

RUNNING HEAD: The Heart-Led Counselling Programme (HLC)

The Heart-Led Counselling Programme (HLC)

Developing a Programme to reduce anxiety, using Heart-led Interventions and Positive Psychology techniques in a counselling context.

By Laura Hancock

August 2021

8,800

RUNNING HEAD: The Heart-Led Counselling Programme (HLC)

Acknowledgments

I would like to express my sincere gratitude to my family and friends who have supported me throughout this wonderful journey – offering a large amount of patience and understanding. I would also like to give my wholehearted gratitude and great love to Sarah Monk, my supervisor, who has been instrumental in the progress of my research. She has been exceptionally kind, supportive and motivational. I would also like to thank the MAPP team at Bucks New University; the guidance, support and nature of the team has made a fundamental difference in my learning experience and given me the opportunity to explore topics that I am most passionate about. This project has been a significant experience in my professional and personal life – for that I will be forever grateful.

Contents Table

Page	Title
3	Abstract
4	Introduction
8	Chapter 1: The Power of Emotions and their Impact on Physiological and Psychological Coherence
12	Chapter 2: Methodological Approach
16	Chapter 3: The Associated Psychological and Physiological Effects of a Balanced Heart-brain Relationship
23	Chapter 4: Heart-led Interventions and their Effectiveness in Reducing Anxiety
32	Chapter 5: The Effective Use of Positive Psychology Interventions to Evoke Sustained Positive Emotional States and Aid Anxiety Reduction
42	Chapter 6: The Importance of a Therapeutic Delivery when Working with Heart-led Interventions
44	Chapter 7: Discussion of Findings
49	References
61	Appendix 1: PPI research studies: Cross-cultural
64	Appendix 2: The Formation of the Proposed HLC Programme
68	Appendix 3: The Proposed 12-Week Heart-Led Counselling (HLC) Programme: A Scalable Intervention Proposal

Abstract

The aim of this integrative literature review was to explore the current published research relating to certain mindful-based interventions and to determine their efficacy in helping relieve the symptoms of anxiety. The interventions of interest were Loving-Kindness Meditation and gratitude practices which are well-known Positive Psychology strategies, as well as three heart-led interventions from the HeartMath Institute. Three particular areas of interest were explored: literature pertaining to heart-brain coherence interventions and their potential for reducing anxiety symptoms; Positive Psychology interventions (Loving-Kindness Meditation and gratitude practices) and their anxiety reduction effects; and the role of the counselling environment in potentially amplifying the efficacy of both these types of intervention. The outcome of the research indicated that these interventions all have significant records of success in the treatment of anxiety and that the therapeutic relationship is potentially crucial to this success. The long-term purpose of this research is to justify the use of these interventions in a new programme of psychological treatment, the Heart-led Counselling (HLC) Programme to help patients who suffer from moderate anxiety.

Keywords: *Heart-brain coherence, loving-kindness meditation, gratitude practices, anxiety, Positive Psychology Interventions, positive emotion, counselling relationship.*

Introduction

Emotions are an integral part of all human thoughts, activities and endeavours. They are recognised as psychological states but also have biological origins that are associated with physiological changes in the body and the nervous system. Past research has assumed that emotions were crucial to the survival of our human ancestors and have been shaped by natural selection (Nesse, 1990). Interestingly, Darwin (1872) understood that the brain and heart were connected and that emotions could influence physiological states within the body. Emotions infuse the whole body with an orchestrated response that enables us to act appropriately (Steimer, 2002).

This explains why anxiety triggers, such as the emotion of fear, influence both the mind and body; emotions can activate a cascade of physiological changes via the autonomic nervous system (ANS) (Cohn & Fredrickson, 2009). There is abundant evidence that emotions alter the body's physiological systems (Fredrickson & Joiner, 2002; Isen, 1999). For example, a recent study by Reneau (2019) showed that patients feeling pain from fibromyalgia had reduced heart rate variability (HRV), reflecting decreased emotional adaptability and resistance to stress. This link between emotions and processes in the body showcases how the body responds holistically to a given emotional experience (Cohn & Fredrickson, 2009).

In addition, researchers have shown that the heart has a vital role in affecting emotional experience and regulating the nervous system (Armour, 2007; Bradley et al., 2007, 2010). This means that, when an individual suffers from anxiety, the associated negative emotions are **felt physiologically and psychologically within the body** (McCraty & Tomasino, 2006a). Immordino-Yang and Damasio (2007) have also shown that the brain and heart are interconnected and are greatly impacted by emotional processes.

The heart transmits complex patterns of neurological information (Appelhans & Luecken, 2006) to different parts of the brain. In simple terms, the response to negative and positive emotions is mediated between the heart and brain, which ultimately determines a person's emotional experience, psychologically and physiologically, and dictates the activation of either the parasympathetic or the sympathetic branch of the autonomic nervous system (ANS) (Rozman et al., 1998; Thayer & Lane, 2009).

Research from The HeartMath Institute (Childre & Martin, 2011; McCraty, 2015) has elucidated how the heart and brain can work together to achieve coherence, “a physiological correlate of physical and psychological health” (Burg et al., 2012, p. 135). These studies offer a profound understanding of how to gain coherence between the mind and body in order to recover from mental illnesses (Childre & Martin, 2011), including anxiety (Childre et al., 2016). They demonstrate links between emotional states and how the heart responds, through HRV, to positive or negative emotions (McCraty et al., 2003). This state of coherence (synchronisation) is associated with increased emotional stability and regulation.

Conversely, negative emotions that are felt, are characterised by a **desynchronised** biofeedback response from HRV (McCraty et al., 2003; McCraty & Childre, 2004). This activates a profound desynchronisation of the nervous system and the body (McCraty & Childre, 2010), causing imbalances and changes in the cardiovascular, hormonal, blood and bodily functions (Levenson, 1994). This renders the system **closed to connection and change** (Frijda, 1986), which leaves the person unable to connect with the body’s response (Dana & Porges, 2018).

Research from The HeartMath Institute and other sources (Dana & Porges, 2018; Fredrickson, 1998; McCraty, 2004; Trousselard et al., 2016) has shown that this **dysfunction** can be **reversed** through the use of positive emotions and heart-led interventions. These interventions offer mindful ways for a person to move into a state of **connection, recovery and synchronisation** (Childre & Martin, 1999). Essentially, when an individual connects with positive emotions through the use of heart-led interventions, this produces a balanced state of coherence and connection between the mind, body and ANS, activating the parasympathetic nervous system (PNS) (McCraty, 2015).

It is this angle of mind and body connection that this current study aims to understand further, with particular reference to recovery from anxiety. Those who suffer from anxiety are not in a state of coherence, and it is proposed that the use of mindful-based interventions and positive emotions will assist them in recovering the mind-body balance and alleviating moderate symptoms of their mental illness. Although the heart-brain phenomenon is still relatively new to science, it has been the subject of a cascade of qualitative and quantitative studies recently. These are hopefully paving the way for a stronger foundation of scientific credibility. Table 1 provides a breakdown of key vocabulary used within this research.

The topics researched in this study aim to inform the establishment of a Heart-led Counselling (HLC) Programme, by identifying focused practices to treat a person with anxiety at both a physiological and a psychological level. Such interventions encourage a broadly felt shift to coherence and support personal empowerment, growth and mental balance in many people's lives.

Table 1:

Definition of terms used within research

Term	Definition
Coherence	The term coherence refers to the physiological state between the heart and brain. Coherence is understood as the clear flow of information within and between the physiological systems and processes in the central nervous system (CNS), autonomic nervous system (ANS) and body. It is the increased order and harmony in both psychological (mental and emotional) and physiological (bodily) processes; this state of coherence allows for optimal functioning (McCraty, 2004). It is measured by heart rate variability (HRV) analysis of a person's heart rhythm pattern. A coherence state is when this becomes more ordered and sine wave-like, at a frequency of around 0.1 hertz (10 seconds) (McCraty et al., 2009).
Heart Rate Variability (HRV)	The term HRV refers to the “naturally occurring, beat-to-beat changes in heart rate, which are reflective of heart-brain interactions and autonomic nervous system variability” (McCraty, 2003, p. 2). HRV is a measure of the variance between the speed of heartbeats (Lehrer & Gevirtz, 2014). When one measures pulse and gets a total number of beats per minute, this masks the fact that, within that minute time period, the heart rate shows small increases and decreases. This is the heart rate variability (HRV). It gives a picture of the functioning of the ANS and it is "a physiological correlate of physical and psychological health" (Burg et al., 2012, p. 135). For example, when a person feels positive emotions the HRV is increased and is indicative of a healthy ANS that responds quickly and effectively to changing demands. By contrast, if a person experiences negative emotions, the HRV decreases and this is associated with poor health status and chronic arousal states of the ANS. This results in a predisposition to mental and physical illness, and poor self-regulation risk (Dekker et al., 1997).
Synchronisation	Synchronisation refers to a coherent state of balance between the heart and brain. This is one element associated with the effect of heart coherence (also referred to as cardiac coherence or resonance). It is the element of increased HRV within the heart, that is then associated with increased heart-brain synchronisation that occurs in a heart coherent mode. This synchronisation or coherence is associated with increased emotional stability and regulation, and adaptations from the ANS.

<p>Desynchronisation</p>	<p>Desynchronisation refers to the opposite of synchronisation, whereby the body is in a state of disorder (incoherence) and the heart and brain are not communicating effectively. This results in disorder of the nervous system and the brain (McCraty & Childre, 2010), which leads to imbalances in certain parts of the physiological body (Sapolsky, (2004) causing changes within the cardiovascular, hormonal, blood and bodily functions (Levenson, 1994).</p>
<p>Heart-focused Practices</p>	<p>Mindful-based techniques encourage patients to actively cultivate qualities of the heart, including appreciation, gratitude and care. A regular mindfulness practice includes heart focusing, breathing and the intent of feeling positive emotions within the heart. These practices are said to induce heart coherence which enhances physical, mental, emotional and overall well-being.</p>
<p>Mindfulness – based interventions</p>	<p>Mindfulness – based interventions are aimed at reducing stress and mental illness, along with physical pain. These interventions encourage patients to practice a holistic approach towards emotional regulation, by modifying thoughts and feelings that are associated with negative self-beliefs. Using strategies such as breathing, positive affirmations meditation and yoga practices.</p>

Chapter 1

The Power of Emotions and their Impact on Physiological and Psychological Coherence

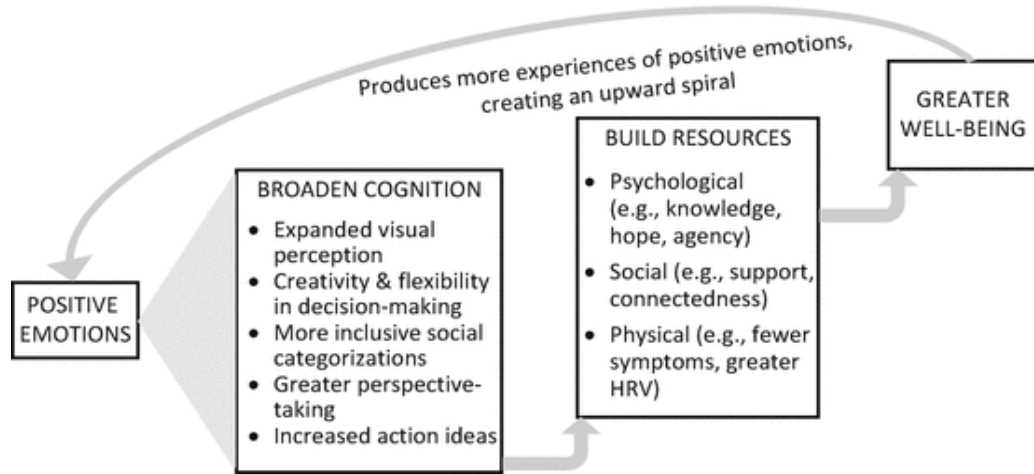
The vast majority of scientific evidence relating to psychological and physiological changes concerns the effects of **negative** emotions. To some extent this is a reflection of human nature; people register only one positive emotion for every three or four negative emotions (Ellsworth & Smith, 1988). This is probably because evolution has given us brains that are more responsive to negative experiences; these are the ones (such as fear) that our ancestors would have had to overcome in order to survive (Cacioppo et al., 2014). In addition, negative emotions hold more actionable behaviours than positive ones (Baumeister et al., 2001).

More recently, however, researchers have begun to investigate the psychological and physiological changes that are associated with positive emotions (Levenson, et al., 1990; McCraty et al., 2009). Positive psychology research indicates that positive emotions increase our resources, enhance faculties such as creativity (Isen, 1999: see Kashdan & Rottenberg, 2010, for review) and intuition (Bolte et al., 2003) and undo some of the impacts of negative emotions (Fredrickson, 1998; Fredrickson et al., 2000). Therefore, it is no surprise that mindfulness-based practices that evoke positive emotional states have become increasingly popular in today's contemporary psychology (Keng et al., 2011; Khoury et al., 2013).

Research studies have centred on how mindful-based interventions can help to build positive emotions and bring balance back into the mind and body (Childre et al., 2016; Fredrickson & Joiner, 2002). In particular, a study by Fredrickson et al. (2008) showed that positive emotions are induced in a person when he or she participates in intentional practices that evoke happiness, love and compassion. These positive emotions will broaden and build a person's emotional repertoire (Fredrickson, 1998, 2001) with the "broadening effect" building the person's "physical, intellectual, and social resources" (Fredrickson, 198, p. 300) in their repertoire and helping them to enter the broaden-and-build cycle (Fredrickson & Branigan, 2005). (See Figure 1.)

Figure 1:

The broaden-and-build cycle involving positive emotions (Kiken & Fredrickson, 2017).



Positive emotions that are felt continuously also alter attention and thinking patterns, enabling a person to access a range of perceptions and ideas (Fredrickson & Joiner, 2002). In summary, the frequent experience of positive emotional states has been shown to predict resilience and psychological growth (Fredrickson et al., 2003). In contrast, the innate survival impulses of the SNS that derive from negative emotions “narrow the repertoire” and block a person from seeking alternative behaviours (Fredrickson, 2004); this is associated with increased mental illness and emotional imbalance (Dana & Porges, 2018). The effects of positive and negative emotions are compared in Figure 2.

Figure 2:

The effects of positive and negative emotions (Fredrickson, 1998; Lyubomirsky, 2008; Rashid & Seligman, 2018).

Positive Emotions	Negative Emotions
<p>Adds adaptive value. Broadens <i>novel, creative and unscripted paths of thought</i> and action (equaling growth to thought-action repertoire). Builds internal personal resources from within i.e., physical, intellectual, social, psychological. Linked with higher rates of success, happiness, life satisfaction, and well-being. <i>Thought action tendencies that broaden the mind.</i></p>	<p>Narrows the thinking and repertoire. Automatic activation that ensures flight or fight behavioural responses. Adds some adaptive value to positive emotions. Linked with higher rates of depression, anxiety, mental health disorders. <i>Specific action tendencies and basic instincts of survival.</i></p>

1.1 Positive Emotions and Heart-brain Coherence

Extensive research into the field of psychophysiology has shown that generating sustained positive emotions facilitates a body-wide shift to a specific, scientifically measurable state termed “coherence” (McCraty & Tomasino, 2006a). Scientists measure changes in HRV, which indicates whether a person is in a state of coherence (see Chapter 3). Positive emotions that are felt consistently will equate with healthy relationships between organ systems and cognitive processes. Essentially, these functions work coherently together; this is what scientists within the field refer to as the “functioning state of heart-brain coherence” (Childre et al., 2016; McCraty, 2015; McCraty et al., 2009). More recently, psychophysiological research by Mostafazadeh et al. (2019) showed that the combination of intentional heart focus with sustained positive emotions increased the body's coherence function.

There is also provoking empirical research from Hofmann et al. (2010) into the topic of mindful well-being, that has provided evidence for the physiological and psychological changes a person will exhibit when feeling positive, mindful intentions. The study concluded that mindfulness-based therapy is a promising intervention for treating anxiety in clinical populations.

Research by Kabat-Zinn (2003) also concluded that mindful focusing and meditation help regulate a person's levels of stress and anxiety. Besides this, Ramel et al. (2004) measured the effects of mindfulness focusing and meditation on depressed patients and showed that, through heart-led meditation interventions, patients were able to decrease ruminative thinking and dysfunctional beliefs. In addition, they were able to access their reactions from a broader perspective, and this enabled them to be more resistant to relapse. This type of reconditioning is characteristic of Fredrickson's broaden-and-build theory where the participants build a newfound perspective in dealing with situations.

Fredrickson (1998) outlines a pathway to build and grow through the experience of positive emotions, generated using focused meditation and gratitude. Furthermore, heart focus is the centre of these pathways (Fredrickson, et al., 2008). Fredrickson and Losada (2005) state that, once a person tips the scales towards positive intent, he or she starts to move towards personal growth. Induced positive emotions broaden the way people pay attention, and expand their thought-action repertoires (Fredrickson & Branigan, 2005; Rowe et al., 2005), and have also been found to increase personal intuition (Bolte et al., 2003).

At a deeper level, studies have shown that heart-led practices that activate positive emotions offer physiological coherence within the body (Immordino-Yang & Damasio, 2007) and, more specifically, within the heart and brain communitive relationship (McCraty et al., 2009). Studies of MRI neuroimages by Immordino-Yang and Damasio (2007) suggest that the brain and heart are greatly affected by emotional processes. The coherence state that is achieved, when participating in focused interventions, is said to create balance and harmony within the mental and physical body.

It is clear from the literature reviewed that emotions have the power to influence both psychological and physiological processes in people and to affect their well-being and functioning.

Chapter 2

Methodological Approach

2.1 Integrative Literature Review

This study aimed to develop a credible treatment programme for those suffering from the symptoms of moderate anxiety. The Programme will focus on the use of certain, heart-led interventions. Such interventions make less use of logical, linear approaches, and more use of spiritual and emotional approaches. Heart-led practices are based on the premise that everyone is on a unique life journey, and needs to become an observer of his or her thoughts and experiences. The emphasis is on growing in ways that feel good, rather than on analysing or rationalising too much. Heart-led interventions can be used within an array of modalities, such as individual, group or family therapy. To ensure the validity of the proposed treatment Programme, each of these interventions had to be investigated, understood and evaluated. It was therefore decided that the most appropriate methodology was a comprehensive integrative literature review; this would provide both an overview and a logical way of collecting and integrating previous research (Webster & Watson, 2002).

Furthermore, the study required the collection of data from isolated topics, such as heart-brain science, Loving-Kindness Meditation, gratitude practices, and programme delivery context. An integrative literature review enabled the collection and evaluation of all research relevant to the study's aims (Torraco, 2005). To assist with the logical selection of relevant studies, a list of inclusion and exclusion criteria for publications was established (Table 2). These guidelines were important to ensure the validity and credibility of research findings that would inform the design of the Programme.

This was particularly important because much research in the field has been conducted by researchers under the umbrella of The HeartMath Institute. Since this Institute also seeks to sell to the public, it might be considered that some of their research is commercially motivated and potentially biased. Novella (2012) and Coyne (2015) have considered some of this research to be pseudoscience and of questionable value. The basis of their critique centres on the limited independent research and lack of experimental studies. Therefore, it was important that only findings published in reputable, peer-reviewed journals were considered.

Table 2:

Literature inclusion and exclusion criteria.

	Date	Sources	Database	Country	Demographics, age, mental health conditions	Key Words and isolated topics
Inclusion	1980 - 2021	Peer-reviewed journal articles, edited books.	Cambridge Journals Online, EBook Central, Emerald Journals, PsycArticles, Psychology & Behavioural Sciences, PsycTests, Sage Journals Online, Science Direct, Taylor & Francis, WILEY Online. The HeartMath Institute, NCIB Journals and articles. Frontiers in Psychology	UK & Ireland, Canada, USA, Australia	Studies on adults (18 – 65) with anxiety-based symptoms.	<p>Positive Psychology Interventions, Gratitude practices, Loving-Kindness Meditation (LKM).</p> <p>Heart Rate Variability (HRV)</p> <p>Psychophysiological coherence, neurocardiology, biofeedback interventions.</p> <p>HeartMath, The Quick Coherence[®], Stress Relief, The Freeze-frame technique, Inner-Ease[™] techniques, The science of the heart-brain coherence, heart-brain coherence and the reduction of anxiety, The autonomic nervous system and its effects on anxiety; humanistic counselling, therapeutic delivery in practice.</p>
Exclusion	Pre-1980	Popular magazine articles, articles that are not peer-reviewed, blog posts.			Studies that are not relevant to anxiety recovery, or the heart-brain science. Studies on children under 18 years, or adults over 65 years.	Anxiety disorders, substance abuse, Gestalt, cognitive behavioural therapy, the gut-brain axis, gut microbiota and anxiety, adrenalin, diet, exercise.

There was some adaptation as the project advanced, however, because research topics broadened to include some illnesses not related to anxiety. These topics still showed how heart-led practices, such as Loving-Kindness Meditation (LKM), gratitude and heart-brain coherence were used to alleviate symptoms associated with anxiety and stress. Therefore, these studies were included because they provided information relevant to the study's aim while, at the same time, covering a broader scope of mental illness recovery using heart-led practices.

2.2 Research Objectives and Questions

The integrative literature review focused on answering the following questions.

- 1) What are the psychological and physiological effects of a balanced heart-brain relationship (also known as coherence, or synchronisation) in an individual?
- 2) Does the literature indicate that using heart-led interventions can lead to a reduction in anxiety-related symptoms?
- 3) How do Positive Psychology Interventions (PPIs), such as gratitude practices and Loving-Kindness Meditation (LKM), contribute to generating quality positive emotions that can be used in heart-brain coherence and in reducing anxiety?
- 4) Does the literature show that the modality of delivery of heart-led interventions makes a difference and, if so, how will the counselling environment contribute?
- 5) Does the research literature show a justification for the proposed Programme and how can this be structured towards an effective and measurable scale?
- 6) How should the HLC Programme be structured, based on the findings of the literature review?

2.3 Formation and Justification of the Programme.

The research studies, identified using the criteria for inclusion in Table 2, informed the development of a treatment programme (HLC). The secondary research carried out in this project aimed to build and draw upon other therapeutic modalities in order to provide justification for further advancement and development of the suggested Programme. The formation and justification (Appendix 2) were developed from the results of the integrative literature review. Appendix 3 suggests a structure for the Programme. This Programme, if

successful, could potentially contribute to a new theoretical and practical approach to treating patients with anxiety.

2.4 Ethical Considerations

This study involved an integrative literature review, so no live participants were used. Therefore, it was unnecessary to seek ethical approval for the research.

Chapter 3

The Associated Psychological and Physiological Effects of a Balanced Heart-brain Relationship

3.1 What is the Heart-brain Phenomenon?

The heart-brain phenomenon is the connective relationship between the heart and the brain that offers a balance between the body's systems and regulates the function of the body on a psychological and physiological level (Childre et al., 2016). Essentially, the relationship is said to be characteristic of a state of coherence or incoherence, and functions through the biofeedback of HRV. For example, when a person is in survival mode and primed to fight or flee, the body is shut off from a flow of coherence between the heart and brain; this is when the SNS is activated and the body enters a protective state, unable to connect to the rest and response state of the PNS. The strengthening of coherence states is said to be most effective through participation in heart-led interventions that focus on creating positive emotions and mindfully connecting to the heart/chest area (McCraty, 2015). When a person achieves this, the PNS will be activated, thus correcting the balance on a cognitive and physiological level.

3.2 The HeartMath Institute's Contributions to Heart-brain Coherence Research

Early studies by Lacey and Lacey (1974, 1978) concluded that the heart communicates with the brain in ways that significantly affect how we perceive and react to the world. Research over the past 25 years has strengthened their conclusions and delved more deeply into the science behind heart-brain coherence. In particular, scientists at the HeartMath Institute have pursued heart-focused research in neuroscience, cardiology, physiology, biochemistry, bioelectricity, physics and psychology (Childre et al., 2016). This Institute was founded in 1991 to develop heart-focused knowledge and, today, The HeartMath system is applied globally.

Over the past decade, the researchers have pioneered crucial understandings of the electromagnetic, neurochemical, biophysical and hormonal information passed between the brain and the heart (Childre et al., 2016; McCraty, 2001; McCraty et al., 2003, 2009). The findings have demonstrated strong links between emotional states and how the heart responds. The studies have also supported the notion that the heart and brain need to communicate

together to achieve a “fully functioning state of coherence” (McCraty et al., 2003.) (See Table 1 for definition of coherence.)

Scientists at the HeartMath Institute (Childre et al., 2016; McCraty, 2001; McCraty et al., 2003, 2009) now understand that the heart not only responds to emotion via ANS activity but also generates signals, through rhythmic activity, that play a significant part in determining the quality of an individual's emotional experience. The heart not only receives input from ANS activity, but it also feeds back to the brain, creating two-way communication. This leads to the harmony of psychological and physiological processes, which allows for optimal functioning (McCraty, 2004). Interestingly, Armour (1991) classified the heart as an endocrine gland, and coined the term ‘heart-brain’, illustrating the extent to which the heart is involved in communication within the body. The heart is said to play a vital role in moderating stress, anxiety and depression; studies even suggest that the heart sends messages to the brain about how to react, based on emotional experience (Childre et al., 1999; McCraty, 2001, 2015).

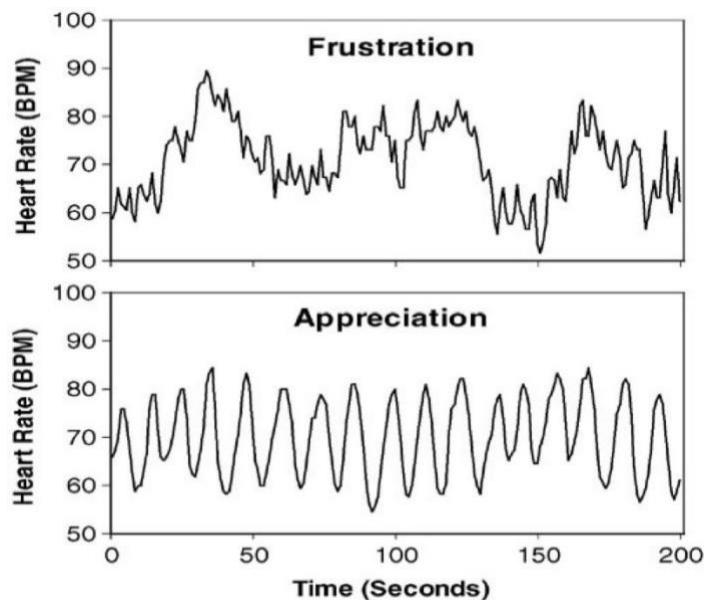
3.3 Optimal Heart-brain Coherence as a Marker for the Reduction in Anxiety

It is well known that emotional stress adversely impacts an individual’s learning and performance (McCraty, 2004). However, continuous stress and negative emotions also result in profound desynchronisation of the nervous system process (McCraty, 2004). In the cardiac coherence study by McCraty and Zayas (2014a), different heart rate variability (HRV) waveforms were identified and associated with anxiety, frustration or anger (Figure 3). The change associated with negative emotions was reflected as a reduction in variation. Reduced HRV is associated with a decrease in an individual’s psychological resiliency, behavioural flexibility and ability to adapt to changes in social demands (An et al., 2019). In addition, it is associated with illnesses such as depression and anxiety (Chalmers et al., 2016). (See Table 1 for explanation of HRV).

Figure 3:

Variation in heart rate pattern (determined by measuring biofeedback of HRV) depending on which emotions are felt.

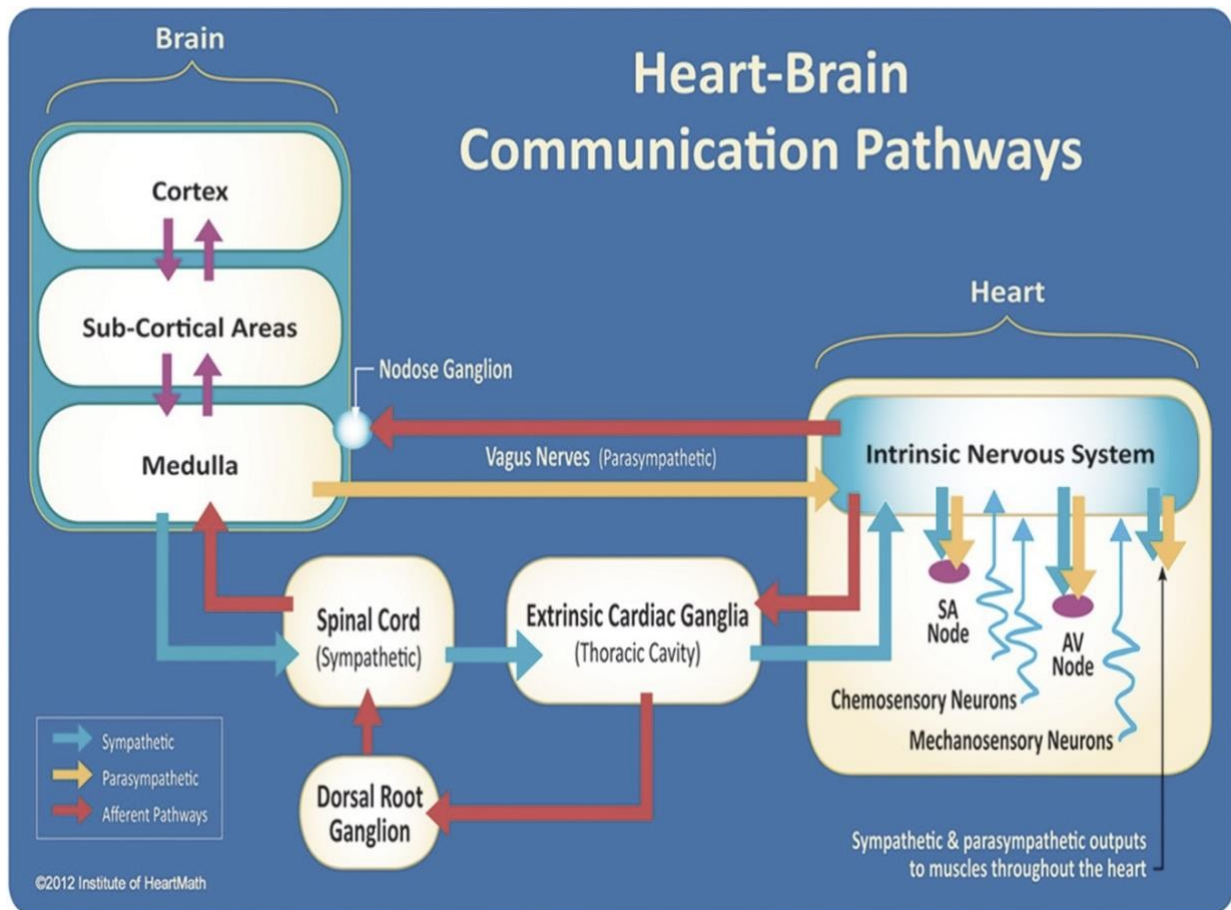
The heart rate graphs show patterns of the HRV waveforms when different psychological states are observed (McCraty & Zayas, 2014b). For example, the bottom graph shows an individual who is experiencing sustained, modulated positive emotions, in this case, appreciation. “A coherent rhythm can be defined as a relatively harmonic (sine wave-like) signal with a very narrow, high-amplitude peak” (McCraty & Childre, 2010; p. 14). This results in PNS dominance and a smooth sine wave reading, which indicates coherence. In contrast, the top graph shows the HRV when negative emotions, such as frustration, shift the balance towards a SNS pre-eminence; the pattern shows a jagged waveform in the HRV reading.



Since HRV differs for people in different emotional states (McCraty et al., 1995; McCraty & Zayas, 2014b, Figure 3), the emotional state must be communicated between the heart and brain, through neural signals (McCraty et al., 1995). These signals flow through the afferent and efferent neural pathways of the sympathetic and parasympathetic branches of the ANS (Malik & Camm, 1995; Kamath et al., 2013). Figure 4 illustrates the neural communication pathways between the heart and brain; it is these that are responsible for the generation of HRV and coherence.

Figure 4:

The neural communication pathways between heart and brain.



These pathways direct the HRV signals so that the heart and brain can act according to the emotional state felt by a person. This means the heart-brain communication is a physiological response to the nature of emotional experience. McCraty et al. (1995, 2009) state that emotional experience is directly related to the level of coherence of the heart rhythm pattern. McCraty and Zayas (2014b) showed the relationship between cardiac coherence and emotional experiences and illustrated HRV wavefront patterns for incoherent and coherent states. They

also explored the hypothesis that self-induced positive emotions increase the coherence in bodily processes.

McCraty and Zayas (2014b) indicate that positive emotions produce a reconditioning physiological effect. Conversely, negative emotions give rise to depleting physiological effects (desynchronisation). The quality of emotional experience therefore dictates how the body will respond. Thus, it can be stated that the higher the HRV, the more psychological adaptability is present, and therefore there is less chance of anxiety or mental illness. Conversely, the lower the HRV, the less adaptability is present and therefore the greater the chance of anxiety or mental illness (McCraty & Zayas, 2014b).

When a person feels negative emotions, the SNS is activated (McCarty, 2016) which prepares the body for survival (Lacey & Lacey, 1978). However, during states of prolonged stress and anxiety, the SNS becomes the baseline for how the heart, brain, and body respond to external stress in general (Cannon, 1929). In a mentally healthy person, there is a balance between the sympathetic and parasympathetic branches (McCraty & Shaffer, 2015), with PNS activity predominating during rest periods. However, during prolonged periods of stress, the SNS replaces the PNS. Arousal of the SNS leads to increased heart rate, increased cardiac output, and increased secretion of hormones such as epinephrine, corticotropin and cortisol. It is understood that the heart responds to this state by sending the change in HRV as distress signals to the brain, which places the body in an unbalanced state and gives rise to incoherence between heart and brain (McCarty, 2016).

To reverse the dysfunction within the body, an individual needs to create balance between the SNS and the PNS (McCraty, 2001), and thereby the heart and the brain (Isen, 1999). To do this, a person may use the experience of positive emotions and heart-led interventions, which aim to bring the body back into coherence (Fredrickson, 1998; Lacey & Lacey, 1978; McCraty, 2015). Studies by McCraty et al. (1995, 1998) have shown that the use of heart-coherence practices in daily life produces improvements to overall well-being because they adjust the ANS balance. These practices involve the synchronisation of the breathing rhythm with the heart's rhythm (McCraty 2001). This balanced state then affects the condition of all other systems under ANS control, such as the respiratory, cardiac, digestive and immune systems (Barrios-Choplin et al., 1997; Luskin et al., 2002). Using biofeedback (measuring HRV), activity of the ANS can be electronically monitored and presented as waveforms in real-time.

This can help people to exercise voluntary control over their HRV patterns, particularly when suffering from anxiety and stress (McCraty et al., 2009).

However, it has been shown that a coherent heart is not a metronome (Shaffer et al., 2014); its rhythms are characterised by both complexity and stability over longer scales (Hirsch & Bishop, 1981, 1996). This means that a coherent heart rhythm is a snapshot of an in-sync state which may vary over the short-term while being measured. Nevertheless, these understandings have prompted new approaches to psychophysiological self-regulation, using techniques to rebalance the ANS in order to treat anxiety disorders (Childre et al., 2016). This will be expanded upon in Chapter 4.

3.4 Positive Emotions and Synchronisation

When a person enters into the coherence state, perhaps through accessing positive affect, the HRV develops a smooth, sine wave-like pattern (Figure 3) that indicates **synchronisation** between the activities in the two branches of the ANS (Kamath et al., 2013). Synchronisation also involves a range of changes in physiological entrainment where several different bodily systems synchronise to the rhythm generated by the heart, depending on emotional state (Bradley et al., 2010). Such changes occur in various physiological oscillatory systems as well as in vascular resonance (McCraty, 2004; Vaschillo, et al., 2011). It is suggested that mindful, heart-led practices that promote relaxation and positive emotional states will promote activation of the PNS and lead to synchronisation between the heart and brain (Lacey & Lacey, 1978; McCraty, 2015).

Several studies (McCraty et al., 1995; Tiller et al., 1996) have shown that, during the experience of positive emotions, the sine wave-like pattern naturally emerges in the HRV data, without any attempt to change breathing patterns or to focus specifically on positive emotions. McCraty (2002) found a connection between positive emotional states in participants, and changing heart-brain dynamics; this indicated a potential physiological link between positive emotions and improvements in faculties such as motor skills and focused attention. This was supported by Fredrickson et al. (2008) who found links between positive emotional states and increased HRV when using LKM. These studies indicate a fundamental relationship between positive emotions, the heart's activity, and optimal functioning.

In conclusion, research has shown that, if an individual is guided to connect with positive emotions, this will produce a state of coherence. Coherence will help create long-term optimal functioning, reduce anxiety and mental illness and broaden an individual's resilience (Childre et al., 1999; Fredrickson, 1998). It is clear that, for now, the starting point for the treatment of someone with symptoms of anxiety is to develop the ability to access positive emotions.

Chapter 4

Heart-led Interventions and their Effectiveness in Reducing Anxiety

The research described in the previous chapters has led to an intentional focus on heart-brain coherence when making therapeutic interventions. In particular, the HeartMath Institute employs a system that centres on heart-based emotion refocusing techniques, and heart rhythm feedback technology (measuring HRV) that enables people to generate and sustain psychophysiological coherence independently (McCraty & Tomasino, 2006b). These techniques have been effective in significantly reducing emotional stress and improving mental well-being (McCraty, 2015).

This effectiveness has been evidenced in several studies. Table 3 summarises the focus, methodology and findings of five such studies. In addition, a study by Moussavi and Birjandi (2019) concluded that a combination of intentional heart-focused interventions, along with sustained positive feelings, increased heart-brain coherence and reduced anxiety among Iranian learners. This study offers hopeful findings for the HLC Programme, as it indicates that a combination of heart-focused mindfulness and positive emotions produce decreased levels of anxiety, evidencing a causal relationship.

Also, an empirical study by Immordino-Yang and Damasio (2007) supported the relationship between heart-led interventions and heart-brain coherence; they evidenced how focused mindfulness led to physiological coherence within the body and, more specifically, within the heart and brain communicative relationship. A more recent study from Lehrer et al. (2020) showed that mindful-based intervention affects HRV and coherence within the body. The systematic and meta-analytic review studied HRV biofeedback (HRVB) and the impact on symptoms of mental health; they concluded that HRVB has a significant effect on anxiety, depression and anger.

McCraty et al. (2009) suggested that individuals can learn to enter a state of psychophysiological coherence using techniques to achieve heart-brain coherence created by The HeartMath Institute. In a study involving classroom-based programmes, McCraty (2004) found that, by using the heart-brain coherence interventions, the physiological activity associated with positive emotions led to a *reversal* of desynchronisation in nervous system

activity; these systems tended, instead, towards synchronisation. This resulted in improvements in the students’ emotional health, social behaviour, and overall academic performance.

4.1 Summary of Selected Empirical Research into Heart-brain Coherence in Relation to Anxiety recovery.

Table 3 below outlines five recent empirical studies, published in peer-reviewed scientific journals, that investigate the relationship between heart-brain coherence and its effect on anxiety.

Table 3:

Summary of recent heart-brain coherence studies in relation to symptoms of anxiety.

Source/Study	Clinical Focus Description (sample, methodology)	Relevant Findings
<p>Bradley et al., 2010</p> <p><i>Emotion Self-Regulation, Psychophysiological Coherence, and Test Anxiety: Results from an Experiment Using Electrophysiological Measures</i></p>	<p>Focus: The effects of a novel, classroom-based emotion self-regulation programme (TestEdge) on test anxiety, socio-emotional function, test performance, and heart rate variability (HRV) in high school students. It was implemented as part of a more extensive study.</p> <p>Methodology Approach: It was an empirical study, with matched-pairs analysis. Conducted as a controlled pre-and post-intervention laboratory experiment, using electrophysiological measures, on a random stratified sample of students from intervention and control schools (N = 136).</p> <p>Participants: The population of tenth-grade students in two California high schools (N = 980).</p>	<p>The post-intervention electrophysiological results showed a pattern of improvement across all HRV measures.</p> <p>Therefore, students with high test anxiety at the start of the intervention exhibited increased HRV and heart rhythm coherence, even during a resting baseline condition. Consistent with these results, students exhibited reduced test anxiety and reduced negative affect after the intervention.</p> <p>There was suggestive evidence from a matched-pairs analysis that reduced test anxiety was associated with increased psychophysiological coherence, and this appeared to be directly associated with improved test performance – a finding consistent with evidence from the more extensive study.</p> <p>In conclusion, the study indicated that the students who received the intervention programme, learned the skill to manage their emotions better, and also learned how to self-activate the psychophysiological coherence state under stressful conditions.</p>
<p>Trousselard et al., 2016</p>	<p>Focus: The study explored the benefits of CCT for clinically stable patients with schizophrenia. The CCT</p>	<p>Results showed that these interventions improved (or tended to improve) well-being outcomes and</p>

<p><i>Cardiac Coherence Training to Reduce Anxiety in Remitted Schizophrenia, a Pilot Study</i></p>	<p>incorporated a series of emotion-refocusing and restructuring techniques developed by the Institute of HeartMath.</p> <p>Methodology Approach: The study performed a pilot cross-sectional survey.</p> <p>Interventions Used: Patients received exercises to make heart rate fluctuation more rhythmic or coherent; they used Heart Focused Breathing® and Neutral Quick Coherence® exercises from the HeartMath programme. Secondly, the patients learned steps to appreciate themselves, to replace stressful responses with more positive emotions, and to engage more freely with the caring side of others using Freeze-Frame® and Heart Locking® training.</p> <p>Participants: (n=10) patients were enrolled in the programme, which consisted of twelve, weekly, 1-hour sessions. Standardised questionnaires were used before and after the intervention, to assess anxiety, well-being outcomes, and how patients dealt with stress and stressors.</p>	<p>anxiety. In addition, the study concluded that the HeartMath interventions helped participants to evaluate emotional stressors with more objectivity.</p> <p>Results showed the most significant transformations with patients that had the highest clinical and emotional suffering. Thus, this pilot study revealed that Cardiac Coherence Training might help patients with schizophrenia deal with anxiety in daily life.</p>
<p>Ginsberg et al., 2010 <i>Cardiac Coherence and Post-traumatic Stress Disorder in Combat Veterans</i></p>	<p>Focus: A pilot study was undertaken to assess the covariance of coherence and information processing in combat veterans. An additional study goal was assessing HRV biofeedback effects on these veterans' coherence and information processing.</p> <p>Methodology Approach: A two-group study (combat veterans with and without PTSD), with pre-post study of coherence and information processing was employed, with baseline psychometric covariates.</p> <p>The study was conducted at an outpatient mental health clinic. Five combat veterans from Iraq or Afghanistan with PTSD were compared with five active-duty soldiers, with comparable combat exposure but without PTSD.</p> <p>Participants: Participants met with an HRVB professional weekly, for four weeks, and received visual feedback</p>	<p>The study concluded that each participant achieved cardiac coherence and the increase in coherence ratio was significant post-HRVB training. In addition, significant improvements in the information processing indicators were achieved.</p> <p>The study further suggested that the significant increase of coherence was the likely mediator of cognitive improvement seen.</p> <p>The study further expanded that cardiac coherence can be classified as an index of the strength of control of parasympathetic cardiac deceleration in an individual, making it of cardinal importance for the individual's regulation of attention and affect.</p>

	<p>in HRV patterns while receiving resonance frequency, breathing and positive emotion induction training.</p>	
<p>Bradley et al., 2007</p> <p><i>Reducing Test Anxiety and Improving Test Performance in America's Schools: Summary of Results from the TestEdge® National Demonstration Study</i></p>	<p>Focus: This study investigated the correlates and consequences of stress and test anxiety in a large sample of students (980) and investigated the effects of HeartMath tools.</p> <p>Methodology Approach: Experimental group of n =636 compared to n =344 in a control group.</p> <p>Participants: A large sample of students (980) students participated in the TestEdge® program, which features tools for reducing stress and test anxiety, improving academic performance and enhancing emotional and relational competence.</p> <p>The delivery was performed by teachers who had received instruction in the Resilient Educator® programme (designed to boost teacher performance, strengthen resiliency and improve school relationships).</p>	<p>The study revealed consistent evidence of positive effects found from the intervention on the students when their stress levels, emotional stability and the results of other measures were compared with those of students in the control group. Of those students at the intervention school who reported test anxiety at the beginning of the study, 75% showed reduced levels of test anxiety by the end of it. This reduction in mean test anxiety was also evident for more than three-quarters of all classrooms.</p> <p>It was found that students in the experimental group had harnessed the ability to self-activate the coherent state before taking a stress-provoking test. By the students learning to activate coherence, it resulted in significant reductions in test anxiety and corresponding improvements in measures of emotional disposition.</p> <p>Additionally, there was a significant increase in test performance in the experimental group over the control group.</p>
<p>Ratanasiripong, et al., 2012</p> <p><i>Biofeedback Intervention for Stress and Anxiety among Nursing Students: A Randomized Controlled Trial</i></p>	<p>Focus: The study aimed to investigate the impact of a biofeedback intervention program on nursing students' levels of stress and anxiety during their first clinical training.</p> <p>Methodology Approach: A randomised controlled study, with a two-group experiment.</p> <p>Participants: consisted of n= 60 second-year baccalaureate nursing students. The n=30 participants in the biofeedback group received training on how to use the biofeedback device to assist in stress and anxiety management for 5 weeks. The n=30 in the control group did not receive any training.</p>	<p>Results indicated that the biofeedback group was able to maintain the stress level, while the control group had a significant increase in the stress level over the 5 weeks of clinical training. Additionally, they concluded that the biofeedback group had a significant anxiety reduction, while the control group had a moderate increase in anxiety.</p> <p>Overly, the study reported that the better the nursing students managed their stress and anxiety, the more successful they were in their clinical training.</p>

4.2 Overview of Relevant Findings

Research suggests that heart-led interventions are being used successfully in several different settings, including the workplace and the classroom, and in the fields of various mental health issues. The majority of these studies have taken place in experimental settings; it would be interesting to see if these interventions are also being used in counselling or psychotherapist practices. Practitioners are using heart-brain techniques in combination with other modalities, such as Eye Movement Desensitisation and Reprocessing (EMDR), counselling, and mindfulness-based psychotherapy (Childre & Martin, 2011). These techniques, in combination, have proved to be successful in the treatment of mood issues, chronic and mild anxiety, sleep disturbances, stress, pain syndromes, attention deficits and addictions, along with many other conditions (McCraty & Zayas, 2014a).

For example, a small-scale study by Jasubhali (2020) investigated the effect of the HeartMath Institute's "Quick Coherence Technique" on psychophysiological coherence, stress, anxiety, depression and emotional state in young adults in India, in light of the recent global pandemic. The study was built on earlier research by Edwards (2016) that concluded that HeartMath interventions, particularly ones that are focused on breathing and positive emotions, are clinically effective at producing psychophysiological coherence. Jasubhali's (2020) study supported these conclusions and evidenced significant changes from negative to positive states after only five sessions of focused HeartMath interventions.

Taken together, the studies outlined above provide support for the effectiveness of heart-led interventions in reaching coherence, and make a convincing case for their use as a means of reducing the symptoms of anxiety. However, the following limitations to the use of these interventions may be anticipated.

4.3 Limitations of HeartMath Interventions

The HeartMath Institute uses two types of interventions to help patients reach optimal functioning; HeartMath technologies and heart-brain interventions. The HeartMath technologies can be used by professionals in the mainstream therapeutic context. For example, the EmWave® is a sophisticated heart-rate monitor that measures and displays the HRV of a patient. In combination with desktop or mobile phone software, a practitioner can map a patient's emotional state and guide the patient towards coherence (Childre et al., 1999). Anxiety disorders, such as Music Performance Anxiety, can now be addressed with these new

psychophysiological applications (Armour, 2007), by using HRV biofeedback (Childre et al., 1999; McCraty, 2003; McCraty, 2006b). HRV biofeedback essentially is used to measure the change of coherence. This, therefore, makes HRV analysis an important tool that provides a window into the activity occurring between the heart and brain.

However, should HRV biofeedback be used by a person who is inexperienced in measuring and interpreting the changes? Furthermore, should participants be allowed to determine their own heart-brain coherence state? This raises concerns about the accuracy, reliability and validity of the results. The HRV readings are deemed only to **suggest** changes in HRV but, nonetheless, it is important to consider that this may have ethical repercussions when patients are allowed to see how they respond to negative emotions, while experiencing them in real-time. Although, this may offer a new dimension to therapy, it is clear that there still needs to be discussion on the correct use of the techniques in live sessions.

There is also a gap in the HeartMath heart-brain interventions as these mindful practices only offer an activity-based intervention. The interventions suggest a focused attempt to **produce** a rebalancing by breathing and focusing on positive emotions. The ability to **connect** with felt positive emotions isn't part of the intervention. It is important to acknowledge this, as heart-led interventions rely upon a person's ability to **connect** with a positive emotional state (McCraty, 2015) in order to activate the process of coherence. For example, a person can be guided to feel appreciation, or hold compassion, but this may prove difficult to anxiety sufferers or depressive patients, who lack the positive emotional repertoire from which to draw (Fredrickson, 1998; Fredrickson & Joiner, 2002). Therefore, more attention needs to be focused on how an individual may **build** the repertoire of positive emotions in the primary instance. Despite this, these interventions have shown to be effective in treating PTSD sufferers (Bradley et al., 2010), anxiety sufferers (Trousselard et al., 2016) and patients with depression (Economides et al., 2020). It is felt that positive psychology interventions (PPI) will contribute to bridging this gap, and could potentially make the use of heart-led interventions more effective, especially for people with certain mental illnesses.

4.4 What is the Difference between PPI and Heart-led Interventions?

As PPIs are a focus for the proposed HLC Programme and offer a companion to the heart-led interventions, it is important to identify the differences between the two. Heart-led interventions used by HeartMath have a focused intent – to **produce a coherent state** between

the heart and brain. There is a clear cause-and-effect relationship. They aim to activate a cascade of events within the body, psychologically and physiologically, as the patient becomes more mindful of the heart/chest area, while breathing and focusing.

This approach is similar to that of PPIs and, in this researcher's opinion, there is little distinction between the two types of intervention. There is no stated aim to achieve coherence when using the mindful-based PPI practices, even though by achieving focused intent and relaxation these practices must surely be contributing towards a coherent state. However, heart-brain coherence has not been associated with these types of interventions in research findings. This association may simply not have been investigated because of the division of topics; the scientific approach to heart-brain coherence phenomena is one thing, and the associated effects of mindfulness studies is another.

Nevertheless, the combination of heart-brain coherence practices and PPI are felt to offer a new dimension to counselling and psychotherapy practitioners and the need to acknowledge the similarities is obvious to this researcher. This provides justification for bringing both types of intervention together into a programme and using the combination to treat anxiety. Recently, an independent South African study by Edwards (2016) attempted to introduce HeartMath interventions as a "positive psychology paradigm" for promoting psychophysiological and global coherence. The study concluded, from independent and collaborate literature research evidence, that HeartMath interventions hold substantial value within positive psychology.

4.5 The Chosen HeartMath Interventions for the HLC Programme

The focus of this study centred on the effectiveness of heart-brain interventions, and not on the use of HeartMath technologies. Three specific heart-brain interventions were chosen for use in the Programme, and all of them focus on rebalancing the mind and body. These three interventions offered support with building coherence, activating the PNS and creating a balance between physiological and psychological processes. They were selected based on scientific research into heart-brain coherence from the HeartMath Institute, and matched with the overall therapeutic nature of the HLC Programme; they aim to balance, increase HRV and give rise to positive emotional states. They do not require the physiological biofeedback element (recording HRV). These are as follows:

- Inner-Ease™ Technique

- The Quick Coherence®
- Stress Relief: The Freeze-frame Technique

The three chosen HeartMath interventions aim to ease negative emotions and manage stress and anxiety (Childre & Martin, 2011). Table 4 gives details of each intervention and its effects, as suggested by The HeartMath Institute.

Table 4:

Details of selected HeartMath Institute interventions. Sourced from Childre, 2010.

<p>Inner-EaseTM Technique</p> <p>A quick and easy-to-learn method to add ease in the moment, in and out of sessions. By practising Inner- Ease, a patient will acknowledge the feelings as soon as they arise, or feel out of sync; once feelings such as stress, anxiety, impatience, and mental gridlock have been identified, then the patient can focus on heart- centred breathing, into the heart, which aids focused attention back into sync.</p>	<p>Research suggests this can be used to help create coherent wave patterns in the heart rhythm, and help establish balance and calm in a patient’s mental and emotional nature while activating the coherence process.</p>
<p>The Quick Coherence®</p> <p>This mindfulness technique, used in combination with heart focusing, and monitoring of breathing, aims to bring greater awareness of the heart and its presence. These exercises have similar effects to those found during meditation.</p>	<p>Mindfulness, heart-focused and heart breathing- focused exercises have been shown to create a state of coherence in about 60 seconds, by releasing stress and stopping draining emotions such as frustration, irritation, anxiety and anger.</p>
<p>The Freeze-Frame Technique</p> <p>This is classed as very connective practice, and it aims to create heart and brain communication. It involves a shift from frictional consciousness to harmony consciousness. It aims to move a person away from the state of irrational thinking. It is a one-minute technique that allows a major shift in perception and is considered more effective than positive thinking; it creates a definitive, heartfelt shift in how a situation is viewed by an individual. The exercise should be tried when a person</p>	<p>This is a focused and mindful technique to strengthen and activate the parasympathetic nervous system, by activating neurones in the heart. This creates a heart-brain coherence that gives rise to a positive emotional state and helps in situations provoked by anxiety.</p>

has sufficient time; it is not so much momentary, but rather a cold reflection, after the fact.	
---	--

(HeartMath Institute website, 2021: <https://www.heartmath.com/blog/performance/>)

Chapter 5

The Effective Use of Positive Psychology Interventions to Evoke Sustained Positive Emotional States and Aid Anxiety Reduction

PPIs are considered an umbrella paradigm (Csikszentmihalyi, 2006) where many other well-being theories are connected (Peterson, 2006); their aim is to help generate healthy positive emotions so that patients can attain greater levels of well-being (Fredrickson, 1998; Lalande, 2004; Wood & Tarrrier, 2010). PPIs have been broadly supported in several critical studies to generate positive emotional states (Bolier et al., 2013; Cohn & Fredrickson, 2010; Seligman, et al., 2005; Sin & Lyubomirsky, 2009). These studies offer a new understanding of positive emotions and the impact they have on the mind and body, and are successfully supporting modern therapy in stress induced issues. Parks and Biswas-Diener (2013) defined a PPI as an activity that addresses a “positive psychology construct” and has a body of research evidence supporting its effectiveness. This means that many focused mindful activities could potentially qualify as PPIs, but they have not yet obtained enough scientific evidence to support their effectiveness. This supports the current researcher’s earlier identification of the similarities between heart-led interventions and PPIs and strengthens their combined use in the HLC Programme.

Rashid and Seligman (2018) present a collection of research studies that demonstrate how utilising PPIs in therapeutic contexts produces emotions of hope and positivity which, in turn, decreases anxiety, depression and mental illness (Appendix 1). Also, Immordino-Yang and Damasio (2007) state that PPIs focused on mindfulness will evoke stronger positive emotional states. Positive emotional states are correlated with the activation of coherence within the body, supporting the connective nature between the heart and the brain, and bodily functions.

The HLC Programme relies on good quality positive emotions that the patient can utilise (Fredrickson, 1998) while interacting with the heart-led interventions. It was vital, therefore, to choose appropriate Positive Psychology strategies that would fit well with the overall mindfulness nature of the Programme. As the study’s methodology is selective in character, the researcher identified literature from LKM and gratitude practices for review. Table 5 outlines recent, relevant studies, published in peer-reviewed scientific journals, that investigate the relationship between the chosen PPIs and their effects on anxiety and positive emotional states.

Table 5:

Summary of selected research into LKM and gratitude interventions in relation to anxiety recovery.

Source/Study	Clinical Focus Description (sample, methodology)	Outcome/Findings
<p>Hofmann et al., 2011.</p> <p><i>Loving-Kindness Meditation and compassion meditation: Potential for psychological interventions</i></p>	<p>Focus: Exploring literature relating to mindfulness-based meditation interventions in contemporary psychology.</p> <p>Methodology Approach:</p> <p>A comprehensive literature review of the background, the techniques, and the contemporary empirical literature on LKM and compassion meditation.</p>	<p>The literature suggests that LKM is associated with an increase in positive affect and a decrease in negative affect.</p> <p>Neuroimaging studies researched suggest that LKM may enhance activation of brain areas that are involved in emotional processing and empathy.</p> <p>Overall, it concluded that when LKM is combined with empirically supported treatments, such as cognitive-behavioural therapy, then LKM may be a useful strategy for treating a variety of different psychological problems, such as depression, social anxiety, marital conflict, anger, and coping with the stress of long-term caregiving.</p>
<p>Weibel et al., 2017.</p> <p><i>Does Loving-Kindness Meditation Reduce Anxiety? Results from a Randomized Controlled Trial</i></p>	<p>Focus: To collect knowledge about the effectiveness of LKM in reducing prevalent mental health problems: anxiety.</p> <p>Methodology Approach: A randomised controlled trial, assigning non-clinical undergraduates to either a 4-session, group-based LKM intervention (n = 38) or waitlist control (n = 33).</p> <p>Self-reported anxiety, compassionate love, and self-compassion were assessed at pre-treatment, post-treatment, and at an 8-week follow-up.</p> <p>Participants: Non-clinical undergraduates in two groups. One group-based LKM intervention (n = 38) and one waitlist control (n = 33).</p>	<p>Relative to control participants, participants in the LKM intervention reported higher compassionate love and self-compassion at the post-treatment assessment and higher self-kindness (a component of self-compassion) at the follow-up.</p> <p>However, anxiety ratings did not significantly differ between conditions at post-treatment or follow-up.</p> <p>Overall, this study provides evidence that a short course of LKM, as an intervention, can help enhance self-compassion and compassion for others in non-clinical undergraduates. However, LKM intervention was not significantly more effective than waitlist in reducing anxiety – this showed low correlation.</p>
<p>Hutcherson et al., 2008.</p> <p><i>Loving-Kindness Meditation Increases Social Connectedness</i></p>	<p>Focus: To examine whether social connection and positive emotions could be created toward strangers in a controlled laboratory context, using LKM as an intervention.</p> <p>Methodology Approach: The study examined LKM effects on positive and</p>	<p>The results showed that, even a few minutes of Loving-Kindness meditation increased feelings of social connection and positivity towards unknown individuals on both explicit and implicit levels.</p>

	<p>negative mood. The study assessed the impact of LKM on affective responses to the self and others; they measured the participants' explicit and implicit evaluative responses to photographs of either themselves, a known person, or three neutral strangers. This was done before and after a guided visualisation LKM directed toward a photograph of one of the neutral strangers.</p> <p>To test whether LKM had mood effects compared to IMAGERY, the study conducted separate 2-group, 2-time analyses of variance (ANOVAs) on positive and negative mood. Average LKM practice of participants included in the study was less than 1.7 hours per month</p> <p>Participants: A total of 93 participants (57% female), with mean age 23.6 years, volunteered for this study.</p>	<p>These results further suggested that LKM is an easily implemented technique that may help to increase positive social emotions and decrease social isolation.</p>
<p>Totzeck et al., 2020.</p> <p><i>Loving-Kindness Meditation Promotes Mental Health in University Students.</i></p>	<p>Focus: The main goal of this present study was to examine whether LKM might be an effective intervention to promote positive mental health using the Positive Mental Health Scale (PMH) and thereby decrease depression, anxiety and stress in university students.</p> <p>Methodology Approach: Multiple analyses of variance were conducted to test for short- and long-term effects of LKM on positive and negative mental health measures. Compared matched groups. One group of university students received LKM and one group did not receive LKM treatment. All participants in both groups completed positive and negative mental health measures at baseline and 1-year follow-up assessments.</p> <p>Participants: The sample (n = 110) consisted of university students in Germany. One half of them (n=55) underwent LKM intervention.</p>	<p>The study found a significant short-term effect of LKM on anxiety and Positive Mental Health Scale marker. The long-term analyses of this study revealed a significant decrease in depression, anxiety, and stress for LKM completers, and a significant increase in depression, anxiety, and stress for the control group.</p> <p>In conclusion, the results suggest that LKM enhances mental health in university students who are partaking in meditative practices.</p>
<p>Fredrickson et al., 2008.</p>	<p>Focus: To test Fredrickson's (1998, 2001) broaden-and-build theory of positive emotions in a field experiment with working adults.</p>	<p>The results showed that LKM led to significant shifts in the participants' daily experiences of positive emotions, including love, joy, gratitude, contentment, hope, interest, pride, awe, and amusement.</p>

<p><i>Open Hearts Build Lives: Positive Emotions, Induced Through Loving-Kindness Meditation, Build Consequential Personal Resources</i></p>	<p>Methodology Approach: Participants either received LKM or were assigned to a waitlist control group. LKM was taught during six 60-minute group sessions conducted over seven weeks, with 20–30 participants and one instructor per group.</p> <p>Participants: They examined employees (n= 20-30) of a large business software and information technology services company.</p>	<p>These increases were observed both within the paths of change in daily emotions over nine weeks, as well as two weeks after the formal training had ended.</p> <p>Although the study highlights that these shifts in positive emotions were relatively small, they were associated with increases in various personal resources, including mindful attention, self-acceptance, positive relations with others, and good physical health. In addition, the study suggested that these gains led participants to become more satisfied with their lives and experience fewer depressed moods.</p>
<p>Hofmann et al., 2015.</p> <p><i>Loving-Kindness Meditation to Target Affect in Mood Disorders: A Proof-of-Concept Study.</i></p>	<p>Focus: To examine the potential therapeutic utility of a brief LKM group intervention for symptoms of dysthymia and depression.</p> <p>Methodology Approach: Qualitative analysis, using two independent and uncontrolled studies carried out at different centres, one in USA (n = 10), and one in Germany (n = 8).</p> <p>Participants: Data were gathered from eight random participants, four from Study 1 at USA and four from Study 2 at Germany. The participants were interviewed after completing the intervention for qualitative analysis.</p>	<p>Results at both centres suggest that LKM was associated with large-sized effects on self-reported symptoms of depression (d = 3.33 and 1.90), negative affect (d = 1.98 and 0.92), and positive affect (d = 1.63 and 0.94).</p> <p>Large effects were also found for clinician-reported changes in depression, rumination and specific positive emotions, and moderate effects for changes in adaptive emotion regulation strategies.</p> <p>This study offered key qualitative data analyses that provide additional support for the potential clinical use of LKM intervention.</p>
<p>Zeng et al., 2015</p> <p><i>The Effect of Loving-Kindness Meditation on Positive Emotions: A Meta-analytic Review</i></p>	<p>Focus: To systematically review the suggestion that loving-kindness meditation (LKM) is an effective practice for promoting positive emotions.</p> <p>Methodology Approach: A systematic review of 24 empirical studies (n = 1759) on LKM with self-reported positive emotions. The effect of LKM on positive emotions was estimated with meta-analysis, and the influence of variations across LKM interventions was further explored in this study with subgroup analysis and meta-regression.</p>	<p>The meta-analysis concluded, firstly, that there were medium effect sizes for LKM interventions on daily positive emotions in both waitlist controlled RCTs and non-RCT studies; and secondly, small to large effect sizes for the on-going practice of LKM on immediate positive emotions across different comparisons.</p> <p>In addition, further analysis found that interventions focused on loving-kindness had medium effect sizes, but interventions focused on compassion showed small effect sizes. Regardless of the length of interventions and the time spent on meditation, which did not influence the effect sizes.</p> <p>In summary, the study found LKM practice and interventions are effective in enhancing positive emotions.</p>

<p>Kerr et al., 2015.</p> <p><i>Can Gratitude and Kindness Interventions Enhance Well-Being in a Clinical Sample?</i></p>	<p>Focus: The aim of this study was to examine the effects of 2-week self-administered gratitude and kindness interventions within a clinical sample on a waiting-list for outpatient psychological treatment.</p> <p>Methodology Approach: This research study was grounded in Fredrickson’s (1998) broaden-and-build model of positive emotions. The study examined the effects of gratitude interventions on various types of psychological issues.</p> <p>Participants: Client difficulties included depression, anxiety, and PTSD, as well as substance use and eating disorders. Individuals were randomised to either record up to five things they felt grateful for in the past day for 14 days, or to keep a daily mood diary in the control group.</p>	<p>Results demonstrated that both the gratitude and kindness interventions built a sense of connectedness, enhanced satisfaction with daily life, increased optimism, and reduced anxiety compared to a placebo condition.</p> <p>These findings demonstrate that gratitude and kindness have a place in clinical practice; not just as end states, but as emotional experiences that can stimulate constructive change.</p>
<p>Cregg & Cheavens, 2020.</p> <p><i>Gratitude Interventions: Effective Self-Help? A Meta-Analysis of the Impact on Symptoms of Depression and Anxiety</i></p>	<p>Focus: The focus of this study was to examine the efficacy of gratitude interventions in reducing symptoms of depression and anxiety at post-test and follow-up periods.</p> <p>Methodology Approach: A Meta-analysis, that examined the efficacy of gratitude interventions. The study searched four databases for studies investigating the effects of gratitude interventions on symptoms of depression and anxiety (Cochrane Libraries, PsycINFO, PubMed, and Web of Science).</p>	<p>The authors concluded that the effects of gratitude interventions on symptoms of depression and anxiety are relatively modest and therefore cannot be characterised as significant in reducing depression and anxiety. The researchers therefore recommended that patients seeking to reduce symptoms of depression and anxiety should participate in interventions with significant evidence of efficacy for these symptoms.</p>
<p>Cunha et al., 2019.</p> <p><i>Positive Psychology & Gratitude Interventions: A Randomized Clinical Trial.</i></p>	<p>Focus: The aim and working hypothesis of this study was to assess the effect that a gratitude intervention had on a community sample of adults, on their well-being and mental health.</p> <p>Methodology Approach: An epidemiological study. The study carried out a randomised clinical trial that was conducted with (n=1,337) participants. A blind, randomised clinical trial was performed for assessing outcomes, with a gratitude intervention group and two control groups: hassles and neutral events.</p>	<p>The gratitude intervention managed to increase positive affect, subjective happiness and life satisfaction, and reduce negative affect and depression symptoms. This change was greater than the changes in the control groups in relation to positive affect. In the other outcomes analysed, similar changes were observed in the gratitude intervention and the neutral events intervention.</p> <p>Overall, the most significant changes observed in the Gratitude group were related to the emotional dimension of subjective well-being (increase in positive affect).</p>

	<p>Pre- and post-intervention measures were used, before and 14 days after the end of the intervention.</p> <p>Depression scale (CES-D), Subjective happiness scale (SHS), and satisfaction with life scale (SWLS) were used.</p> <p>Participants: Three groups of participants in total, composed of an intervention group (gratitude group, n = 446), and two control groups (hassles group, n = 444 and neutral events group, n = 447).</p> <p>Participants assigned to the gratitude intervention group were asked to write daily gratitude lists for 14 days, listing moments they had been grateful for during the day. The outcomes analysed were affect, depression, happiness and life satisfaction.</p>	
<p>Petrocchi & Couyoumdjian, 2015</p> <p><i>The impact of gratitude on depression and anxiety: the mediating role of criticizing, attacking, and reassuring the self.</i></p>	<p>Focus: The aim of the study was to evaluate possible mediation models for the relationship between gratitude and symptoms of depression and anxiety.</p> <p>Methodology Approach: Specifically, they tested three types of “self-to-self” relationships as possible mediators: self-criticising, self-attacking, and self-reassuring, as assessed by the Forms of Self-criticising/attacking and Self-reassuring Scale (FSCRS).</p> <p>Participants: N=410 Italian participants were assessed using three types of self-relating processes as possible mediators of this relationship; trait gratitude, depression, anxiety, and three forms of self-relating (criticising, attacking, and reassuring the self).</p>	<p>Gratitude predicted less depression and anxiety symptoms, and the three forms of self-relating partially mediated the impact of gratitude on both depression and anxiety.</p>
<p>Davis et al., 2016.</p> <p><i>Thankful for the little things: A meta-analysis of gratitude interventions.</i></p>	<p>Focus: The aim of this study was to carefully evaluate the efficacy of gratitude interventions. The study followed on from a recent qualitative review by Wood et al. (2010) and the doubts cast upon the effectiveness of gratitude interventions.</p> <p>Methodology Approach: A series of meta-analyses, relative to a measurement-only control or an alternative-activity condition, across three outcomes (gratitude, anxiety, psychological well-being).</p>	<p>Gratitude interventions outperformed a measurement-only control on measures of psychological well-being.</p> <p>In addition, gratitude interventions outperformed an activity-matched comparison.</p> <p>Gratitude interventions performed as well as, but not better than, a psychologically active comparison.</p> <p>The study concluded the need to be cautious about gratitude interventions being a moderately effective intervention for psychological conditions, as the effect sizes were marginal. Thus, the researchers</p>

	<p>The literature search involved a manual search of the references of prior reviews (e.g., Wood et al., 2010) on PsycINFO and Google Scholar. In total, 32 samples that met the inclusion criteria were used in the study.</p>	<p>suggested the need to consider how to strengthen effect sizes and examine evidence of specificity.</p>
<p>Wood et al., 2010.</p> <p><i>Gratitude and well-being: A review and theoretical integration.</i></p>	<p>Focus: The aim of the study was to present a new model of gratitude incorporating not only the gratitude that arises following help from others but also a habitual focusing on and appreciating of the positive aspects of life. Research into individual differences in gratitude and well-being is reviewed, including gratitude and psychopathology, personality, relationships, health, subjective and eudemonic well-being, and humanistically orientated functioning.</p> <p>Methodology Approach: Comprehensive Literature review on interventions to clinically increase gratitude.</p>	<p>The research review suggests that gratitude is related to a variety of clinically relevant phenomena, including psychopathology (particularly depression), adaptive personality characteristics, positive social relationships, and physical health (particularly stress and sleep).</p> <p>Longitudinal and experimental work suggests that the benefits of gratitude to well-being may be causal.</p> <p>Overall, the authors concluded that gratitude is relevant to clinical psychology due to (a) strong explanatory power in understanding well-being, and (b) the potential of improving well-being through fostering gratitude with simple exercises.</p>
<p>Bohlmeijer et al., 2021.</p> <p><i>Promoting Gratitude as a Resource for Sustainable Mental Health: Results of a 3-Armed Randomized Controlled Trial up to 6 Months Follow-up.</i></p>	<p>Focus: The aim of the current study was to evaluate the impact of a 6-week gratitude intervention for people with low to moderate well-being and moderate symptomatology of depression and anxiety; there was a 6-month follow-up.</p> <p>Methodology Approach: Repeated measures experiment that examined the changes in outcome measures over time. Multilevel growth curve modelling in R was used to account for repeated measures within individuals.</p> <p>Participants: N= 217 Dutch adults were randomly assigned to one of three conditions. Either a 6-week gratitude intervention, a 6-week self-kindness intervention as an active control condition, and a waitlist control condition.</p> <p>To measure any changes, the study asked the participants to complete online assessments of well-being, depression, anxiety and gratitude at baseline, post-test, 6 weeks and 6 months follow-up.</p>	<p>The gratitude intervention was more effective in improving mental well-being in comparison to the self-kindness intervention (d = .63 at post-intervention and d=.40 at 6 weeks follow-up) and waitlist control (d=.93 at post-intervention and d=.66 at 6 weeks follow-up).</p> <p>The data also demonstrated that the gratitude intervention was superior to waitlist control and practicing self-kindness on various measures of gratitude but not on distress. The results of this study suggest that a 6-week gratitude intervention is an effective, low-intensity intervention for enhancing mental well-being.</p> <p>The sustained effects on various measures of gratitude up to 6 months follow-up suggest that it is possible to promote a lasting appreciative perspective on life.</p>

5.1 Overview of Relevant Findings

5.1.1 The relevance of Loving-Kindness Meditation (LKM) in reducing anxiety symptoms and producing positive emotional states.

Although there are several older studies showing that mindfulness-based treatments effectively reduce many psychological problems (Grossman et al., 2004; Kabat-Zinn 2003; Khoury et al., 2013), there has been much interest recently in practices, such as Loving-Kindness Meditation (LKM), that offer comparable effects. The practice of LKM is derived from Buddhism and has been used for over 2500 years (Kornfield, 2002). Empirical studies on LKM have increased recently (see Galante et al., 2014, for review) and it is becoming a useful psychological intervention to treat mental health disorders and also to enhance positive emotions (Hofmann et al., 2011).

The core psychological operation of LKM is to encourage and train one's unconditional feelings of love, kindness, and acceptance to the self and others (Salzberg, 1995). Key research detailed in Table 5 has shown the effectiveness of LKM for reducing negative affect and improving positive affect in individuals with emotion dysregulation; it is successful in treating a variety of psychological problems, including anxiety and stress (Hutcherson et al., 2008; Hofmann et al., 2011; Totzeck et al., 2020). Hofmann et al., (2015) report that LKM is associated with significant changes in depression, rumination and positive emotions.

As described in Table 5, Fredrickson et al. (2008) showed that LKM led to significant shifts in positive emotions felt, followed by a reduction in depressive moods. Moreover, 15 months after the program ended, one in three participants who continued to meditate reported a further increase in positive emotions and well-being (Cohn & Fredrickson, 2010). However, Weibel et al. (2012) concluded, that the changes in anxiety after LKM intervention were not significantly different from the baseline scores, suggesting that enhancing positive affect via LKM may be a redundant step in treating anxiety. These discrepancies by the very least require ongoing exploration.

There have been some interesting but vague connections between PPI practices and the state of coherence. For example, McCraty et al. (2003) state that the positive emotions created using LKM are associated with increased emotional regulation over time, leading to coherence within the body. Kok et al. (2013) expanded this and found that improved vagal tone was a response to LKM.

Collectively, studies indicate that LKM improves health and well-being and is an effective intervention. It appears to be effective in two main ways: it leads to an increase in positive affect, and it is useful in treating psychological problems, such as anxiety, depression and stress. However, more empirical research is needed on this topic (Wallace & Shapiro, 2006) the nature and extent of its effects remain largely unknown to science.

5.1.2 The relevance of Gratitude Practices in reducing anxiety symptoms and producing positive emotional states.

Gratitude activities strive to evoke feelings of appreciation towards someone or something that is responsible for creating positive events or feelings in one's life (Schueller & Parks, 2014). Recent research has shown that gratitude is associated with several aspects of well-being and positive affect (Davis et al., 2016; Cunha et al., 2019; Watkins, 2014; Wood et al., 2010) and also has a modest effect in reducing psychological disorders – particularly anxiety and depression (Cregg & Cheavens, 2020; Kerr et al., 2015; Petrocchi & Couyoumdjian, 2015; Wood et al., 2010).

Additional clinical studies show that gratitude practices lead to constructive change. Kerr et al., (2015) showed that gratitude interventions reduce anxiety and improve connectiveness, while Cunha et al. (2019) found that they were able to increase positive affect and reduce the negative effects of depressive symptoms. Following the findings in studies such as these, gratitude interventions are now seen as a clinically relevant and effective technique for increasing appreciation of positive qualities.

However, some limitations need to be noted. Bohlmeijer et al. (2020) found that gratitude practices were only effective for improving stress and anxiety, and not for depressive symptoms. Cregg and Cheavens (2020) also found the effects of gratitude practices to be modest when treating the symptoms of depression. These findings are consistent with meta-analyses conducted by Dickens (2017) who suggests that gratitude interventions can benefit individual subjective well-being, happiness, life satisfaction, and positive affect, but their effects on depression, stress and negative affect are unclear.

In an updated review by Beken et al. (2019) the authors concluded that gratitude interventions moderately benefit mental well-being but are less effective in issues of psychological well-being and do not necessarily reduce the symptoms of psychopathology. Davis et al. (2016)

reached a similar conclusion and expressed uncertainty about the significance of gratitude interventions in mental health recovery – as a stand-alone treatment.

These ambiguous findings may indicate that gratitude practices will be more effective when paired with other, activity-based interventions (Cregg & Cheavers, 2020), such as those proposed for the HLC Programme. In conclusion, it is anticipated that gratitude interventions will offer an element of subjective well-being, an enhanced awareness of positive qualities, improved social connection, and the possible improvement of psychological well-being - particularly for anxiety sufferers (Seligman et al., 2005).

Chapter 6

The Importance of a Therapeutic Delivery when Working with Heart-led Interventions

Given that the main goal of the HLC Programme is to help a person build positive emotional states, activate psychophysiological coherence and reduce anxiety symptoms, the context of delivery is a significant factor. Essentially, the nature of delivery is the underpinning of any programme's therapeutic effectiveness.

The main goal of any therapeutic modality, including counselling, is to promote human empowerment and a greater level of well-being (Lalande, 2004). Humanists share the same goal as proponents of Positive Psychology: to nurture the positive side of human nature that has a tendency to self-actualise (Hansen, 2006; Maslow, 1968). Seligman and Csikszentmihalyi (2000) suggest that Positive Psychology has the same goals as counselling, namely promoting human flourishing, and that both approaches are optimised when delivered within a therapeutic relationship. From a humanistic approach, Rogers (1957) suggested that therapeutic success depends on creating the right relationship, within a counselling or psychotherapy setting, for personal growth. This makes the relationship between participant and practitioner a key element to psychological recovery.

Many counselling psychotherapists already use aspects of Positive Psychology in their practices (Joseph & Liney, 2006) and combine humanistic approaches while delivering PPIs (Lopez & Edwards, 2008). This has shown significant benefits for patient recovery (Scheel et al., 2012). In addition, HeartMath interventions are actively utilised in several therapeutic settings (Table 3). A study by Lutz (2014) showed that when clinicians used HeartMath interventions in therapy with traumatised children, the HeartMath emotion-regulation techniques helped most of the patients to regulate their emotions.

It is clear that counselling, PPIs and heart-led interventions share the key focus of wellness. The overlap between them is an advantage for the proposed HLC Programme, as these traditions will be delivered and work together within the Programme. Gelso and Woodhouse (2003) believe the call for such integrations in overlapping therapy has been long-standing, and this presents an opportunity to explore the "unity" of a new paradigm.

The expectation of this current study is that the use of PPIs (LKM and gratitude) along with heart-led interventions and a humanistic voice, will facilitate a structure for change in a patient suffering from anxiety. The personal experiences of the interventions will match a person-centred understanding within the therapy sessions. This means that by creating an open environment while delivering the HLC Programme, a practitioner will allow patients to connect with their own experience while building the effects of coherence (Geller & Greenberg, 2002). The envisaged end result will be increased positive affect, psychophysiological coherence and the reduction of anxiety symptoms.

Chapter 7

Discussion of Findings

The research collected and evaluated in this study has led to a deeper understanding of the significance of the psychological and physiological effects of a balanced heart-brain relationship. These scientific studies indicate the significance of the heart-brain connection in optimal mental health and well-being. In addition, research shows that heart activity affects mental clarity, creativity, emotional balance, intuition and personal effectiveness. Essentially, the consensus is that the heart is a source of rhythmic information patterns that impact a person's physiological, cognitive, and emotional systems. However, these findings are relatively unknown outside the world of psychophysiology. It is hoped that this field of scientific endeavour will soon lead to further understanding of how and why the heart-brain connection is so powerful in human functioning.

The research further supports the role of the ANS in the interaction between the heart and brain. It indicates that the heart responds to emotion via ANS activity and also generates signals that play a significant part in determining the quality of a person's emotional experiences. Similarly, published research indicates the importance of PNS activation as a factor for promoting coherence and reducing symptoms of anxiety. The research by HeartMath scientists signposts HRV as being responsible for the shifts in balance between PNS and SNS, which then are responsible for a cascade response (psychologically and physiologically) and the felt experience of positive and negative emotions.

The reviewed research also indicated that positive emotional states are a fundamental element through which a person can activate a healthy change in HRV as well as a coherent state. The higher the HRV, the more psychological adaptability is present and, therefore, the less the chance of anxiety. The literature also concluded that the experience of positive emotion allows the coherence mode to emerge naturally within the body. When positive emotions are used to attain coherence, a transformation in psychophysiological function occurs. Studies link this with the activation of the PNS, that supports the experience of connectedness, harmony and balance, and a transformation to physical, emotional, and psychosocial well-being. This transformation results in improved physiological efficiency, emotional stability, and cognitive function, equipping a person to overcome anxiety. The heart may indeed provide an access point from which a change in system-wide function can be effected.

Since the literature supported the relevance of positive emotional states in inducing coherence, it is key to understand how a patient may build quality positive emotions. Studies confirmed the effectiveness of both PPIs (LKM and gratitude) in improving positive affect, making these interventions suitable for inclusion in the HLC Programme. Although some studies did describe limitations for both PP strategies, the overwhelming consensus was that there is a need for these PP strategies, particularly LKM, to be used in clinical settings to reduce stress and improve well-being.

The review of the HeartMath Institute interventions confirmed their usefulness in helping patients with anxiety. These studies confirmed the appropriateness of including HeartMath interventions in the HLC Programme. Overall, the findings suggest that these techniques are successful in treating many different conditions, including chronic and mild anxiety, in both clinical and non-clinical settings.

It can be challenging for a patient to use these self-regulation interventions, as they require effort and perseverance. Thus, a supportive approach is important for delivering these heart-led interventions. The current literature review supported the combination of a humanistic approach with the delivery of interventions, and identified the benefits for patient recovery. Furthermore, ongoing support from a therapeutic relationship can enhance success, particularly when it is grounded within the theory of human connection and personal development. Psychologists and counsellors can therefore play a role in applying these interventions in professional therapeutic relationships and contexts.

In conclusion, this review of literature confirmed that the use of heart-led interventions, in a structured programme, may support a person in achieving psychophysiological coherence and activating a connective state. Positive emotions produced from these focused practices will help to build a person's positive repertoire and personal resources. By learning the skill to shift from a survival state into a heart-centred state of positivity, a person can eliminate the limiting effects associated with anxiety. To this end, the researcher presents a proposed outline of the HLC programme (see Table 6 and Figure 5) with further advancements to be foreseen.

Table 6:

The Proposed HLC Programme Outline

Overall Outline: This Programme will combine in unity heart-brain coherence interventions; such as based on HeartMath Institute and PP strategies (*gratitude and LKM*). Both types of interventions will be delivered through a therapeutic nature, utilising a humanistic counselling approach as one Programme formation. With the overall purpose is to assist moderate anxiety suffers in achieving a coherence state and effectively build balanced communication between the heart and brain. The following framework offers suggestions upon how the HLC programme will be structured; grounded upon the inclusion of literature research reviewed in this study.

The three-pillar approach: The Programme makes use of a three-pillar approach. Under the pillar of heart-brain interventions, three different practices will be used. Two well-researched PPIs (gratitude and LKM) form the second pillar of the Programme's structure. The total *five* interventions aim to promote coherence within the body and reduce moderate anxiety levels. The proposed Programme will also be delivered utilising a therapeutic counselling structure, which represents the third pillar of the Programme (Figure 5).

Figure 5:

The HLC Programmes three-pillar approach

1: HeartMath Institute Interventions

- Stress Relief: The Freeze-frame Technique
- Inner-Ease™ Technique
- The Quick Coherence®

2: Positive Emotional State producers (PPI)

- Loving-Kindness Meditation (LKM)
- Gratitude Practices

3: The Delivery Context

- Five interventions are centered within a therapeutic structure.
- A person-centred approach that holds a fundamental humanistic framework.

(Appendix 2 and 3 outline additional detailed phases and rationale of the HLC Programme).

7.1 Methodological Limitations

This literature review provided the building blocks for the development and formation of the new treatment Programme, as well as helping to identify areas for further advancement. However, the researcher had a preconceived idea about which interventions should be used in the Programme because of her previous experience in the field of counselling people with mental illness. This meant that research studies relating to these interventions in particular were analysed and confirmation bias (Moher et al., 2009) became an obvious and potentially serious pitfall. In seeking studies that answered the research questions set out in Chapter 2.2, it was easy to include affirmative results and ignore findings that were negative. As the research methodology was guided by personal and epistemological reflexivity, it was vital to be aware of the inherent bias running through the selection of literature (Willig, 2001). To counter this, the researcher recorded her thoughts throughout the research process, to identify any underlying bias. However, even this did not eliminate all potential bias, as the researcher still provided her own interpretations of the research studies cited.

Another limitation was the lack of supportive evidence from independent studies. The majority of evidence either emanated from HeartMath Institute scientists, or linked back to research done by these scientists. This focus on information from one main source could lead to a lack of validity (Childs, 2019). Since the HeartMath Institute also runs a large commercial enterprise selling its workshops, courses and equipment to the public, it is possible that their research is informed by their own agenda. The majority of studies used in this review were published in peer-reviewed journals and books, with the understanding that the peer-review process reduces the chances of invalid research being published. In addition, independent studies by non-HeartMath scientists were presented wherever possible, and did evidence support for the research questions posed by this researcher.

The use of complex technical language and concepts in publications was also a potential limitation. It was often difficult to break down this language to provide an adequate understanding of the topics, particularly in the medical fields. It is possible that this limited understanding of the topics was an obstacle. However, the researcher has knowledge and extensive experience in the field of psychotherapy, and this did help profoundly when considering the implications of mental health imbalance. In addition, the angle of the proposed Programme played to the researcher's strengths in terms of Positive Psychology and therapeutic relationship and delivery, as these are related to her professional focus.

The study's key research questions helped keep a logical focus while searching the huge field of literature. The disadvantage of a literature review, however, is that it does not make use of primary data and so there is no quantitative science or statistical evidence with which to evaluate the effectiveness of the proposed Programme. It is foreseen, however, that such quantitative evaluation and statistical analysis will be undertaken in the future, once the Programme is implemented (see Appendix 2).

Despite these potential limitations, it is hoped that the present study will contribute further momentum towards creating balance and harmony for anxiety symptoms. The field has seen rapid progress in applied research and heart-focused interventions in recent times, and results have indicated that the relationship between heart and brain is truly intelligent – beyond what was once thought. This insight has bearing on the current standards for clinical psychotherapy and mental illness recovery.

References

- An, E., Nolty, A., Amano, S., Rizzo, A., Buckwalter, J., & Rensberger, J. (2019). Heart rate variability as an index of resilience. *Military Medicine*, *185*(3-4), 363–369. <https://doi.org/10.1093/milmed/usz325>
- Appelhans, B. M., & Luecken, L. J. (2006). Heart rate variability as an index of regulated emotional responding. *Review of general psychology*, *10*(3), 229–240.
- Armour, J. A. (1991). Intrinsic cardiac neurons. *Journal of Cardiovascular Electrophysiology*, *2*(4), 331–341. <https://doi.org/10.1111/j.1540-8167.1991.tb01330.x>
- Armour, J. A. (2007). The little brain on the heart. *Cleveland Clinic Journal of Medicine*, *1*(74), 848-851.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*, 27–45. <https://doi.org/10.1177/1073191105283504>
- Barrios-Choplin, B., McCraty, R., & Cryer, B. (1997). An inner quality approach to reducing stress and improving physical and emotional wellbeing at work. *Stress Medicine*, *13*(3), 193–201. [https://doi.org/10.1002/\(SICI\)1099-1700\(199707\)13:3<193::AID-SMI744>3.0.CO;2-I](https://doi.org/10.1002/(SICI)1099-1700(199707)13:3<193::AID-SMI744>3.0.CO;2-I)
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*(4), 323–370. <https://doi.org/10.1037/1089-2680.5.4.323>
- Beck, A.T., Epstein, N., Brown, G., & Steer, R.A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*, 893–897. <https://doi.org/10.1037//0022-006x.56.6.893>
- Bedell, W., & Kaszkin-Bettag, M. (2010). Coherence and health care cost – RCA actuarial study: A cost-effectiveness cohort study. *Alternative Therapies in Health and Medicine*, *16* (4), 26–31.
- Beken J. L., Jacobs. N., Janssens, M., Peeters, S., Reijnders, J., Lechner, L., & Lataster, J. (2019). Gratitude and health: An updated review. *The Journal of Positive Psychology*, DOI: 10.1080/17439760.2019.1651888
- Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: a meta-analysis of randomized controlled studies. *BMC Public Health*, *13*, 119. <https://doi.org/10.1186/1471-2458-13-119>
- Bolte, A., Goschke, T., & Kuhl, J. (2003). Emotion and intuition: Effects of positive and negative mood on implicit judgments of semantic coherence. *Psychological Science*, *14*(5), 416–421. <https://doi.org/10.1111/1467-9280.01456>
- Bradley, R. T., McCraty, R., Atkinson, M., Arguelles. L., Rees, R. A., & Tomasino, D. (2007). Reducing test anxiety and improving test performance in America’s schools: Results from the Test Edge national demonstration study. Heart-Math Research Center, Institute of HeartMath, Report No. 07-04-01.
- Bradley, R. T., McCraty, R., Atkinson, M., Tomasino, D., Daugherty, A., & Arguelles, L. (2010). Emotion self-regulation, psychophysiological coherence, and test anxiety: Results from an experiment using electrophysiological measures. *Applied Psychophysiology and Biofeedback*, *35*(4), 261-283. <https://doi.org/10.1007/s10484-010-9134-x>

- Bohlmeijer, E. T., Kraiss, J. T., Watkins, P., & Schotanus-Dijkstra, M. (2021). Promoting gratitude as a resource for sustainable mental health: Results of a 3-armed randomized controlled trial up to 6 months follow-up. *Journal of Happiness Studies*, 22(3), 1011–1032. <https://doi.org/10.1007/s10902-020-00261-5>
- Burns, A. B., Brown, J. S., Sachs-Ericsson, N., Ashby Plant, E., Thomas Curtis, J., Fredrickson, B. L., & Joiner, T. E. (2008). Upward spirals of positive emotion and coping: Replication, extension, and initial exploration of neurochemical substrates. *Personality and Individual Differences*, 44(2), 360–370. <https://doi.org/10.1016/j.paid.2007.08.015>
- Burg, J. M., & Wolf, O. T. (2012). Mindfulness as self-regulated attention: Associations with heart rate variability. *Swiss Journal of Psychology*, 71(3), 135–139. <https://doi.org/10.1024/1421-0185/a000080>
- Cacioppo, J. T., Cacioppo, S., & Gollan, J. K. (2014). The negativity bias: Conceptualization, quantification, and individual differences. *Behavioral and Brain Sciences*, 37(3), 309–310. <https://doi.org/10.1017/S0140525X13002537>
- Cannon, W. B. (1929). *Bodily changes in pain, hunger, fear and rage* (2nd ed.). D. Appleton & Co.
- Chalmers, J., Heathers, J. A. J., Abbott, M. J., Kemp, A. H., & Quintana, D. S. (2016). Worry is associated with robust reductions in heart rate variability: a transdiagnostic study of anxiety psychopathology. *BioMed Central Psychology* 4(32), Article 32. <https://doi.org/10.1186/s40359-016-0138-z>
- Chaves, C., Lopez-Gomez, I., Hervas, G., & Vazquez, C. (2017). A comparative study on the efficacy of a positive psychology intervention and a cognitive behavioral therapy for clinical depression. *Cognitive Therapy and Research*, 41(3), 417–433. <https://doi.org/10.1007/s10608-016-9778-9>
- Cheavens, J. S., Feldman, D. B., Gum, A., Michael, S. T., & Snyder, C. R. (2006). Hope therapy in a community sample: A pilot investigation. *Social Indicators Research*, 77(1), 61–78. <https://doi.org/10.1007/s11205-005-5553-0>
- Childre, D. (2010). *The state of ease*. HeartMath Institute. <https://www.heartmath.org/resources/downloads/the-state-of-ease-e-book>
- Childre, D. L., Martin, H., & Beech, D. (1999). *The HeartMath solution*(1st ed). HarperSanFrancisco.
- Childre, D., & Martin, H. (2011). *The HeartMath solution: The Institute of HeartMath's revolutionary program for engaging the power of the heart's intelligence*. Harper Collins.
- Childre, D., Martin, H., & Beech, D. (1999). *The HeartMath solution*. Harper Collins.
- Childre, D., Martin, H., Rozman, D., & McCraty, R. (2016). *Heart intelligence: Connecting with the intuitive guidance of the heart*. Waterfront Press.
- Childs, D. (2019). What Makes Valid Research? How to verify if a source is credible on the Internet.; Democracy & me; Cincinnati Public Radio Outreach Project. <https://www.democracyandme.org/what-makes-valid-research-how-to-verify-if-a-source-is-credible-on-the-internet/>
- Cohn, M. A., & Fredrickson, B. L. (2009). Positive emotions. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (pp. 13–24). Oxford University Press.

- Cohn, M. A., & Fredrickson, B. L. (2010). In search of durable positive psychology interventions: Predictors and consequences of long-term positive behavior change. *The journal of positive psychology*, 5(5), 355–366. <https://doi.org/10.1080/17439760.2010.508883>
- Coyne, J. C. (2015). Lucrative pseudoscience at the International Positive Psychology Association meeting. *The Seattle Star* <https://www.seattlestar.net/2015/07/lucrative-pseudoscience-at-the-international-positive-psychology-association-meeting/>
- Cregg, D. & Cheavens, J. (2020). Gratitude Interventions: Effective self-help? A meta-analysis of the impact on symptoms of depression and anxiety. *Journal of happiness studies*. 22. 1-33. 10.1007/s10902-020-00236-6.
- Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (Eds.). (2006). *A life worth living: Contributions to positive psychology*. Oxford University Press.
- Cunha, L. F., Pellanda, L. C., & Reppold, C. T. (2019). Positive psychology and gratitude interventions: A randomized clinical trial. *Frontiers in Psychology*, 10, 584. <https://doi.org/10.3389/fpsyg.2019.00584>
- Dana, D. (2018). *The polyvagal theory in therapy: Engaging the rhythm of regulation* (First edition). W.W. Norton & Company.
- Darwin, C. (1872). *The expression of the emotions in man and animals*. John Murray. <https://doi.org/10.1037/10001-000>
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., Urbanowski, F., Harrington, A., Bonus, K., & Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65(4), 564–570. <https://doi.org/10.1097/01.PSY.0000077505.67574.E3>
- Davis, D.E., Choe, E., Meyers, J., Wade, N., Varjas, K., Gifford, A.Z., Quinn, A., Hook, J., Tongeren, D.V., Griffin, B.J., & Worthington, E. (2016). Thankful for the little things: A meta-analysis of gratitude interventions. *Journal of counseling psychology*, 63 1, 20-31 .
- Dekker, J. M., Schouten, E. G., Klootwijk, P., Pool, J., Swenne, C. A., & Kromhout, D. (1997). Heart rate variability from short electrocardiographic recordings predicts mortality from all causes in middle-aged and elderly men: The Zutphen study. *American Journal of Epidemiology*, 145(10), 899–908. <https://doi.org/10.1093/oxfordjournals.aje.a009049>
- Dickens, L. R. (2017). Using gratitude to promote positive change: A series of meta-analyses investigating the effectiveness of gratitude interventions. *Basic and Applied Social Psychology*, 39(4), 193–208. <https://doi.org/10.1080/01973533.2017.1323638>
- Diedrich, A., Grant, M., Hofmann, S. G., Hiller, W., & Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behaviour research and therapy*, 58, 43-51.
- Economides, M., Lehrer, P., Ranta, K., Nazander, A., Hilgert, O., Raevuori, A., ... & Forman-Hoffman, V. L. (2020). Feasibility and efficacy of the addition of heart rate variability biofeedback to a remote digital health intervention for depression. *Applied psychophysiology and biofeedback*, 45(2), 75-86.
- Edwards, S. D. (2016). Influence of HeartMath Quick Coherence Technique on psychophysiological coherence and feeling states. *African Journal for Physical Activity and Health Sciences (AJPHEs)*, 22(41), 1006-1018.

- Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating pleasant emotions. *Cognition & Emotion*, 2(4), 301–331. <https://doi.org/10.1080/02699938808412702>
- Farias, M., & Wikholm, C. (2016). Has the science of mindfulness lost its mind? *BJPsych Bulletin*, 40(6), 329–332. <https://doi.org/10.1192/pb.bp.116.053686>
- Flückiger, C., & Grosse Holtforth, M. (2008). Focusing the therapist's attention on the patient's strengths: A preliminary study to foster a mechanism of change in outpatient psychotherapy. *Journal of Clinical Psychology*, 64(7), 876–890. <https://doi.org/10.1002/jclp.20493>
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300–319. <https://doi.org/10.1037/1089-2680.2.3.300>
- Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 359(1449), 1367–1377. <https://doi.org/10.1098/rstb.2004.1512>
- Fredrickson, B. L. (2008). Promoting positive affect. *The science of subjective well-being*, 449–468. New York: Guilford Press.
- Fredrickson, B. (2009). *Positivity* (1st ed). Crown Publishers.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition & Emotion*, 19(3), 313–332. <https://doi.org/10.1080/02699930441000238>
- Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of personality and social psychology*, 95(5), 1045.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science*, 13(2), 172–175. <https://doi.org/10.1111/1467-9280.00431>
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist*, 60(7), 678–686. <https://doi.org/10.1037/0003-066X.60.7.678>
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of personality and social psychology*, 84(2), 365.
- Frijda, N. H. (1986). *The emotions*. Cambridge University Press.
- Galante, J., Galante, I., Bekkers, M. J., & Gallacher, J. (2014). Effect of kindness-based meditation on health and well-being: a systematic review and meta-analysis. *Journal of consulting and clinical psychology*, 82(6), 1101.

- Geller, S. M., & Greenberg, L. S. (2002). Therapeutic presence: Therapists' experience of presence in the psychotherapy encounter. *Person-Centered and Experiential Psychotherapies*, 1(1–2), 71–86. <https://doi.org/10.1080/14779757.2002.9688279>
- Gelso, C. J., & Woodhouse, S. (2003). Toward a positive psychotherapy: Focus on human strength. In B. W. Walsh (Ed.), *Counseling psychology and optimal human functioning* (pp. 171-197). Mahwah, NJ: Lawrence Erlbaum Associates.
- Ginsberg, J. P., Berry, M. E., & Powell, D. A. (2010). Cardiac coherence and posttraumatic stress disorder in combat veterans. *Alternative Therapies in Health & Medicine*, 16(4).
- Goleman, D. (1998). The emotional intelligence of leaders: The emotional intelligence of leaders. *Leader to Leader*, 1998(10), 20–26. <https://doi.org/10.1002/ltl.40619981008>
- Greeson, J. M., Smoski, M. J., Suarez, E. C., Brantley, J. G., Ekblad, A. G., Lynch, T. R., & Wolever, R. Q. (2015). Decreased symptoms of depression after mindfulness-based stress reduction: Potential moderating effects of religiosity, spirituality, trait mindfulness, sex, and age. *The Journal of Alternative and Complementary Medicine*, 21(3), 166–174. <https://doi.org/10.1089/acm.2014.0285>
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of psychosomatic research*, 57(1), 35-43.
- Hansen, J. T. (2006). Humanism as moral imperative: Comments on the role of knowing in the helping encounter. *The Journal of Humanistic Counseling, Education and Development*, 45(2), 115-125.
- Hefferon, K., & Boniwell, I. (2011). *Positive psychology: Theory, research and applications*. McGraw-Hill Education.
- Hirsch, J. A., & Bishop, B. (1981). Respiratory sinus arrhythmia in humans: how breathing pattern modulates heart rate. *American Journal of Physiology-Heart and Circulatory Physiology*, 241(4), H620-H629.
- Hirsch, J. A., Bishop, B., & York, J. (1996). Role of parasympathetic (Vagal) cardiac control in elevated heart rates of smokers. *Addiction Biology*, 1(4), 405–413. <https://doi.org/10.1080/1355621961000125026>
- Ho, H. C. Y., Yeung, D. Y., & Kwok, S. Y. C. L. (2014). Development and evaluation of the positive psychology intervention for older adults. *The Journal of Positive Psychology*, 9(3), 187–197. <https://doi.org/10.1080/17439760.2014.888577>
- Hofmann, S. G., Grossman, P., & Hinton, D. E. (2011). Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical Psychology Review*, 31(7), 1126–1132. <https://doi.org/10.1016/j.cpr.2011.07.003>
- Hofmann, S. G., Petrocchi, N., Steinberg, J., Lin, M., Arimitsu, K., Kind, S., Mendes, A., & Stangier, U. (2015). Loving-kindness meditation to target affect in mood disorders: A proof-of-concept study. *Evidence-Based Complementary and Alternative Medicine*, 2015, 1–11. <https://doi.org/10.1155/2015/269126>
- Hofmann, S. G., Sawyer, A. T., Fang, A., & Asnaani, A. (2012). Emotion dysregulation model of mood and anxiety disorders. *Depression and Anxiety*, 29(5), 409–416.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78(2), 169–183. <https://doi.org/10.1037/a0018555>

- Huffman, J. C., DuBois, C. M., Healy, B. C., Boehm, J. K., Kashdan, T. B., Celano, C. M., Denninger, J. W., & Lyubomirsky, S. (2013). Feasibility and utility of positive psychology exercises for suicidal inpatients. *General Hospital Psychiatry, 36*(1), 88–94. <https://doi.org/10.1016/j.genhosppsych.2013.10.006>
- Hutcherson, A., Seppala, E. M., & Gross, J. J. (2008). Loving-kindness meditation increases social connectedness. *Emotion, 8*(5), 720–724.
- Immordino-Yang, M. H., & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain, and Education, 1*(1), 3–10. <https://doi.org/10.1111/j.1751-228x.2007.00004.x>
- Isen, A. M. (1999). On the relationship between affect and creative problem solving. In S. W. Russ (Ed.), *Affect, creative experience, and psychological adjustment* (pp. 3–17). Taylor & Francis.
- Jasubhai, Shilpa. (2021). Effect of quick coherence technique on psychophysiological coherence, heart rate, stress, anxiety, depression and feeling state in young adults in India. *Journal of Psychology and Neuroscience, 10.47485/2693-2490.1042*.
- Joseph, S., & Linley, P. A. (2006). Growth following adversity: theoretical perspectives and implications for clinical practice. *Clinical psychology review, 26*(8), 1041–1053. <https://doi.org/10.1016/j.cpr.2005.12.006>
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. Hyperion.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144–156. <https://doi.org/10.1093/clipsy.bpg016>
- Kabat-Zinn, J. (1991). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. Delta Publishers.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144–156.
- Kamath, M. V., Watanabe, M. A., & Upton, A. R. M. (Eds.). (2013). *Heart rate variability (Hrv) signal analysis: Clinical applications*. Taylor & Francis.
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review, 30*(7), 865–878. <https://doi.org/10.1016/j.cpr.2010.03.001>
- Keng, S-L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review, 31*(6), 1041–56.
- Kerr, S. L., O'Donovan, A., & Pepping, C. A. (2015). Can gratitude and kindness interventions enhance well-being in a clinical sample? *Journal of Happiness Studies, 16*(1), 17–36. <https://doi.org/10.1007/s10902-013-9492-1>
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M.-A., Paquin, K., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Kiken, L. G., & Fredrickson, B. L. (2017). Cognitive aspects of positive emotions: A broader view for well-being. In M. D. Robinson & M. Eid (Eds.), *The Happy Mind: Cognitive*

- Contributions to Well-Being*(pp. 157–175). Springer International Publishing.
https://doi.org/10.1007/978-3-319-58763-9_9
- Ko, Y., & Hyun, M. (2015). Effects of a positive psychotherapy program on depression, self-esteem, and hope in patients with major depressive disorders. *Journal of Korean Academy of Psychiatric and Mental Health Nursing*, *24*, 246-256.
- Kornfield, J. (2002). *The art of forgiveness, lovingkindness, and peace*. Bantam Books.
- Kuyken, W., Hayes, R., Barrett, B., Byng, R., Dalgleish, T., Kessler, D., Lewis, G., Watkins, E., Brejcha, C., Cardy, J., Causley, A., Cowderoy, S., Evans, A., Gradinger, F., Kaur, S., Lanham, P., Morant, N., Richards, J., Shah, P., ... Byford, S. (2015). Effectiveness and cost-effectiveness of mindfulness-based cognitive therapy compared with maintenance antidepressant treatment in the prevention of depressive relapse or recurrence (Prevent): A randomised controlled trial. *The Lancet*, *386*(9988), 63–73.
[https://doi.org/10.1016/S0140-6736\(14\)62222-4](https://doi.org/10.1016/S0140-6736(14)62222-4)
- Lacey, B. C., & Lacey, J. I. (1974). Studies of heart rate and other bodily processes in sensorimotor behavior. In P. A. Obrist, A. H. Black, J. Brener, & L. V. DiCara (Eds.), *Cardiovascular Psychophysiology* (pp. 538-564). Aldine.
- Lacey, B. C., & Lacey, J. I. (1978). Two-way communication between the heart and the brain: Significance of time within the cardiac cycle. *American Psychologist*, *33*(2), 99-113. <https://doi.org/10.1037/0003-066X.33.2.99>
- Lalande, V. (2004). Counselling psychology: A Canadian perspective. *Counselling Psychology Quarterly* *17*, 273–286. <https://doi.org/10.1080/09515070412331317576>
- Lambert, L., & Pasha-Zaidi, N. (2014). Positive psychology interventions: A review for counselling practitioners. *Canadian Journal of Counselling and Psychotherapy*, *48*(4), 383–408
- Lambert D'raven, L. T., Moliver, N., & Thompson, D. (2015). Happiness intervention decreases pain and depression, boosts happiness among primary care patients. *Primary health care research & development*, *16*(2), 114–126.
<https://doi.org/10.1017/S146342361300056X>
- Lazarus, A. A. (1994). How certain boundaries and ethics diminish therapeutic effectiveness. *Ethics & Behavior* *4*, 255–261.
- Lehrer, P. M., & Gevirtz, R. (2014). Heart rate variability biofeedback: how and why does it work? *Frontiers in Psychology* *5*. <https://doi.org/10.3389/fpsyg.2014.00756>
- Lehrer, P., Kaur, K., Sharma, A., Shah, K., Huseby, R., Bhavsar, J., & Zhang, Y. (2020). Heart rate variability biofeedback improves emotional and physical health and performance: A systematic review and meta analysis. *Applied Psychophysiology and Biofeedback*, *45*(3), 109–129. <https://doi.org/10.1007/s10484-020-09466-z>
- Levenson, R. W., Ekman, P., & Friesen, W. V. (1990). Voluntary facial action generates emotion-specific autonomic nervous system activity. *Psychophysiology*, *27*(4), 363–384. <https://doi.org/10.1111/j.1469-8986.1990.tb02330.x>
- Levenson, R. W. (1994). Human emotions: A functional view. In P. Ekman & R. Davidson (eds.), *The Nature of emotion: Fundamental questions* (pp. 123–126). Oxford University Press.
- Linley, P. A. (2006). Counseling psychology's positive psychological agenda: A model for integration and inspiration. *Counseling Psychologist*, *34*, 313–322.
<https://doi.org/10.1177/0011000005284393>

- Lopez, S. J., & Edwards, L. M. (2008). The interface of counseling psychology and positive psychology: Assessing and promoting strengths. *Handbook of counseling psychology*, 4, 86-102.
- Low, A., & McCraty, R. (2018). The effects of Hong Kong employees' workplace stress on heart rate variability. *Journal of Clinical Review and Case Reports* 3(3), 1–13.
- Lutz, B. (2014). An institutional case study: Emotion regulation with heartmath at santa cruz county children's mental health. *Global Advances in Health and Medicine*, 3(2), 68–71. <https://doi.org/10.7453/gahmj.2014.007>
- Luskin, F., Reitz, M., Newell, K., Quinn, T. G., & Haskell, W. (2002). A controlled pilot study of stress management training in elderly patients with congestive heart failure. *Preventive Cardiology*, 5(4), 168–172.
- Lyubomirsky, S., & Layous, K. (2013). How Do Simple Positive Activities Increase Well-Being?. *Current directions in psychological science*. 22. 57-62. [10.1177/0963721412469809](https://doi.org/10.1177/0963721412469809).
- Lyubomirsky, S., Sheldon, K., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, 9(2), 111–131. [doi:10.1037/1089-2680.9.2.111](https://doi.org/10.1037/1089-2680.9.2.111)
- Lyubomirsky, S. (2008). *The how of happiness: A scientific approach to getting the life you want*. Penguin.
- Malik M, & Camm, A. J. (1990). Heart rate variability. *Clinical Cardiology* 13(8):570-6. [doi:10.1002/clc.4960130811](https://doi.org/10.1002/clc.4960130811). PMID: 2204508.
- Maslow, A. H. (1968). *Towards a psychology of being* (2nd ed.). Princeton, NJ: Van Nostrand.
- McCarty, R. (2016). The fight-or-flight response. In G. Fink (Ed.), *Stress: Concepts, cognition, emotion, and behavior* (1st ed., pp. 33–37). Academic Press. <https://doi.org/10.1016/B978-0-12-800951-2.00004-2>
- McCraty, R. (Ed.). (2001). *Science of the heart: Exploring the role of the heart in the human performance*. Boulder Creek, CA: Institute of Heartmath.
- McCraty, R. (2002). Influence of cardiac afferent input on heart-brain synchronization and cognitive performance. In *International Journal of Psychophysiology* (Vol. 45, No. 1-2, pp. 72-73).
- McCraty, R. (2003). The scientific role of the heart in learning and performance. *HeartMath Research Center, Institute of HeartMath, Publication*, (02-030), 1-10.
- McCraty, R. (2004). The energetic heart: Bioelectromagnetic communication within and between people. *Bioelectromagnetic Medicine*. New York: Marcel Dekker, 541-62.
- McCraty, R. (2015). *Science of the heart (Volume 2): Exploring the role of the heart in human performance*. HeartMath Institute.
- McCraty, R., Atkinson, M., Tiller, W. A., Rein, G., & Watkins, A. D. (1995). The effects of emotions on short-term power spectrum analysis of heart rate variability. *American Journal of Cardiology* 76 (14), 1089–1093. DOI: [10.1016/S0002-9149\(99\)80309-9](https://doi.org/10.1016/S0002-9149(99)80309-9)

- McCraty, R., Atkinson, M., & Tomasino, D. (2003). Impact of a workplace stress reduction program on blood pressure and emotional health in hypertensive employees. *Journal of Alternative and Complementary Medicine*, 9 (3), 355–369.
- McCraty, R., Atkinson, M., Tomasino, D., & Bradley, R. J. (2009). The coherent heart: Heart-brain interactions, psychophysiological coherence and the emergence of system-wide order. *Integral Review*, 2, 10–115.
- McCraty, R., Barrios-Choplin, B., Rozman, D., Atkinson, M., & Watkins, A. D. (1998). The impact of a new emotional self-management on stress, emotions, heart rate variability, DHEA and cortisol. *Integrative Physiological and Behavioral Science*, 33(2), 151–170.
- McCraty, R., & Childre, D. (2004). The grateful heart: the psychophysiology of appreciation. In R. A. Emmons & M. E. McCullough (Eds.), *The psychology of gratitude*. (pp. 230–255). Oxford University Press.
- McCraty, R., & Childre, D. (2010). Coherence: bridging personal, social and global health. *Alternative Therapies in Health and Medicine*, 16, 10–24.
- McCraty, R., & Deyhle, A. (2015). The global coherence initiative: Investigating the dynamic relationship between people and earth's energetic systems. In P. J. Rosch (Ed.), *Bioelectromagnetic and Subtle Energy Medicine* (2nd Ed.). Routledge, Taylor & Francis. ISBN 9781482233193.
- McCraty, R., Atkinson, M., Tiller, W. A., Rein, G., & Watkins, A. D. (1995). The effects of emotions on short term heart rate variability using power spectrum analysis. *American Journal of Cardiology*, 76(14), 1089-1093.
- McCraty, R., & Tomasino, D. (2006a). Coherence-building techniques and heart rhythm coherence feedback: new tools for stress reduction, disease prevention and rehabilitation. In *Clinical psychology and heart disease* (pp. 487-509). Springer, Milano.
- McCraty, R., & Tomasino, D. (2006b). Emotional stress, positive emotions and psychophysiological coherence. In B. B. Arnetz, & R. Ekman (Eds.), *Stress in health and disease* (pp. 360–383). Wiley-VCH.
- McCraty, R., & Zayas, M. A. (2014a). Cardiac coherence, self-regulation, autonomic stability, and psychosocial well-being. *Frontiers in Psychology*, 5, 1090. <https://doi.org/10.3389/fpsyg.2014.01090>
- McCraty, R., & Zayas, M. (2014b). Intuitive intelligence, self-regulation, and lifting consciousness. *Global Advances in Health and Medicine*, 3(2), 56-65. <https://doi.org/10.7453/gahmj.2014.013>
- Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the Structure of Behavior*. Henry Holt & Co.
- Moher, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The prisma statement. *Annals of Internal Medicine*, 151(4), 264. <https://doi.org/10.7326/0003-4819-151-4-200908180-00135>
- Moussavi, K. E., & Birjandi, P. (2019). Heart-brain coherence: Relationship between high coherence ratio and reading anxiety among Iranian EFL learners. *Journal of Research in Applied Linguistics*, 10(1), 32–50.
- Mostafazadeh, P., Ebadi, Z., Mousavi, S., & Nouroozi, N. (2019). Effectiveness of school-based mindfulness training as a program to prevent stress, anxiety, and depression in high school students. *Health Education and Health Promotion*, 7(3), 111-117.

- Nesse, R.M. (1990). Evolutionary explanations of emotions. *Human Nature, 1*, 261–289. <https://doi.org/10.1007/BF02733N86>
- Novella, S. (2012). *Energy medicine – Noise-based pseudoscience*. Science-Based Medicine. <https://sciencebasedmedicine.org/energy-medicine-noise-based-pseudoscience/>
- Parks, A. C., & Biswas-Diener, R. (2013). Positive interventions: Past, present and future. *Mindfulness, acceptance, and positive psychology: The seven foundations of well-being*, pp140-165. New Harbinger Publications, Inc
- Peterson, C. (2006). *A primer in positive psychology*. Oxford University Press.
- Petrocchi, N., & Couyoumdjian, A. (2015). The impact of gratitude on depression and anxiety: the mediating role of criticizing, attacking, and reassuring the self, *Self and Identity*. <https://doi.org/10.1080/15298868.2015.1095794>
- Philips, B., & Wennberg, P. (2014). The Importance of therapy motivation for patients with substance use disorders. *Psychotherapy, 51*(4), 555–562. <https://doi.org/10.1037/a0033360>
- Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology, 74*, 116–143. <https://doi.org/10.1016/j.biopsycho.2006.06.009>
- Ramaekers, D., Ector, H., Demyttenaere, K., Rubens, A., & Van de Werf, F. (1998). Association between cardiac autonomic function and coping style in healthy subjects. *Pacing and Clinical Electrophysiology, 21*(8), 1546–52. <https://doi.org/10.1111/j.1540-8159.1998.tb00241.x>
- Ramel, W., Goldin, P., Carmona, P., & Mcquaid, J. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research 28*, 433–455. <https://doi.org/10.1023/B:COTR.0000045557.15923.96>
- Rashid, T., & Seligman, M. P. (2018). *Positive Psychotherapy: Clinician Manual*. Oxford University Press.
- Ratanasiripong, P., Ratanasiripong, N., & Kathalae, D. (2012). Biofeedback intervention for stress and anxiety among nursing students: A randomized controlled trial. *ISRN nursing, 2012*, 827972. <https://doi.org/10.5402/2012/827972>
- Reneau, M. (2019). Heart rate variability biofeedback to treat fibromyalgia: An integrative literature review. *Pain Management Nursing, 21*(3), 225–232. <https://doi.org/10.1016/j.pmn.2019.08.001>
- Retnowati, S., Ramadiyanti, D. W., Suciati, A. A., Sokang, Y. A., & Viola, H. (2015). Hope intervention against depression in the survivors of cold lava flood from Merapi mount. *Procedia-Social and Behavioral Sciences, 165*, 170-178.
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology, 21*(2), 95–103. <https://doi.org/10.1037/h0045357>
- Rowe, G., Hirsh, J. B., & Anderson, A. K. (2007). Positive affect increases the breadth of attentional selection. *Proceedings of the National Academy of Sciences of the United States of America, 104*(1), 383–388. <https://doi.org/10.1073/pnas.0605198104>
- Rozman, D., & McCraty, R., & Goelitz, J. (1998). *The Role of the Heart in Learning and Intelligence A Summary of Research and Applications with Children*.

- Salzberg, S. (1995). *Lovingkindness: The revolutionary art of happiness*. Shambhala. .
- Sapolsky, R. M. (2004). *Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping*. Holt paperbacks.
- Scheel, M.J., Davis, C.K., & Henderson, J.D. (2012). Therapist use of client strengths. *The Counseling Psychologist, 41*, 392 - 427.
- Schueller, S. M. (2010). Preferences for positive psychology exercises. *The Journal of Positive Psychology, 5*(3), 192-203.
- Schueller, S. M., & Parks, A. C. (2014). The science of self-help: Translating positive psychology research into increased individual happiness. *European Psychologist, 19*(2), 145–155. <https://doi.org/10.1027/1016-9040/a000181>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5–14. <https://doi.org/10.1037/0003-066X.55.1.5>
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 60*(5), 410–421. <https://doi.org/10.1037/0003-066X.60.5.410>
- Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *Journal of clinical psychology, 65*(5), 467–487. <https://doi.org/10.1002/jclp.20593>.
- Shaffer, F., McCraty, R., & Zerr, C. L. (2014). A healthy heart is not a metronome: an integrative review of the heart's anatomy and heart rate variability. *Frontiers in Psychology, 5*, 1040. <https://doi.org/10.3389/fpsyg.2014.01040>
- Shonin, E., Gordon, W. V., Compare, A., Zangeneh, M., & Griffiths, M. D. (2015). Buddhist-derived loving-kindness and compassion meditation for the treatment of psychopathology: A systematic review. *Mindfulness, 6*, 1161–1180.
- Shweder, R. A. (2012). The cultural psychology of natural kinds and the deconstruction of the emotions: A comment. *Emotion Review, 4*(4), 382–384. <https://doi.org/10.1177/1754073912445823>
- Steimer T. (2002). The biology of fear- and anxiety-related behaviors. *Dialogues in Clinical Neuroscience, 4*(3), 231–249. <https://doi.org/10.31887/DCNS.2002.4.3/tsteimer>
- Thayer, J. F., & Lane, R. D. (2009). Claude Bernard and the heart–brain connection: Further elaboration of a model of neurovisceral integration. *Neuroscience & Biobehavioral Reviews, 33*(2), 81-88.
- Tiller, W. A., McCraty, R., & Atkinson, M. (1996). Cardiac coherence: A new, non-invasive measure of autonomic nervous system order. *Alternative Therapies in Health and Medicine, 2*, 52–65.
- Trousselard, M., Canini, F., Claverie, D., Cungi, C., Putois, B., & Franck, N. (2016). Cardiac Coherence Training to Reduce Anxiety in Remitted Schizophrenia, a Pilot Study. *Applied Psychophysiology and Biofeedback, 41*, 61–69. <https://doi.org/10.1007/s10484-015-9312-y>
- Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356–367. <https://doi.org/10.1177/1534484305278283>

- Totzeck, C., Teismann, T., Hofmann, S. G., von Brachel, R., Pflug, V., Wannemüller, A., & Margraf, J. (2020). Loving-kindness meditation promotes mental health in university students. *Mindfulness*, *11*(7), 1623–1631. <https://doi.org/10.1007/s12671-020-01375-w>
- Valenza, G., Toschi, N., & Barbieri, R. (2016). Uncovering brain-heart information through advanced signal and image processing. *Philosophical Transactions of the Royal Society, Series A*, *374*(2067). <https://doi.org/10.1098/rsta.2016.0020>
- Vaschillo, E. G., Vaschillo, B., Pandina, R. J., & Bates, M. E. (2011). Resonances in the cardiovascular system caused by rhythmical muscle tension: Rhythmical muscle tension and resonance. *Psychophysiology*, *48*(7), 927–936. <https://doi.org/10.1111/j.1469-8986.2010.01156.x>
- Wallace, B. A., & Shapiro, S. L. (2006). Mental balance and well-being: Building bridges between Buddhism and Western psychology. *American Psychologist*, *61*(7), 690–701. <https://doi.org/10.1037/0003-066X.61.7.690>
- Webster, Jane & Watson, Richard. (2002). Analyzing the past to prepare for the future: Writing a Literature Review. *MIS Quarterly*. 26. <https://doi.org/10.2307/4132319>.
- Weibel, D. T., McClintock, A. S., & Anderson, T. (2017). Does loving-kindness meditation reduce anxiety? Results from a randomized controlled trial. *Mindfulness*, *8*(3), 565–571. <https://doi.org/10.1007/s12671-016-0630-9>
- Werner-Seidler, A., Banks, R., Dunn, B. D., & Moulds, M. L. (2013). An investigation of the relationship between positive affect regulation and depression. *Behaviour Research and Therapy*, *51*(1), 46–56.
- Willig, C. (2001). *Introducing qualitative research in psychology: Adventures in theory and method*. Open University Press.
- Wood, A. M., & Tarriner, N. (2010). Positive clinical psychology: A new vision and strategy for integrated research and practice. *Clinical Psychology Review*, *30*(7), 819–829. <https://doi.org/10.1016/j.cpr.2010.06.003>
- Wood, A. M., Froh, J. J., & Geraghty, A. W. (2010). Gratitude and well-being: a review and theoretical integration. *Clinical psychology review*, *30*(7), 890–905. <https://doi.org/10.1016/j.cpr.2010.03.005>
- Zeng, X., Chiu, C. P., Wang, R., Oei, T. P., & Leung, F. Y. (2015). The effect of loving-kindness meditation on positive emotions: a meta-analytic review. *Frontiers in psychology*, *6*, 1693. <https://doi.org/10.3389/fpsyg.2015.01693>

Appendix 1

PPI research studies: Cross-culturally

Sourced from Rashid & Seligman, 2018, p. 10–13.

Source	Clinical Focus and Relevant PPT	Description (sample, Methodology used)	Findings
Cheavens et al., 2006.	Depression Character strengths	Thirty-four adults meeting criteria for Major Depressive Disorder.	Results: Showed that the clients in a group that focused their strengths showed a faster rate of symptom change compared to the deflector compensation approach.
Flickiger et al., 2008.	Anxiety Client's own resources, such as individual strength, abilities and readiness, are incorporated in the treatment.	This study, conducted in Germany, explored whether focusing on clients' resources (competencies) in the initial stage of therapy, had an impact on treatment effectiveness.	Results: Showed that focusing on the clients' personal competencies was associated with a positive treatment outcome ; this was irrespective of pre-treatment distress, the rapid response of well-being and symptom reduction, the therapist's professional experience and the treatment duration.
Ho et al., 2014.	Depression Story of happiness; noticing gratitude in everyday life; identifying optimistic thinking; savouring; curiosity.	Seventy-four participants from the community and nursing homes in Hong Kong, aged 63–105 years, completed a 9-week group setting of PPI.	Results: Showed a reduction in depression symptoms and increased levels of vitality, satisfaction, gratitude and happiness.
Huffman et al., 2014.	Suicidality Gratitude visit; Character strengths; Best possible self; Counting blessings; Meaningful activities.	The study assessed the feasibility and acceptability of nine PP interventions delivered to patients who were hospitalised for suicidal thoughts or behaviours. Secondly, it explored the relative impact of the interventions.	Results: Showed the overall effects of PP interventions; both gratitude and personal strengths showed the most effectiveness. The study took into account order, age and skipped exercises.

<p>Ko & Hyun, 2015.</p>	<p>Depression Writing about good things; positive feedback; letter of gratitude.</p>	<p>Fifty-three adults diagnosed with Major Depressive Disorder received 8-week PPI; control group no treatment at all; in a hospital setting in Korea.</p>	<p>Results: A group receiving PPI reported a significant decline in depressive scores and significant increases on measures of hope and self-esteem – compared to the control group.</p>
<p>Lambert D’raven et al., 2015.</p>	<p>Depression Writing graduate letters; engaging in good deeds.</p>	<p>Six-week pilot program; 76 patients in a primary health setting with symptoms of depression participated in an intervention that consisted of engaging in good deeds and writing gratitude letters.</p>	<p>Results: Showed scores improve from the baseline to six months after follow on, for health, vitality, mental health and daily physical activities.</p>
<p>Retnowati et al., 2015</p>	<p>Depression after a natural disaster Hope intervention; goal identification; planning; keeping the motivation.</p>	<p>Intervention group of 31 adults affected directly by eruptions of Mount Merapi in Indonesia; received four, 2-hour sessions on hope intervention. They were compared to the control group untreated.</p>	<p>Results: The intervention group showed a significant decrease in depression following the treatment.</p>
<p>Chaves et al., 2017.</p>	<p>Depression Gratitude; savouring; character strengths; kindness.</p>	<p>A randomised and controlled trial, followed by structured diagnosis of clients with Major Depressive Disorder who were assigned to a group, either Cognitive Behavioural Therapy (n=49) or PPI (N=47).</p>	<p>Results: Clients in both groups showed significant pre-to-post intervention changes to all major outcomes but no significant differences were found between the two interventions.</p>
<p>Sin & Lyubomirsky 2009.</p>	<p>Depression symptoms A meta-analysis including 51 PPIs with 4,266 individuals, exploring their effectiveness and providing practical guidance to clinicians.</p>	<p>Includes 51 PPIs with n=4,266 individuals. Examining PPI effectiveness. In addition, the study aimed to provide further guidance to clinicians on how PPIs can be used in practice.</p>	<p>Results: Indicated that PP interventions significantly enhanced well-being and decreased depressive symptoms.</p>

Lambert & Pasha-Zaidi, 2014.	Counselling practitioners review Explores a sampling of PPIs such as gratitude, savouring, and self-compassion	A review to describe why, how and under what conditions these PPIs are effective and who will benefit optimally.	Results: The review concluded that PPIs can contribute to greater well-being but considerations should be sought – considering fit, timing, culture and the number of interventions used – more isn't always better.
---	--	--	--

Sourced from Rashid & Seligman, 2018, p. 10–13.

Appendix 2

The Formation of the Proposed HLC Programme

Aim: The aim is to suggest a plan to inform the basis of a credible programme (the HLC Programme) that will be ready for testing and measurement stages. The Programme structure is supported by the present study's comprehensive literature research. The Programme follows two key mechanisms:

Primary Mechanism: A structured programme that uses heart-brain coherence interventions and Positive Psychology Interventions to improve coherence within the body and mind.

Secondary Mechanism: The primary mechanism's effect is suggested to be the reduction of anxiety symptoms in patients.

The Heart-Led Counselling Programme combines both heart-brain interventions and Positive Psychology Interventions in such a way that they complement each other and amplify the effects in terms of reduction in anxiety symptoms. This Programme will take place in a therapeutic setting and use a person-centred counselling approach.

1. HLC Programme Formation

Programme Formation Disadvantages

Since the Programme is built on the findings from an integrative literature review of research in the chosen fields, this may lack researcher transparency or may not integrate literature strongly enough to provide a credible foundation. Confirmation bias may have influenced the Programme formation, as may enthusiasm for its effectiveness. It is possible that the Programme, once tested and measured for its effectiveness, may be unsuccessful. Specifically, the lack of effectiveness may be due to the counselling environment, or the Programme's structure. This may be because the Programme requires a mindful therapeutic approach during delivery and moves away from modern, assessment-based counselling and therapeutic practices. Some patients may become demotivated about participation outside therapy, or lack a connection to the Programme's holistic theme.

Programme Formation Advantages

This Programme involves autonomy and independence on the part of patients, who play an active part in the interventions and may feel empowered by this notion; essentially, they will take responsibility for their own recovery. The consistent theme of reducing the symptoms of anxiety provides focus to the Programme; it is a structured programme aiming to reduce anxiety. It may be that the Programme will additionally contribute to stress regulation and mental clarity. The Programme's structure is relatively flexible and could be delivered in various contexts, such as group settings or educational settings in schools.

2. Suggested Programme Progression Measures

Measurement of improvement: Using Baseline Anxiety Test

To measure the Programme's effectiveness, the researcher anticipates using an inventory for measuring clinical anxiety, such as Beck Anxiety Inventory (BAI). The anxiety measure will help provide the Programme with a baseline score of anxiety beforehand, a continual measure throughout and a post-programme score after completion. This will help to ascertain the extent of reduction in symptoms, if any takes place. The measure component will be implemented at a later stage of development to test the Programme's hypothesis. It is also important to note that participants should not be taking any medication for anxiety prior to, or during, involvement in the Programme. This will ensure that the measures of participants' clinical anxiety will be credible and it will also avoid inaccurate measurements being recorded. This requirement will be added into the pre-Programme criteria (Table 7) thus ensuring a valid measure of improvement that is based on the Programme's effect alone as much as possible.

3. Programme Considerations, Advantages and Disadvantages

Confirmation bias

As the Programme combines mindful approaches, it is essential to acknowledge and avoid any confirmation bias towards the nature of mindfulness and its effects on anxiety. The Programme is anchored within a universalist stance that the practice of mindfulness is an innate human cognitive ability, and therefore will be beneficial to all. Farias and Wikholm (2016) believe that because of this universalist stance, scientists may turn a blind eye to the fact that individuals react differently to mindful techniques – not everyone will have a positive experience, nor achieve the same results. Thus, there is a need to acknowledge that individuals will vary in their dispositional levels of mindfulness; some individuals will find mindful-based

interventions easier to connect with than others (Baer et al., 2006). This means that the HLC Programme may appeal more to specific individuals who are open to mindfulness and to heart-based interventions. However, it has to be noted that by implementing these interventions into a counselling context, this allows for detection of such matters. Nevertheless, it is deemed essential to assert pre-programme conditions to improve the likelihood of the Programme's effectiveness for the individuals taking part (Table 7).

Reliant on independent participation

The Programme involves four phases of delivery and requires participants to persevere through all phases. Independent practice, outside of therapy sessions, is also required from participants. It is important to note that not every participant will have the motivation to become self-directed outside of therapy; this may contribute to withdrawal from the Programme or to a participant's lack of consistent improvement. In their study on motivation, Philips and Wennberg (2014) found that patients tended to have predictable retention of psychotherapy relationships based on their individual characteristics and the therapy content being delivered (see also Fredrickson, 2009). In addition, PPIs work best when individuals are persistent and feel that the activity best suits their personalities (Lyubomirsky & Layous, 2013; Schueller, 2010). This makes it essential to note that individual progress may be dependent on Programme suitability, as well as on personal predispositions; this makes the application of pre-programme criteria even more important.

Although the nature of delivery suggests a non-directive approach, it does sit within a programme structure. Certain stages (e.g., autonomous therapy interventions) need to be undertaken sequentially to allow independent experiences to form. In addition, for the Programme to be effective, participants are required to have a level of commitment and responsibility towards their recovery, and to immerse themselves in participating actively in the Programme's interventions.

Managing expectations

As the Programme will be delivered within a counselling context, specific barriers may be acknowledged. Firstly, it is essential to account for the participants' expectations. This Programme is structured by interventions and follows a mapped, 12-week plan; this moves away from an open approach to counselling. Participants may be inclined, during the talking

therapy times, to discuss other topics that distress them and, although it is deemed necessary not to dismiss participants’ additional issues, it is essential to keep focused on the Programme boundaries. This will make professional judgment a factor when navigating through the Programme (Lazarus, 1994). Furthermore, it is crucial to communicate that the Programme does not guarantee the same therapeutic scope as counselling sessions alone. Clear communication from the outset will help to manage the participants’ expectations in terms of the Programme’s purpose (see Table 7).

Table 7:

Criteria for entering into the HLC Programme.

	Criteria	Measure
1	A pre-programme anxiety test: Participants must evidence moderate anxiety score, pre-programme.	<i>Measure:</i> Pre-programme baseline anxiety test is taken, and a score of 22–35 = moderate anxiety is recorded
2	Predisposition: Participants must have positive attitudes towards mindfulness and its value to their well-being; should also have an interest or a hobby that connects with them. They should be open to trying the approach.	<i>Measure:</i> Assess through a questionnaire.
3	Medication: Is currently not taking any medication for anxiety issues; no such medication before or during the Programme.	<i>Measure:</i> Assess through a questionnaire.
4	Role & responsibility: Participant is in a ready space, fully understands and expects the Programme structure, and understands the operational requirements for the interventions suggested through the Programme.	<i>Measure:</i> Assess through a questionnaire. The participant is given an outline of the Programme structure that describes both the counsellor’s and the participant’s roles, and their responsibilities while involved in the Programme (to include details of the active interventions that need to be undertaken outside therapy).

Appendix 3

The Proposed 12-Week Heart-Led Counselling (HLC) Programme: A Scalable Intervention Proposal

The HLC Programme makes use of a combination of evidence-based interventions informed by a comprehensive literature review. It is anticipated that it will be effective in anxiety reduction. The Programme combines proven PP strategies (gratitude and LKM) as a primary function to induce positive emotional states, and thereby connect to the heart's inner wisdom and coherence. Additionally, the Programme aims to help empower individuals suffering from anxiety and evoke in them a new sense of coping. The heart-led interventions also help build trust, inner knowing, and an instinctual guidance system, all of which contribute towards connection with the whole of the heart's potential and with activation of the PNS.

Heart-led Counselling

This Programme will address the following outcomes that have been established as reasonable in the research literature explored and analysed in this study:

1. Decreases moderate anxiety symptoms in patients;
2. Builds heart and brain coherence within the individual;
3. Pre-trains overall mental clarity and cognitive processing;
4. Improves inner connection with heart intuition and wisdom to ease stress and anxiety triggers;
5. Builds a positive perspective of the connective relationship to holistic embodiment;
6. Helps patients learn to feel positive emotions within the heart space and then to pause and listen to the intuitive guidance given.

Furthermore, to strengthen the Programme's relevance, a structure of four presentation phases is proposed for further advancement. The phases are as follows:

HLC – The Four Programme Presentation Phases

Before the commencement of the Programme's four phases, the following components need to be completed and recorded to ensure suitability of participants and management of their expectations. In addition, this step ensures that participants understand and accept the pre-programme criteria (see Appendix 2, Table 7).

- *Pre-criteria checklist completed and matched for suitability;*
- *Pre- baseline test be to taken, and scores noted.*

Phase one: Introduction of core elements

1. **Introduction:** Initially, prospective HLC Programme participants will be introduced to the outlines of all five interventions and how they will be of benefit. The roles and responsibilities of both the counsellor and participants will be clarified. Participants will be assured of confidentiality of the information and of their right to free will.
2. **Gratitude Journaling:** Participants are encouraged to start the ongoing practice of cultivating gratitude through journaling and identifying three good things, big or small, to reflect on in order to build a habit of appreciation each day.

Delivery mode: via face-to-face sessions, using a range of delivery methods best suited to the individual; e.g., visual aids, open verbal conversation and written booklet content. Presentation will use a person-centred approach, open stance and exploration.

Phase two: Building the foundation for positive emotions

1. **Loving Kindness Meditation (LKM):** An introduction to LKM, its purpose and practice experiences within the session, with the counsellor present. Two consecutive sessions focus on external positive communication and appreciation of others and self.
2. **Gratitude Expressions:** Two consecutive sessions, building on gratitude journaling, using in-session gratitude letters, and gratitude expressive savouring from past and current experiences; gratitude is expressed to individuals, but also to the self.

Measure: anxiety symptoms are discussed within the session, and a reflection of changes occurs at the start of the session.

Delivery mode: via face-to-face sessions, using a range of delivery methods best suited to the individual; e.g., visual aids, open verbal conversation, written work or visualisation. Delivery uses a person-centred approach, open stance and exploration.

Phase three: Building on heart-brain coherence

1. **Introduction of three HeartMath Interventions:** three consecutive sessions during which the three interventions (*The Quick Coherence*[®], *The Freeze-frame Technique*, and *Inner-Ease*[™] *Technique*) will be introduced and practised with the counsellor present. This phase also involves the practice of these new techniques outside of therapy. The participant will keep an active, reflective diary of these intervention practices outside of the sessions, for open discussion where appropriate in this phase.

Measure: anxiety symptoms are discussed within-session, and a reflection of changes occurs at the start of the session.

Delivery mode: via face-to-face sessions and outside participation exercises. A range of delivery modes will be used, focussing on the three heart-brain interventions, such as meditation practices, open heart questioning, and heart focusing.

Phase four: Building on the heart's presence (intelligence and wisdom)

This phase will offer an understanding of heart intelligence and its benefits for aiding the recovery of anxiety sufferers. The need for positive emotional states and how they benefit synchronisation of the physiological state will also be discussed. All are focused towards the heart's "feeling centre", meaning key focus will be placed on the emotions being felt in the heart and further building upon the use of positive emotions, such as appreciation, love and joy.

1. **Heart Questioning Techniques:** one session, connecting with the hearts' ability to provide solutions to the participant's current issues, or ruminating situations. This is completed using an empty chair technique and the Freeze-Frame intervention.
2. **Expressive Reflection:** One session, exploring expressive reflection by the participant, openly and honestly. The counsellor will open a suggestion for the participant to

produce a heart-led, self-development reflection display which could be verbal, written, or in the form of media or art. This is to express the connection found towards positive emotions and, therefore, to heart wisdom. This also encourages autonomous reflections on which interventions used in the Programme helped the most in reducing anxiety symptoms.

Measure: anxiety symptoms are discussed within the session, and a reflection of changes occurs at the start of the session.

Delivery mode: via face-to-face sessions, using a range of delivery methods best suited to the individual; e.g., visual aids, open verbal conversation, written work or visualisation. Overall, presentation is with a person-centred approach, open stance and exploration.

Overview of Expected Outcomes for The Intuitive Heart-Led Counselling Programme

Expected outcomes for this Programme may be stated as follows:

- To use the HLC Programme as a stand-alone programme to help patients reduce anxiety symptoms utilizing a combination of heart-led interventions.
- It is hoped that this Programme will help patients reach the “shifting point” from desynchronisation to synchronisation (coherence), and therefore lead to a reduction in moderate anxiety.
- To contribute to the understanding of how combining PPIs and heart-led interventions, in modern counselling practices, can be most effective.