreciate your participation in our study, and thank you for spending the time helping us with our research. When you began the study, you were told that this was a study exploring the relationship between experiential avoidance, emotional regulation strategies, anxiety sensitivity and coping styles to sleep quality. The study was interested in exploring whether there a relationship between the way people who are highly sensitive to anxiety were more likely to employ methods of emotional regulation and avoidance that would impact negatively on their sleep quality.

It was believed that poor sleepers are more likely to be highly anxious of the negative consequences of not getting a good night's sleep and this in term made them very susceptible to employing various methods that may in the short term increase their feeling of control in sleeping but ultimately makes them more susceptible to poor sleep and further discomfort through the ways they try to avoid the feelings that are invoked from the thought of the consequences of not getting a good night's rest.

If any of the questions or exercises in this study caused you to feel uncomfortable,

please feel free to contact Alex Wai Ki Li by email at lia@roehampton.ac.uk.

You can also contact my Director of Studies, Dr Gina Pauli, at r.pauli@roehampton.ac.uk

if you have concerns or comments resulting from your participation.

The information you provided will be kept confidential by not associating your name with the responses. The data will be stored with all identifying or potentially identifying information removed. Electronic data will be stored 10 years on a password protected external hard drive and then erased. Printed data will be kept in a locked room in 10 years then destroyed by confidential shredding. No one other than the researchers will have access to the data.

We really appreciate your participation, and hope that this has been an interesting experience for you.

Best wishes,

Alex Wai Ki Li

Appendix 5: Items on the TEIQUE-SF for Wellbeing (Values) and Sociability

Well being:

5, 20, 9, 24, 12, and 27

5. I generally don't find life enjoyable. (REVERSED SCORED)

20. On the whole, I'm pleased with my life

9. I feel that I have a number of good qualities.

24. I believe I'm full of personal strengths.

12. On the whole, I have a gloomy perspective on most things (REVERSED SCORED)

27. I generally believe that things will work out fine in my life.

Sociability:

6, 21, 10, 25, 11, and 26

6. I can deal effectively with people.

21. I would describe myself as a good negotiator.

10. I often find it difficult to stand up for my rights (REVERSED SCORED)

25. I tend to "back down" even if I know I'm right. (REVERSED SCORED)

11. I'm usually able to influence the way other people feel.

26. I don't seem to have any power at all over other people's feelings (REVERSED SCORED)

Appendix 6**:** Print out of Questionnaires used in the study (AAQ II, Brief Cope, TEIQUE SF, FMI, PSQI)

Confirming of age

Study seeking participants to complete a series of questionnaires examining the relationship between Experiential Avoidance, Emotional Regulation Strategies, Anxiety Sensitivity and Coping Styles to Sleep Quality

*** Questionnaires can be completed online from your computer or smart phone***

WHO CAN PARTICIPATE

People aged 18 and over

People who are fluent in English

WHO CANNOT PARTICIPATE

People who are under 18 years of age

People who are not fluent in English

I confirm that I am aged 18 or over and fluent in English

Yes ○ No ○

Participant Consent Form

PARTICIPANT CONSENT FORM

Title of Research Project:

The Relationship between Experiential Avoidance, Emotional Regulation Strategies, Anxiety Sensitivity and Coping Styles to Sleep Quality

Brief Description of Research Project:

This study aims to explore the relationship between being unwilling to experience negative thoughts, feelings and/or physical sensations (experiential avoidance), sensitivity to anxiety and styles of coping and usage of emotional reappraisal and suppression as factors that influence sleep quality. Participants' names will NOT be used in this study. A unique code will be provided for each participant in order to make the research data completely anonymous.

In this study, a online questionnaire will be completed. It will consist of a number of scales which explore the variables under study such as experiential avoidance, sensitivity to anxiety, styles of coping and usage of emotional reappraisal and suppression as well as quality of sleep. It should take 20 to 25 minutes to complete.

Participants are free to withdraw at any time but data may be used in a collated form after a certain time however anonymity remains due to the nature of the data collected.

Investigator Contact Details:

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Consent Statement:

I agree to take part in this research, and am aware that I am free to withdraw at any point. I understand that the information I provide will be treated in confidence by the investigator and that my identity will be protected in the publication of any findings.

Name

Signature (Please type your name)

Date (DD/MM/YYYY)

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However, if you would like to contact an independent party please contact the Head of Department (or if the researcher is a student you can also contact the Director of Studies).

Director of Studies Contact Details:

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Head of Department Contact Details:

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PLEASE PRINT THIS PAGE NOW - for your records

If you would like to participate in this study, please click the Yes button below.

Yes, I would like to participate	No, I would not like to participate
○	○

AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by selecting a number next to it. Use the scale below to make your choice.

1. My painful experiences and memories make it difficult for me to live a life that I would value.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

2. I'm afraid of my feelings.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

3. I worry about not being able to control my worries and feelings.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

4. My painful memories prevent me from having a fulfilling life.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

5. Emotions cause problems in my life.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

6. It seems like most people are handling their lives better than I am.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

7. Worries get in the way of my success.

- 1. Never True
- 2. Very Seldom True
- 3. Seldom True
- 4. Sometimes True
- 5. Frequently True
- 6. Almost Always True
- 7. Always True

Anxiety Sensitivity Index

Below you will find a list of statements. Please rate how true each statement is for you by selecting a number next to it. Use the scale below to make your choice.

1. It is important for me not to appear nervous.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

2. When I cannot keep my mind on a task, I worry that I might be going crazy.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

3. It scares me when I feel “shaky” (trembling).

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

4. It scares me when I feel faint.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

5. It is important to me to stay in control of my emotions.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

6. It scares me when my heart beats rapidly.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

7. It embarrasses me when my stomach growls.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

8. It scares me when I am nauseous.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

9. When I notice that my heart is beating rapidly, I worry that I might have had a heart attack.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

10. It scares me when I become short of breath.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

11. When my stomach is upset, I worry that I might be seriously ill.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

12. It scares me when I am unable to keep my mind on a task.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

13. Other people notice when I feel shaky.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

14. Unusual body sensations scare me.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

15. When I am nervous, I worry that I might be mentally ill.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

16. It scares me when I am nervous.

- 0. Very Little
- 1. A Little
- 2. Some
- 3. Much
- 4. Very Much

Brief COPE

These items deal with ways you've been coping with the stresses in your life. There are many ways to try to deal with problems. These items ask what you've been doing to cope when dealing with your stresses. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1. I've been turning to work or other activities to take my mind off things.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

2. I've been concentrating my efforts on doing something about the situation I'm in.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

3. I've been saying to myself "this isn't real".

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

4. I've been using alcohol or other drugs to make myself feel better

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

5. I've been getting emotional support from others.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

6. I've been giving up trying to deal with it.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

7. I've been taking action to try to make the situation better

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

8. I've been refusing to believe that it has happened.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

9. I've been saying things to let my unpleasant feelings escape.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

10. I've been getting help and advice from other people.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

11. I've been using alcohol or other drugs to help me get through it.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

12. I've been trying to see it in a different light, to make it seem more positive.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

13. I've been criticizing myself.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

14. I've been trying to come up with a strategy about what to do

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

15. I've been getting comfort and understanding from someone.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

16. I've been giving up the attempt to cope.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

17. I've been looking for something good in what is happening

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

18. I've been making jokes about it.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

20. I've been accepting the reality of the fact that it has happened.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

21. I've been expressing my negative feelings.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

22. I've been trying to find comfort in my religion or spiritual beliefs.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

23. I've been trying to get advice or help from other people about what to do.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

24. I've been learning to live with it.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

25. I've been thinking hard about what steps to take.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

26. I've been blaming myself for things that happened.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

27. I've been praying or meditating.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

28. I've been making fun of the situation.

- 1. I haven't been doing this at all
- 2. I've been doing this a little bit
- 3. I've been doing this a medium amount
- 4. I've been doing this a lot

TEIQue-SF

Instructions: Please answer each statement below by selecting the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers. There are seven possible responses to each statement ranging from 'Completely Disagree' (number 1) to 'Completely Agree' (number 7)

1. Expressing my emotions with words is not a problem for me.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

2. I often find it difficult to see things from another person's viewpoint.

1. Completely Disagree	2.	3.	4	5	6	7. Completely Agree
○	○	○	○	○	○	○

3. On the whole, I'm a highly motivated person.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

4. I usually find it difficult to regulate my emotions.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

5. I generally don't find life enjoyable.

1. Completely Disagree	2.	3	4	5	6	7. Completely Agree
○	○	○	○	○	○	○

6. I can deal effectively with people.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

7. I tend to change my mind frequently.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

8. Many times, I can't figure out what emotion I'm feeling.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

9. I feel that I have a number of good qualities.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

10. I often find it difficult to stand up for my rights.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

11. I'm usually able to influence the way other people feel.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

12. On the whole, I have a gloomy perspective on most things.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

13. Those close to me often complain that I don't treat them right.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

14. I often find it difficult to adjust my life according to the circumstances.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

15. On the whole, I'm able to deal with stress.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

16. I often find it difficult to show my affection to those close to me.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

17. I'm normally able to "get into someone's shoes" and experience their emotions.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

18. I normally find it difficult to keep myself motivated.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

19. I'm usually able to find ways to control my emotions when I want to.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

20. On the whole, I'm pleased with my life.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

21. I would describe myself as a good negotiator.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

22. I tend to get involved in things I later wish I could get out of.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

23. I often pause and think about my feelings.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

24. I believe I'm full of personal strengths.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

25. I tend to “back down” even if I know I’m right.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

26. I don’t seem to have any power at all over other people’s feelings.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

27. I generally believe that things will work out fine in my life.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

28. I find it difficult to bond well even with those close to me.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

29. Generally, I'm able to adapt to new environments.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

30. Others admire me for being relaxed.

1. Completely Disagree	2.	3.	4.	5.	6.	7. Completely Agree
○	○	○	○	○	○	○

Freiburg Mindfulness Inventory (FMI)

The purpose of this inventory is to characterize your experience of mindfulness. Please use the last 7 days as the time-frame to consider each item. Provide an answer the 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.

1. I am open to the experience of the present moment.

- ○ Rarely
- ○ Occasionally
- ○ Fairly often
- ○ Almost always

2. I sense my body, whether eating, cooking, cleaning or talking.

- Rarely
- Occasionally
- Fairly often
- Almost always

3. When I notice an absence of mind, I gently return to the experience of the here and now.

- Rarely
- Occasionally
- Fairly often
- Almost always

4. I am able to appreciate myself.

- Rarely
- Occasionally
- Fairly often
- Almost always

5. I pay attention to what's behind my actions.

- Rarely
- Occasionally
- Fairly often
- Almost always

6. I see my mistakes and difficulties without judging them.

- Rarely
- Occasionally
- Fairly often
- Almost always

7. I feel connected to my experience in the here-and-now.

- Rarely
- Occasionally
- Fairly often
- Almost always

8. I accept unpleasant experiences.

- Rarely
- Occasionally
- Fairly often
- Almost always

9. I am friendly to myself when things go wrong.

- Rarely
- Occasionally
- Fairly often
- Almost always

10. I watch my feelings without getting lost in them.

- Rarely
- Occasionally
- Fairly often
- Almost always

11. In difficult situations, I can pause without immediately reacting.

- Rarely
- Occasionally
- Fairly often
- Almost always

12. I experience moments of inner peace and ease, even when things get hectic and stressful.

- Rarely
- Occasionally
- Fairly often
- Almost always

13. I am impatient with myself and with others.

- Rarely
- Occasionally
- Fairly often
- Almost always

14. I am able to smile when I notice how I sometimes make life difficult.

- Rarely
- Occasionally
- Fairly often
- Almost always

PITTSBURGH SLEEP QUALITY INDEX

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night? (Hours)

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

3. During the past month, what time have you usually gotten up in the morning?

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed)

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you . . .

a) Cannot get to sleep within 30 minutes

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

b) Wake up in the middle of the night or early morning

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

c) Have to get up to use the bathroom

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

d) Cannot breathe comfortably

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

e) Cough or snore loudly

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

f) Feel too cold

- ○ Not during the past month
- ○ Less than once a week
- ○ Once or twice a week
- ○ Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

g) Feel too hot

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

h) Had bad dreams

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

i) Have pain

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

5. During the past month, how often have you had trouble sleeping because you . . .

j) Other reason(s), please describe

j1) How often during the past month have you had trouble sleeping because of this?

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

6. During the past month, how would you rate your sleep quality overall?

- Very good
- Fairly good
- Fairly bad
- Very bad

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all
- Only a very slight problem
- Somewhat of a problem
- A very big problem

10. Do you have a bed partner or room mate?

- ○ No bed partner or room mate
- ○ Partner/room mate in other room
- ○ Partner in same room, but not same bed
- ○ Partner in same bed

Demographics

What is your current age?

- ○ Under 18
- ○ 18 to 24
- ○ 25 to 34
- ○ 35 to 44
- ○ 45 to 54
- ○ 55 to 64
- ○ 65 or over

What is your gender?

- ○ Male
- ○ Female