



**Interoceptive Awareness and Emotion Regulation through a
Theatre-Based Relational Health Intervention:
A Heart Rate Variability Study**

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Declaration

I, Ruth Levin, present this thesis in fulfilment of the requirements for the degree of Doctor of Philosophy in the Department of Psychiatry and Mental Health, Faculty of Health Sciences, University of Cape Town (UCT). I hereby declare that this thesis is my own work, and neither the whole work nor any part of it has been, is being, or will be submitted for another degree in this or any other university. This thesis has been submitted to the Turnitin module, and I confirm that my supervisors have seen the report and there were no plagiarism concerns.

The study protocol was approved by UCT's Faculty of Health Sciences Human Research Ethics Committee (HREC 771/2019) and (HREC 068/2019) and all participants provided written informed consent.

Date: 4th December 2024

Dedication

For Christiaan – you are the earth to my sky.

For Ruben – you are the centre of my heart.

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Abbreviations

ACC	<i>anterior cingulate cortex</i>
ACT	<i>acceptance and commitment therapy</i>
AIC	<i>anterior insula cortex</i>
ANS	<i>autonomic nervous system</i>
ANOVA	<i>analysis of variance</i>
BMI	<i>body mass index</i>
CAN	<i>central autonomic network</i>
CBT	<i>cognitive behavioural therapy</i>
CNS	<i>central autonomic system</i>
DBT	<i>dialectical behaviour therapy</i>
DSB	<i>deep and slow breathing</i>
ECG	<i>electrocardiography</i>
EEG	<i>electroencephalography</i>
ER	<i>emotion regulation</i>
FFMQ	<i>five-facet mindfulness questionnaire</i>
fMRI	<i>functional magnetic resonance imaging</i>
GNLBE	<i>Golden Nugget Listening Breathing Exercise</i>
HF	<i>high frequency</i>
HFP	<i>high frequency power</i>
HR	<i>heart rate</i>
HRV	<i>heart rate variability</i>
IBI	<i>inter-beat intervals</i>
IAw	<i>interoceptive awareness</i>
IQR	<i>interquartile range</i>
LF	<i>low frequency</i>
LFP	<i>low frequency power</i>
lnHFP	<i>natural log transformed high frequency power</i>
lnLFP	<i>natural log transformed low frequency power</i>
LKM	<i>loving kindness mediation</i>
lnTP	<i>natural log transformed total frequency power</i>
MAIA-2	<i>multidimensional assessment of interoceptive awareness-version 2</i>
MBIs	<i>mindfulness-based interventions</i>

MBCT	<i>mindfulness-based cognitive therapy</i>
MBSR	<i>mindfulness-based stress reduction</i>
MBRP	<i>mindfulness-based relapse prevention</i>
M	<i>mean</i>
Med	<i>median</i>
NN	<i>normal to normal</i>
OFC	<i>orbito-frontal cortex</i>
PCL-5	<i>PTSD checklist for DSM-5</i>
PFC	<i>prefrontal cortex</i>
PNS	<i>parasympathetic nervous system</i>
PTSD	<i>post-traumatic stress disorder</i>
SD	<i>standard deviation</i>
SNS	<i>sympathetic nervous system</i>
TOM	<i>theory of mind</i>
TP	<i>total power</i>
RCT	<i>randomised controlled trial</i>
RF	<i>respiratory frequency</i>
RH	<i>relational health</i>
rmANOVA	<i>repeated measures ANOVA</i>
rCBF	<i>regional cerebral blood flow</i>
RMSSD	<i>root mean square of successive difference</i>
rtAIC	<i>right anterior insula cortex</i>
SADAG	<i>South African Depression and Anxiety Group</i>
SCS	<i>self-compassion scale</i>
SDNN	<i>standard deviation of normal to normal</i>
SPSS	<i>statistical package for the social sciences</i>
STAI	<i>Spielberger state-trait anxiety inventory</i>
TBRH	<i>Theatre-Based Relational Information Health</i>
UCT	<i>University of Cape Town</i>
vmPFC	<i>ventromedial prefrontal cortex</i>

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ABSTRACT

Relational health is considered a key indicator of mental health and requires interoceptive awareness and emotion regulation. The ability to attune to and regulate one's thoughts and emotions for well-being is the precursor to healthy relationships that are empathic, compassionate, and authentic. Within the field of contemplative science, mindfulness-based interventions enhance relational health by targeting self-awareness of entrenched reactivity and behaviour and the regulation thereof to improve relational health. Similarly, theatre pedagogy, an embodied and relational training, targets mindfulness of the relationship between one's internal milieu and external behaviour.

The aim of this study was to test whether a new intervention, the Theatre-Based Relational Health intervention, over six weeks, effects changes pre to post intervention in interoceptive awareness and emotion regulation in stressful relationships to improve relational health. This study hypothesised that entraining interoceptive awareness with an emotion regulation exercise, the Golden Nugget Listening Breathing Exercise, in the context of stressful relationships, will improve relational health.

Two studies were conducted. A pilot study assessed the feasibility and acceptability of the intervention and measured the preliminary effectiveness using behavioural questionnaires and qualitative interviews. A main study followed using an additional neurobiological measure, heart rate variability, in a waitlist-control design. A third group engaged as a retest group, received the breathing-only intervention.

Heart rate variability measures with questionnaires were used to determine associations that index interoceptive awareness in the brain-heart nexus. Heart rate variability measures were used to index cardiac autonomic outflow during emotion regulation. The Multidimensional Assessment of Interoceptive Awareness Scale and the Five Facet Mindfulness Scale were used to index interoceptive awareness, and in conjunction with the Self-Compassion Scale, were used to measure emotion regulation. Qualitative interviews were conducted post-intervention to explore how participants experienced the Theatre-Based Relational Health intervention and changes pre to post in their relational health.

Novel results were found with associations between increased heart rate variability measures and improvements in subscales 'Not-Worrying' and 'Trusting' of the Multidimensional Assessment of Interoceptive Awareness Questionnaire and improvements in the subscales 'Observe' and 'Acting with Awareness' of the Five Facet Mindfulness Scale. Corroborative results verified associations between increases in heart rate variability and

improvement in the subscale ‘Over-Identification’ and the ‘Total Score’ of the Self-Compassion Scale. Behavioural results showed significant increases in interoceptive awareness through the regulation subscales of the Multidimensional Assessment of Interoceptive Awareness and the Five Facet Mindfulness Scale, and emotion regulation through increases in the combination of all three scales. In the qualitative interviews, participants shared their experiences of substantial improvements in their relational health post-intervention. They described developing self-awareness amidst triggers, self-acceptance, self-care, and managing conflict using the Golden Nugget Listening Breathing Exercise and cited the group as a support system. The results in this study suggest that adapted character development exercises from theatre pedagogy might serve as a socio-cognitive and somatosensory tool for the development of interoceptive awareness. Overall, the intervention showed promise in improving relational health, and the Golden Nugget Listening Breathing Exercise may develop emotion regulation in the context of stressful relationships.

Chapter 1

INTRODUCTION

1.1 Overview

This PhD study introduces a new behavioural intervention, the Theatre-Based Relational Health (TBRH) intervention to improve relational health (RH). It is interdisciplinary in content, combining theatre pedagogy with social neuroscience. The TBRH intervention expands the field of contemplative science research through the inclusion of theatre pedagogy as a form of socio-cognitive and somatosensory training. Conceptually, the TBRH intervention combines the seemingly disparate fields of art and science into a cohesive program for individual growth in self-awareness of emotional triggers within stressful relationships. The intervention aims to enable increased authenticity, regulated communication, and more connectivity, which in turn improves RH. RH is considered a key component of mental health (Farb & Mehling, 2016; Porges & Furman, 2011; Siegel, 2010, 2012).

This chapter provides the background to the aims of this study. First, it introduces the purpose of the TBRH intervention and the hypothesis of this study. The chapter introduces the complexity of relationships through the lens of the neurobiology of relationships. Theatre pedagogy and its potential for developing Interoceptive Awareness (IAw) are discussed, and mindfulness-based interventions (MBIs), in which the TBRH intervention is situated, are introduced. Heart rate variability (HRV) – the main assessment method of this study – is briefly presented. The chapter further introduces the key terms and definitions used within this study. The chapter progresses to give an overview of the rationale behind the study, and the three research questions that informed the study are outlined within the study's aims and objectives. Finally, this chapter provides an outline of each chapter within this dissertation.

The aim of this study was to test whether a TBRH intervention develops IAw and emotion regulation (ER) to improve RH. Two studies were conducted. A pilot study assessed the feasibility and acceptability of the intervention and measured the preliminary effectiveness. A main study incorporated a neurobiological measure, heart rate variability, in a waitlist-control design, with an additional retest group who received the breathing-only intervention.

The TBRH intervention is a behavioural intervention that targets the neurophysiological mechanisms that underlie presence. Presence, the ability to stay attuned to present moment experience and not deviate into future or past thinking, is an essential tool within acting training to prepare the actor to remain connected and responsive to how external environmental cues activate the character's inner life and thus their behaviour (Brook, 1988, 1996, 2017; Marowitz, 1986; Moffitt, 1999; Rodenburg, 2009). This study hypothesises that entraining IAw with an ER tool, the Golden Nugget Listening Breathing Exercise (GNLBE), will improve RH. The GNLBE promotes compassionate listening to both the self and the other, specifically in the context of challenging relationship dynamics, which is the underlying mechanism aimed at improving RH.

The TBRH intervention is situated within theatre pedagogy. Theatre pedagogy is a knowledge system grounded in embodiment and relationality and understanding the self and others for the development of three-dimensional characters (Moore, 1984; Newlove, 1993; Stanislavski, 2013a, 2013b). Embodiment refers to the brain-body-environment responding as an integrated system (Varela, 2001; Khoury et al., 2017; Pasquinelli, 2006). Within this context, the TBRH intervention aims to equip individuals with tools to improve their relationships and stay regulated in stressful conversations so that they can move through difficult conversations in a healthier manner. To enable these better relationships, the TBRH intervention targets participants' understanding of their neurobiology and what has informed their perspective, i.e., the early family, religion, the socio-political, economic, and sensory environment in which they grew up, and how these elements have impacted their meaning-making within situations – a concept known as predictive encoding (Seth, 2013; Seth & Friston, 2016). Additionally, participants are trained to regulate their physiology, emotions, and thoughts when they become triggered during stressful encounters. The term 'triggers,' in the context of this study, denotes strong negative emotions that overwhelm the individual and inhibit their ability to regulate themselves (Davidson et al., 2000; Shapiro et al., 2008). Self-compassion, compassion for others, empathy, and increased tolerance are targeted through the progression of exercises within the TBRH intervention. Finally, the overarching goal of the TBRH intervention is to create increased connection and cohesion within families, work colleagues, communities, and societies at large. This study aims to contribute to the field of contemplative research with a new intervention and to extend the field by including theatre pedagogy as a mechanism to develop IAw.

1.2 The neurobiological complexity of relationships

Relationships are challenging for everyone. Whether with one's parents, children, partners, or work colleagues, we all struggle with relationships in different moments of our lifespan. Considering the neurobiological processes that inform our relational perceptions can help us understand why relationships can be challenging. Perspectives and outlooks derived from the stories we are born into are woven through our lived experience and subsequently become wired into our autonomic nervous system (ANS) reactivity (Damasio & Carvalho, 2013; Seth, 2013; Seth & Friston, 2016). These experiences are embedded in our social and cultural norms, familial patterns, and religious- and political environments. They form the perspective through which we engage with and understand our relationships (Damasio & Carvalho, 2013; Damasio, 1996). These frames are, for the most part, unconscious to us and each other. When we encounter a relationship issue, it is often a matter of different meaning-making that has been wired into our neurobiology, leading to the misinterpretation of each other.

To understand the complexity wired into our brain-body system, it is important to understand the process of homeostasis and its relationship to the development of the ANS. Homeostasis refers to the balance maintained within the different systems of the body to promote an optimum and efficiently functioning ANS (Craig, 2010; Craig & Craig, 2009; Damasio, 2003; Damasio & Carvalho, 2013). Our ability to form social connections and build healthy relationships forms an important part of our homeostatic regulation (Craig, 2003, 2004, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013). Social bonding in infancy is connected to the development of the healthy regulation of the ANS (Porges, 2009; Porges & Furman, 2011), where maladaptive attachment leads to the stress response becoming the habitual mode of adaptation (Porges, 2003; Porges, 2007). As we develop into adults, this autonomic and unconscious patterning dominates our reactivity within relationships (Porges, 2007; Porges & Furman, 2011). Relationships form a key messaging system for homeostasis (Porges, 2003; Porges, 2007, 2009). To understand this impact, it is necessary to look at the development of the ANS. As our social relationships became more complex, our nervous system adapted to accommodate this complexity. Where in times past, our nervous system presumably needed to respond more to threats via immobilisation, fight or flight, it now plays a big role in detecting threats and safety cues within relationships. The higher regions of the brain are continuously scanning the environment for signals of threat and safety, prompting the ANS accordingly. This is a process that Porges (2009) has termed 'neuroception' and

occurs unconsciously. Infants learn to regulate for the first six months through ingestive feeding via the breast or the bottle. From six months onwards, the infant-caregiver dyad replaces ingestive feeding for regulation (Porges & Furman, 2011). Infants learn to regulate themselves from their caregivers' facial gestures, vocal tone, eye gaze, and body orientation (Porges, 2003; Porges & Furman, 2011). Engagement between infants and their caregivers ranges from responsive to non-responsive and everything in between. Even on the healthy continuum, there will be caregivers who are overwhelmed, tired, or overworked or find looking after an infant beyond their capacity, and consequently, they are not attuned to their infant's signals (Siegel, 2010, 2012). When the infant does not receive an attuned response from their caregiver, they learn to regulate themselves using the excitatory sympathetic part of the nervous system, which houses the fight or flight stress response (Porges, 2003; Porges, 2009; Porges & Furman, 2011). In contrast, if the infant's cues are attuned to by their caregiver and responded to appropriately, through the caregiver being present to the infant through facial gesture, eye gaze and vocal tone, the newborn will learn to regulate themselves through the calming part of the PNS that is responsible for self-soothing and social bonding (Porges & Furman, 2011). These safety and threat cues are wired into our ANS in our early years through attachment to our early caregivers and subsequently through the social experiences we have in early childhood (Porges, 2003).

These significant positive and negative experiences are encoded into an area of the brain known as the ventromedial prefrontal cortex (vmPFC), which results in rapid retrieval when similar situations present themselves and will work with the anterior insula cortex (AIC) and anterior cingulate cortex (ACC) to motivate behaviour for further social adaptation (Damasio, 2003; Damasio & Carvalho, 2013). It becomes even more complex when one looks at the neurophysiological pathway of a feeling as it is received from a stimulus in the external environment and travels up the body-brain system, adjusting at each level for homeostasis (Craig, 2004). An external stimulus is received by the internal systems of the body, which includes the viscera, blood flow, tissues, fluid balance, oxygen, carbon dioxide, and the musculoskeletal system. All these processes of the body send messages via two routes, somatosensory and autonomic trajectories, into the brain to motivate adaptive behaviour for optimum social flourishing (Craig, 2003, 2004; Craig & Craig, 2009). This sensory input, in response to external environmental cues, travels through the spine or via the vagus nerve into the brainstem regions, then into the thalamus, and then on to relevant cortical brain regions (Craig, 2004; Craig & Craig, 2009). At each level, the information is

integrated and interpreted before it moves through to the next level (Craig, 2003, 2004). Multiple layers of interpretation occur in these neurophysiological pathways to activate behaviour regulation and adaptation for future social scenarios (Craig, 2010; Damasio & Carvalho, 2013; Gu et al., 2013). Each level of interpretation results in adaptation for homeostasis via the ANS, which will affect RH (Craig, 2003, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013; Gu et al., 2013). Our brains become predictive encoding machines based on our early environment encryptions (Seth, 2013), yielding some insight into the complexity behind relationships.

RH requires IAw and ER and combines intrapersonal attunement with interpersonal connection (Siegel, 2010, 2012, 2016). It attests to the relationship with one's internal world and whether one can attune to (i.e., IAw) and regulate (i.e., ER) one's mind and emotions for homeostasis and well-being (Craig, 2003, 2004, 2010; Craig & Craig, 2009; Damasio, 2003; Damasio et al., 2000; Goleman & Davidson, 2017). Additionally, it confirms one's ability to form a healthy relationship with another that is empathic and resonant, compassionate and caring, authentic, candid, and open (Davidson & McEwen, 2012; Neff, 2003; Neff & Germer, 2013; Siegel, 2010, 2012, 2016). A relationship with oneself and another requires flexibility and adaptability to remain in balance within changing social environments (Atkinson, 2013; Craig, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013; Goleman & Davidson, 2017; Lane et al., 2009).

In the context of the complexity of relationships exists a need for accessible interventions that address misunderstandings between people. It becomes imperative to have interventions that develop self-awareness of one's perspective, as well as enable the understanding of the relational environment from which one emerges. Moreover, one's perspective affects how situational, and relationship information is received, and the consequent manner of engagement is impacted by this within the different contexts that one inhabits (Seth, 2013; Seth & Friston, 2016). The TBRH intervention was designed specifically to address these relationship challenges and complexities. The TBRH intervention was developed to promote IAw of emotional triggers in stressful relationships with significant others and to entrain ER to manage one's emotions with compassion, to improve RH.

1.3 MBIs and the TBRH intervention

The TBRH intervention situates itself within MBIs as part of the third wave of novel interventions that emerge from Mindfulness-Based Stress Reduction (MBSR), Mindfulness-Based Cognitive Therapy (MBCT), Dialectical Therapy (DBT), Acceptance and Commitment Therapy (ACT), and compassion-based therapy, amongst others (Hayes, 2005; Hayes et al., 2012; Tsang et al., 2015; Vollestad et al., 2012). MBIs entrain present-moment awareness to enable an attitude of non-judgement, curiosity, and openness (Baer, 2003; Kabat-Zinn, 2003; Shapiro et al., 2008). Similarly, theatre pedagogy trains an actor to be responsive to their environment in the immediate moment (Barba & Grotowski, 1999; Brook, 1996; Donnellan, 2005; Moffitt, 1999; Schechner & Wylam, 2013). IAw is developed through awareness of physiological sensations and their link to emotions and thoughts. Additionally, through the use of breathing exercises, the ability to regulate one's body, emotions, and thoughts is improved. Both IAw and ER form key components of RH, and MBIs have shown that relationships improve as a result of IAw and ER (Davidson et al., 2000; Goldberg et al., 2022; Khoury et al., 2013; Khoury et al., 2015; Valk et al., 2017). MBIs are in the process of including exercises that develop compassion and empathy for oneself and others to target the relational component of mental health (Kok & Singer, 2017; Singer et al., 2016; Valk et al., 2017). There is a gap within interventions specifically focusing on RH in the context of stressful relationships with significant others. The TBRH intervention specifically addresses RH, IAw, and ER within the context of relationships. Additionally, it utilises adapted character development processes to develop IAw within the context of the relational paradigm. Evidence is emerging that acting training develops socio-cognitive capacities such as empathy (McDonald et al., 2020) and regulation capacities (Goldstein & Lerner, 2018) owing to the embodied nature of the training. Actor training involves techniques and processes that develop the actors' vocal- and physical range and dexterity to develop a character (Barba & Grotowski, 1999; Newlove, 1993; Osiński, 1986; Rodenburg, 2015a, 2015b; Stanislavski, 2012). These include rigorous embodied and perspective-taking processes (Barba & Grotowski, 1999; Donnellan, 2005; Schechner & Wylam, 2013). Additionally, actors train in text analysis for the purpose of character analysis and development (Stanislavski, 2013a).

1.4 The value of adapting theatre pedagogics for IAw development

Theatre pedagogy is inherently relational and situated within an embodied and relational paradigm, potentially making it useful for adaptation for entraining relational IAw.

The TBRH intervention utilises adapted character development processes to develop IAW of one's contextual emotional triggers, and one's early relational paradigm, in order to better understand one's current perspective. In actor training, the character's biography influences the way they engage with others in the present moment (Hilton, 1990; Stanislavski, 2013a). 'Presence' is an essential tool developed within the actor (Brook, 1988, 2017, 2018; Marowitz, 1986). The TBRH intervention additionally introduces a new breathing exercise, the GNLBE, which is designed to improve relational conversations by activating the parasympathetic nervous system (PNS).

In theatre pedagogy, the self is always understood in relation to others (Brook, 1988, 2017; Moore, 1984). Theoretical frameworks within acting produce an awareness of how relationships impact the self so that the actor can respond appropriately as the character within the specific relational context (Moore, 1984; Newlove, 1993; Stanislavski, 2013a). Furthermore, context and given circumstances are always taken into consideration concerning how the character will respond (Stanislavski, 2013a, 2013b). Theatre instruction potentially has a profound ability to enhance socio-cognitive capacities for perspective-taking within a short period.

Additionally, theatre schooling is based on embodied practices that train the actor to inhabit the inner life of their character (Stanislavski, 2013a, 2013b). In MBIs, embodiment is beneficial in improving depression, anxiety, and post-traumatic stress disorder (PTSD), among other disorders (Hjeltne et al., 2017; Hjeltne et al., 2019; Khoury et al., 2013; Mehling et al., 2018; Vollestad et al., 2012). Embodiment refers to being attuned to and inhabiting one's inner life (Farb et al., 2015; Khoury et al., 2017; Price et al., 2011). Consequently, it makes sense to utilise acting processes, which are both embodied and relational, to develop IAW and ER for RH. Studying the details of changes in facial gestures, eye gaze, vocal tone, and physical gait, forms an essential component within theatre pedagogy for character development (Schechner & Wylam, 2013; Stanislavski, 2013b). This training becomes useful in identifying the vocal intonation, facial movements, and signals that trigger different emotions within oneself. Laban (1966) extended actor training through his movement choreutics, a language of movement, which connects the human body to the universal laws of motion in nature and space (Levin, 2006; Newlove, 1993). Laban's movement choreutics (von Laban, 1966) led to both character analysis and character development through using the changes in the continuum of weight, space, time, and flow

(Malgram, 1993-1996). These four categories each extend into a range of permutations that encompass the myriad variations of intentions expressed through human movement (Newlove, 1993). Awareness of the interrelationship between the environment-body-brain triad becomes explicit within actor training and is a useful mechanism for developing IAw.

1.5 Heart rate variability as a neurobiological index for autonomic outflow

Heart rate variability (HRV) is extensively used to measure ER and reactivity in the ANS (Brown et al., 2022; Lane et al., 2009; Thayer et al., 2012). HRV refers to the variability of the inter-beat intervals between successive heartbeats over time (Appelhans & Luecken, 2006). Variability between heartbeats demonstrates healthy cardiac ANS regulation in which the sympathetic and parasympathetic nervous systems interplay to respond quickly to changing environmental stimuli (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). HRV is governed by the ANS, which in turn is modulated by the central autonomic network (CAN), separate disparate regions in the brain, which include the brainstem, limbic, and cortical regions (Appelhans & Luecken, 2006). A flexible ANS that has the ability to modify quickly in response to situational and emotional prompts, resulting in a sign of healthy social adaptability (Appelhans & Luecken, 2006; Geisler et al., 2013). HRV serves as an index for cardiac autonomic regulation (Thayer et al., 2012; Thayer & Brosschot, 2005) and provides further insight into CAN modulation via the prefrontal cortex (PFC) and amygdala loop, which becomes important in ER (Lane et al., 2009; Thayer & Lane, 2009).

1.6 Study aims and objectives

The aim of this study is to test whether a TBRH intervention develops IAw and ER, within the context of stressful relationships and improves RH. RH is defined within this study as the quality of the relationship with oneself and with others. This study hypothesises that entraining IAw with an ER strategy within the context of stressful relationships, that promote compassionate listening to both the self and the other, will improve RH – specifically in the context of challenging relationship dynamics,

Three research questions informed this study leading to three aims and objectives.

1. Does interoceptive awareness change pre to post the TBRH intervention?
2. Does emotion regulation change pre to post the TBRH intervention?
3. Does relational health change pre to post the TBRH intervention?

First aim & objective: To determine whether IAw changes pre to post the TBRH intervention.

Objective: HRV will be used as a neurobiological marker of acute and chronic changes in cardiac ANS regulation pre- and post-intervention. Two self-report questionnaires, the Multidimensional Assessment of Interoceptive Awareness-Version 2 (MAIA-2), which measures multiple elements of IAw, and the Five-Facet Mindfulness Questionnaire (FFMQ), which measures changes in dispositional mindfulness, will provide subjective markers of IAw.

Second aim & objective: To measure in ER changes pre to post the TBRH intervention.

Objective: HRV measures and respiratory frequency will be used as indices of vagal activation. The MAIA-2, FFMQ, and the Self-Compassion Scale (SCS) will measure changes in subjective markers of perceived ER. Correlations between the HRV measures and the questionnaire scores will be used to assess psychophysiological adaptations pre- to post-intervention.

Third aim & objective: To explore participants' experience of the TBRH intervention and whether their RH changed pre versus post-TBRH intervention.

Objective: Qualitative semi-structured interviews will explore improvements in self-awareness and emotion regulation within the context of relationships. The interviews will investigate improvements in the participants' relationships with themselves and others and examine their ability to regulate their emotions within relational contexts.

1.7 Key terms and definitions

1.7.1 Interoceptive Awareness (IAw)

This study employs Craig's (Craig, 2003, 2004, 2010; Craig & Craig, 2009) definition of IAw which encompasses an individual's ability to attune to their inner world consciously. This ability begins with becoming aware of one's internal bodily signals and sensory inputs (Craig, 2003, 2004, 2010; Craig & Craig, 2009; Critchley et al., 2005; Critchley et al., 2004; Damasio, 2003; Damasio et al., 2000; Garcia-Cordero et al., 2017; Herbert et al., 2007; Pollatos et al., 2007a; Pollatos et al., 2007b) and linking these with one's mental activity, including emotions, perceptions, impulses, motivations, and thoughts (Bornemann et al.,

2014; Craig & Craig, 2009; Damasio, 2003; Kok & Singer, 2017). The different substrata within the field of interoception and their contrasting definitions are discussed in Chapter 2.

1.7.2 Emotion Regulation (ER)

ER refers to the ability to be psychologically adaptive in changing circumstances and environments (Appelhans & Luecken, 2006; Holzman & Bridgett, 2017; Thayer & Brosschot, 2005). This study describes this as the capacity to regulate one's body sensations and corresponding emotions and thoughts through a combination of top-down appraisal and bottom-up regulation. Both IAw and ER are capacities targeted and trained within the TBRH intervention specifically for RH.

1.7.3 Relational Health (RH)

RH refers to the quality of the relationship one has with oneself and with others. It confirms the health of the attitude one has toward one's inner life and whether one can connect internally (IAw) and regulate (ER) one's thoughts and emotions for homeostasis and well-being (Craig, 2003, 2004, 2010; Craig & Craig, 2009; Damasio, 2003; Damasio et al., 2000; Goleman & Davidson, 2017). Concurrently, RH describes one's aptitude to form a healthy relationship with another that encompasses empathy, compassion and openness (Davidson & McEwen, 2012; Neff, 2003; Neff & Germer, 2013; Siegel, 2010, 2012, 2016). A relationship with both oneself and another requires flexibility and adaptability to remain in balance within changing social environments (Atkinson, 2013; Craig, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013; Goleman & Davidson, 2017; Lane et al., 2009).

1.7.4 Emotional Triggers

In this study, emotional triggers are defined as strong negative emotions that overpower an individual, leading to uncontrolled reactions and behaviour (Davidson et al., 2000; Shapiro et al., 2008).

1.7.5 Autonomic Nervous System (ANS)

The ANS is made up of the excitatory sympathetic nervous system (SNS) and the calming parasympathetic nervous system (PNS) and a healthy interplay between the SNS and PNS is required to respond quickly to changing environments (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005).

1.7.6 Mindfulness-based interventions (MBIs)

MBIs are mental training programs that develop IAW and ER in participants within a range of settings and diverse populations (Kabat-Zinn, 2003; Khoury et al., 2013; Khoury et al., 2015). MBIs comprise breath and body scan meditations, yoga, mindful walking, and compassion meditation (Goldberg et al., 2022; Kabat-Zinn, 2003; Shapiro et al., 2008). Behavioural interventions began to add mindfulness to their programs, inducting a third wave of MBIs (Hayes et al., 2011; Hayes, 2005; Hayes et al., 2012; Teasdale et al., 2002; Vollestad et al., 2012). These include MBCT, ACT, DBT, and Mindfulness-Based Relapse Prevention (MBRP). The TBRH intervention situates itself in this third wave of novel interventions.

1.7.7 Mindfulness

The term ‘mindfulness’ within this thesis refers to the training of present-moment attention to body sensations, emotions and thoughts in a manner that is curious, open and non-judgmental and nurtures attunement to one’s subjective lived experience (Kabat-Zinn, 2003; Shapiro et al., 2008; Zhang et al., 2021). Mindfulness in this context denotes embodied engagement with the present moment. Studies have shown that this practice of present moment awareness or state mindfulness can increase trait mindfulness over time (Kabat-Zinn, 2003; Shapiro et al., 2008; Zhang et al., 2021).

1.7.8 Embodiment

Embodiment is the process of attuning to and inhabiting one’s internal world including becoming aware of body sensations, emotions, thoughts and motivations (Craig, 2010, Farb et al., 2015; Khoury et al., 2017; Price et al., 2011). Embodiment refers to the direct impact of the mind on the body and its implications on present-moment attention and health behaviours (Farb et al., 2015). Moreover, the brain-body-environment is viewed as an integrated system (Khoury et al., 2017; Pasquinelli, 2006). The neural mechanisms involved in embodiment combine bottom-up and top-down neural processes (Khoury et al., 2017).

1.7.9 Theatre pedagogy

Theatre pedagogy comprises the theories related to the training of actors. In this study, two leading theorists provide insight into the thinking and discussion within the study, namely theatre director and theorist Constantin Stanislavski (Stanislavski, 2012, 2013a, 2013b) and movement theorist Rudolph Laban (Newlove, 1993; von Laban, 1966). Moreover, it is their theories that informed the adapted character development exercises

within the TBRH intervention. Both theorists appraise the discussion on the nature of relationality and embodiment encompassing the triad of the brain-body-environment, respectively (Levin, 2006; Newlove, 1993; Stanislavski, 2013b; von Laban, 1966). The theory is discussed in the context of developing adapted exercises to develop IAw.

1.8 Overview of dissertation structure

This dissertation will employ the following structure:

Chapter 1, the Introduction chapter, presents the rationale for the study with its hypothesis. It establishes an introductory background to the fields of research involved in the study, namely interoception, ER, MBIs, theatre pedagogy, and HRV. These are further elaborated on in *Chapter 2*, the Literature Review. The research questions, aims, and objectives are outlined.

Chapter 2, the Literature Review, presents an in-depth discussion regarding the field of interoception, a theoretical perspective of ER, an overview of MBIs, theatre pedagogy, and its relationship to IAw, and introduces HRV.

In *Chapter 3*, the Methods, the research methodologies utilised in this study for feasibility and acceptability in Study 1, and the effectiveness of the TBRH intervention in Study 2, are presented. The study research designs and procedures are described, followed by data collection and statistical analysis methods. The ethical considerations conclude this chapter.

Chapter 4 presents the results of the pilot study (study 1) and the main study (study 2). For Part 1, Pilot Study, the feasibility and acceptability results are presented, followed by the quantitative behavioural results and a summary of the qualitative findings. For Part 2, Main Study, the HRV results are presented first. Outcomes for HRV at baseline are provided, the Baseline Task results for Groups A, B and C are tabled, and the Relationship Task results for Groups A, B, and C, at time points 0, 1, and 2, are reported. Correlations between HRV and questionnaire data are provided in detail. Second, the behavioural results are reported for all groups at baseline, between groups across the different time points and within groups across the three time points. For Part 3, the qualitative findings of the participants' accounts of their experiences of the TBRH intervention are reported.

Chapter 5 interprets and discusses the corroborative and novel results found in this study. The TBRH intervention targeted somatosensory and socio-cognitive capabilities. Exercises were designed to target IAw, acceptance and regulation of emotions, perspective-taking of self and others, social approach, and engagement behaviours. The HRV correlation

results, in combination with the significant increases in the MAIA-2 and FFMQ, and the personal accounts of the participants, evidenced the development of IAw. HRV verified ER through the GNLBE in the acute intervention in the laboratory. Moreover, ER was shown in the significant increases in the MAIA-2, FFMQ and SCS. Additionally, the participants' descriptions of their experience and utilization of the GNLBE evidenced ER. Finally, RH was demonstrated in the changes in IAw and ER within the context of stressful relationships, and specifically through the participant interviews in which they described their advancement in RH both within themselves and with significant others. The SCS further verified improved self-soothing and social engagement through the HRV correlations with the SCS total score. Limitations of the study are presented and recommendations for future research are suggested.

Chapter 2

LITERATURE REVIEW

The purpose of this chapter is to outline the literature relevant to this study's research questions, hypotheses, and aims. The chapter will begin with a review of the field of interoception. The history of the development of definitions within interoception is discussed to gain understanding of the disparities and growth within the field. Moreover, to understand the different measurements for maladaptive interoception versus healthy interoception. The neural regions involved in interoception are conferred, and discussion on the impact of cultural and social norms and values on the neural processing and experience of interoception are discussed. Finally, theatre pedagogy is discussed in the context of developing interoceptive awareness.

ER is defined and subsequently situated within the different disciplines within psychology. ER strategies are discussed, both healthy and maladaptive as well as within top-down and bottom-up neurobiological processes. The neural regions involved in ER are reviewed. Owing to its prominent role as a mechanism for ER and within MBIs and the TBRH intervention, there is a brief overview on the literature on breathing and ER.

HRV is explained neurobiologically and articulated within the context of emotion research and MBIs. The three theoretical approaches are reviewed.

A comprehensive overview of MBIs and their evolution is described, detailing MBI studies and the growth of MBIs to begin to include interpersonal perspective taking, gratitude and compassion practices for relational health.

2.1 Interoception

2.1.1 Definitions within interoception

Interoception has become a large field of investigation within the neuro- and behavioural sciences (Farb et al., 2015; Farb & Mehling, 2016; Strigo & Craig, 2016). As the research has gained momentum within neuroscience specifically, contradictions and discrepancies emerged, giving way to distinct definitions within the umbrella topic of interoception (Critchley & Garfinkel, 2017; Farb & Mehling, 2016; Khalsa et al., 2018; Mehling, 2016). Moreover, as the field of interoception developed, so too have the definitions become more precise to differentiate between different styles of interoception that correlate with healthy or maladaptive interoception (Farb & Mehling, 2016; Garfinkel et al., 2015; Mehling, 2016).

Seminal research within the field of interoception in the early 2000s defined interoception according to a participant's ability to sense and count their heartbeat (Critchley et al., 2005; Critchley et al., 2004; Pollatos et al., 2007a). Using the well-established heartbeat perception task or heartbeat discrimination task, participants attuned to their heartbeat by counting their heartbeats between two tones or discerning their heartbeats from external tones (Critchley & Garfinkel, 2017; Critchley et al., 2005; Critchley et al., 2004; Pollatos et al., 2007b; Pollatos et al., 2007c; Wiens et al., 2000). Accordingly, the term 'interoceptive accuracy' refers to results produced by this objective measure of counting heartbeats. This was also called and used interchangeably with the term 'interoceptive sensitivity' (Critchley & Garfinkel, 2017; Garfinkel & Critchley, 2013; Garfinkel et al., 2015; Mehling, 2016). 'Interoceptive sensibility', on the other hand, denoted the participants' subjective experience of their ability to attune to their bodily signals measured through self-report questionnaires. Finally, 'interoceptive awareness' was used to indicate the relationship between 'interoceptive accuracy' and 'interoceptive sensibility' – a meta-cognition of their connection (Garfinkel et al., 2015).

In these studies, 'interoceptive accuracy' correlates with a high level of emotional arousal during the presentation of unpleasant, neutral, and pleasant emotional pictures – which is a standardised task for emotion processing (Critchley et al., 2004; Pollatos et al., 2007a). Critchley and colleagues conducted a functional magnetic resonance imaging (fMRI) study using the well-regarded interoceptive measure, the heartbeat detection task, to determine the brain networks involved in interoception (Craig, 2004; Critchley et al., 2004; Herbert et al., 2007; Pollatos et al., 2005; Pollatos et al., 2007b). The right anterior insula cortex (rtAIC) was activated in both the internal and external attention components of the task, suggesting the right anterior insula might integrate internal information with external stimuli, which supports Damasio and Carvalho's notion that the right anterior insula makes explicit the implicit signals of the body (Damasio & Carvalho, 2013). Critchley et al. (2005) extended these findings in an fMRI study using emotional faces to provide evidence corresponding with related heart rate and brain activity, using a forewarned reaction time task. They produced evidence that different emotions evoke different physiological responses, which is reverberated in research produced by Pollatos et al. (2007) in a study measuring heart rate response to emotional pictures. The study provided evidence that angry and sad pictures decelerated heart rate (HR) and showed a higher magnitude of arousal than happiness and disgust, which accelerated HR. Critchley and colleagues, therefore, illustrated

the impact of emotional stimuli (in this case, emotionally expressive faces) on cardiac activity and areas of the brain involved in the visual processing of facial expressions and emotional learning for subsequent social adaptation (Critchley et al., 2005). The AIC is strongly implicated in this cardiac modulation together with the amygdala, which is centrally involved in autonomic arousal to emotional stimuli, both negative and positive (Davidson, 2002; Davidson & Irwin, 1999; Lee et al., 2012). Distinct regions within the amygdala respond to distinct aspects of arousal (LeDoux, 2007). Moreover, the amygdala is directly involved in prompting cortical association of pertinent stimuli (Critchley et al., 2005; Davidson & Irwin, 1999; LeDoux, 2007).

While producing formative research of the neural correlates of emotion processing within neuroscience, the heartbeat perception and discrimination tasks measure a component of interoception within its broad definition and exclude the attunement to emotions and mental activity. These distinctions within interoception clarify the differences between somatosensory interoception – in which the heartbeat and stomach sensations are detected, and which has been linked to emotional expressiveness and emotional awareness versus interoception associated with emotional awareness and ER (Craig & Craig, 2009; Immordino-Yang & Gotlieb, 2017). Furthermore, the subjective measure of ‘interoceptive sensibility’ focused on the maladaptive components of interoception associated with clinical syndromes and was measured using the Porges Body Perception Questionnaire (Kolacz et al., 2018), which measures the maladaptive components of bodily interoception (Mehling, 2016).

The above definitions and research failed to include the regulatory and motivational components within interoception that Craig began to produce evidence for during the same period (Craig, 2003, 2004, 2010; Craig & Craig, 2009). Interoception within these studies comprised a combination of physiological, homeostatic, and motivational progressions (Craig, 2004, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013; Strigo & Craig, 2016). Moreover, to address the need for an interoceptive measure that targets the multiple constructs within IAw, including the appraisal, integration, and regulatory elements within the construct, Mehling and colleagues developed the Multidimensional Assessment of Interoceptive Awareness to include the health and regulatory components of IAw targeted through MBIs and mind-body therapies (Mehling, 2018; Mehling et al., 2012).

This definition of interoception refers to inhabiting mindful and regulatory capacities (Farb & Mehling, 2016; Mehling, 2016). Interoception, or what will now be referred to as ‘interoceptive awareness’, involves paying attention to internal subjective experiences, which includes bodily sensations, emotions, thoughts, impulses, and motivations in the present moment, to consciously regulate and adapt one’s appraisal of internal bodily signals towards homeostasis (Bornemann et al., 2014; Craig, 2010; Craig & Craig, 2009) for social flourishing. With this definition, IAw is preparative to the regulation of emotions (Craig, 2010; Craig & Craig, 2009; Damasio et al., 2000; Davidson & McEwen, 2012; Seth, 2013).

2.1.2 Neural regions involved in interoception

Craig posits that feelings are the mental aspects of bodily conditions that ignite physiological drives for homeostatic efficiency (Craig, 2003, 2004, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013). The sensory and visceral representations of feelings ascend the spinal cord via the lamina-1 spinothalamocortical pathway and are initially mapped somatotopically in the dorsal posterior insula. These representations are then integrated into the mid-insula in amalgamation with other brain localities within the thalamus and dorsal cingulate cortex to emerge in the right anterior insula – in what Craig refers to as a ‘global emotional moment’, the synthesis of all feelings in the present moment, a ‘meta-awareness’ of the self in the now (Craig, 2004, 2010; Craig & Craig, 2009). Craig refers to this as ‘the sentient self’ which signifies subjective conscious experience (Craig, 2010). This interoceptive system forms part of the homeostatic mechanism of the body and is intricately connected to the CNS (Craig, 2010; Craig & Craig, 2009; Damasio, 2003; Damasio & Carvalho, 2013).

The AIC has been shown to be activated during interoception (Craig, 2003; Craig & Craig, 2009; Damasio & Carvalho, 2013). Specifically, the right-side AIC has been correlated with negative interoceptive affect (Critchley et al., 2004) and the left-side AIC with positive interoceptive affect (Craig, 2003; Craig & Craig, 2009). Situated within the Sylvian fissure of the lateral sulcus, the insula sits at the intersection of the frontal, temporal, and parietal lobes, affording it diverse and far-reaching cortical connectivity (Craig, 2010). Accordingly, the insula cortex is referred to by Craig (2010) as a ‘cortical island’, extending in the cerebral cortex to sub-cortical areas in the amygdala and hypothalamus and through to the brainstem (Craig, 2004, 2010; Craig & Craig, 2009).

Moreover, the mid-insula has been correlated with the neural regions involved in HRV (Thayer et al., 2012; Zhang et al., 2014). The AIC does not work in isolation but rather is co-joined in activity with the ACC for subjective awareness, emotional awareness, and emotion processing (Craig & Craig, 2009; Damasio & Carvalho, 2013; Gu et al., 2013; Medford & Critchley, 2010; Seth, 2013). The subgenual portion of the ACC is involved in determining the salience of autonomic activity and motivating behaviour that will bring the person into balance (Medford & Critchley, 2010). Where the AIC is considered the limbic sensory cortex, the ACC is thought of as the limbic motor cortex. They are co-activated, with the former enabling the appraising of the moment and the latter enabling the initiation of the consequent behaviour (Craig, 2010; Damasio & Carvalho, 2013; Gu et al., 2013). The ACC provides the motivational drive for the action or behaviour derived from the sensation received by the AIC. Both the AIC and ACC contain large-sized Von Economo neurons, which enable faster transmission of messages and added connectivity (Damasio & Carvalho, 2013).

The afferent information processed by the AIC enables the ACC to generate the appropriate behavioural output to attain social flourishing (Craig & Craig, 2009; Damasio & Carvalho, 2013; Gu et al., 2013; Seth, 2013). Additional and critical input from the vmPFC is required to ascribe salience to the events and behaviour on potential aversive or adaptive outcomes (Damasio & Carvalho, 2013).

There is evidence that there are two routes for a feeling to be generated as a mental representation within the AIC. The first follows a trigeminal lamina-1 spinothalamocortical trajectory and activates the SNS, whereas the second goes via vagal afferents (Craig, 2003; Craig & Craig, 2009; Strigo & Craig, 2016). This proffers interesting possibilities within neuroscientific and behavioural research to examine ways to activate parasympathetically driven representations that enable social engagement, ER, and social connectivity (Strigo & Craig, 2016).

2.1.3 The impact of socio-cultural influences on interoceptive awareness

Studies have shown that autonomic arousal is connected to social engagement (Geisler et al., 2013; Grippo et al., 2007; Porges, 2003; Porges, 2009). Moreover, autonomic processing is impacted by family and cultural norms (Immordino-Yang & Gotlieb, 2017; Immordino-Yang et al., 2014; Ma-Kellams, 2014; Yang & Immordino-Yang, 2017). Studies have shown the effect of cultural models in the distinctions within processing interoceptive

signals within Eastern and Western cultures (Freedman et al., 2021; Immordino-Yang & Gotlieb, 2017; Maister & Tsakiris, 2014). Freedman and colleagues conducted focus groups with bi-cultural Japanese-Americans, who identified equally with both cultures and lived and moved between them interchangeably (Freedman et al., 2021). The interviews explored the participants' experience of the Multidimensional Assessment of Interoceptive Awareness (MAIA) in a previous study conducted by Shoji and colleagues (Shoji et al., 2018). Differences in the processing of interoceptive signals were expressed by the Japanese-American participants regarding body awareness, which translated differently for the Japanese culture in comparison to the Western American culture. Specifically, the self-regulation component of IAw was difficult for Japanese participants to grasp, owing to their cultural convention of regulating themselves for social contexts and situational demands (Freedman et al., 2021). In contrast to this, Western cultures use the body as a place to regulate body sensations, emotions and thought sensations to bring the individual back into homeostasis. Furthermore, body awareness is interpreted differently within Japanese culture, in which external form and presentation are upheld for social expectation – it is an external awareness rather than an internal awareness that governs internal behaviour and interoceptive processing. Additionally, sensations and emotions are often regarded as neutral owing to the focus of one's internal world being to conform to external social expectations. In this cultural schema, the formation of identity and self-understanding are formed through interdependent and communal agreements, as opposed to an individual concept as determined in the West. These differences are reflected in both the different understandings and processing of IAw (Freedman et al., 2021).

A series of studies investigated the role of socio-cultural influence on IAw (Freedman et al., 2021; Immordino-Yang & Gotlieb, 2017; Immordino-Yang et al., 2014; Ma-Kellams, 2014; Yang & Immordino-Yang, 2017). The results showed that distinct components of IAw were attributed to different sections of the AIC, an area of the brain associated with the processing of bodily signals and sensory information for different cultures. The dorsal section of the AIC corresponded to sensing the heart and gastrointestinal tract, whereas the ventral area of the AIC was activated with the induction and regulation of emotion (Immordino-Yang & Gotlieb, 2017). Importantly, these studies demonstrated the implications of socio-cultural influence on interoceptive processing, and the different neural routes that are activated. In an fMRI study, in which responses were captured in response to the intensity of a range of social emotions within stories, Immordino-Yang and colleagues found that the Chinese students at a

University in Beijing, and the Western American students at a University in America, processed emotion via different neural routes. The Asian students responded via the ventral AIC, whereas the American students responded via the dorsal AIC (Immordino-Yang & Gotlieb, 2017). The valence of the emotions, however, was reported to be the same. This was further verified with students of Asian descent (but born and raised in the United States of America) who responded like their American peers via the dorsal AIC. In contrast, an additional study showed a neural correlation to the culture to which the youth identified most (Immordino-Yang & Gotlieb, 2017).

Distinctions in IAw and interoceptive accuracy within Asian and Western cultures were further found in a review by Ma-Kellams (2014), with implications for how culture impacts how the body is appraised. However, the definitions for IAw within these studies are limited to sensing visceral signals from the internal milieu and do not encompass emotions, thoughts, motivations, and impulses (Ma-Kellams, 2014). The study, therefore, emphasises the importance of the TBRH intervention in guiding participants to understand how the impact of their early sociocultural experiences influences their perceptions of others as adults.

2.1.4 Theatre pedagogy and interoceptive awareness

Theatre pedagogy entrains awareness of the internal milieu of both the actor and the character through becoming aware of the sensations, mental activity and emotions of their internal landscape, contrasted against the characters and their associated behaviours (Moore, 1984; Stanislavski, 2013a). This training is extended to identify how internal sensations, mental activity, and emotions change in response to different relationships (Moore, 1984; Stanislavski, 2013a). A range of exercises, including yoga, martial arts, movement, sensory awareness, breathing exercises, games, and improvised play, entrain moment-to-moment awareness where whole body-mind engagement is occupied with the immediate moment, free of past or future thinking (Brook, 1996; Lecoq & McBurney, 2002; Levin, 2006; Moffitt, 1999; Rodenburg, 2009; Schechner & Wylam, 2013). Actors develop the capacity to attune and respond to their environment in an engaged manner in which an impulse translates immediately into action without being hindered by thought (Barba & Grotowski, 1999; Brook, 1996; Moffitt, 1999; Schechner & Wylam, 2013). In this way, choices are made in rehearsal that emerge from implicit knowledge deep within the body-brain system rather than from the neocortex alone. Moreover, actors are trained to carry a meta-awareness of their inner self versus the character's inner self so that the actor will not impose their perspective

paradigm onto the character in the development phase. Importantly, the actor is trained not to judge the character but rather to observe their behaviour and find meaning within it in order to embody it wholly without judgment. In addition, within the performance phase, the actor works with a dual focus, activating the prompts that have been chosen to ignite the inner life and outer behaviour of the character and respond to what is playing out on stage (Hilton, 1990; Moore, 1984; Stanislavski, 2013a). This dual focus embeds the necessary meta-awareness, which prevents an actor from losing the distinction between real life and performance.

Laban's movement choreutics is a system that trains the actor to attune to their internal bodily signals and how they interact with external stimuli to produce movement (von Laban, 1966). Laban suggests that each movement comprises the internal intention, conscious or unconscious, of the individual and reflects in physical space their approach or withdrawal response to the object or individual with whom they are engaging (Malgram, 1993-1996; Newlove, 1993; von Laban, 1966). This interactive attunement utilises IAw; the external movement reflects an internal impulse. The theatre director, Constantin Stanislavski, devised a model for the psychological motivation of behaviour that complements Laban's movement theories (Moore, 1984; Stanislavski, 2012, 2013a). Cognition within this model is regarded as the antecedent of emotion. To activate the appropriate emotion or emotional sequence of a character to the corresponding thought or set of thoughts, the internal monologue must be discovered (Stanislavski, 2012, 2013a). Understanding the mental, emotional, and physical gravitational pull towards or away from another person underlies each beat (a sub-unit of the whole) within a scene for the actor (Stanislavski, 2013a). Davidson and Irwin (1999) describe this as the withdrawal-approach model in which distinct neural circuitry is activated for appetitive and approach responses versus aversive and withdrawal responses. Within theatre pedagogy, both theorists, Laban and Stanislavsky, provide tools used by actors and directors to develop IAw.

Laban's theories seem to be elucidated in neuroscience by Craig (Craig, 2003, 2004, 2010; Craig & Craig, 2009) and Damasio (Damasio, 2003; Damasio, 2011; Damasio & Carvalho, 2013; Damasio, 1996; Damasio et al., 2000) with regard to the continuous interplay between the internal milieu of the body-brain system and the external environment. Physiological, emotional, and mental homeostasis is translated into a kinetic formula, which expresses the organism's implicit move towards spatial harmony (Newlove, 1993; von Laban,

1966). The complexity of the continuous interplay between the internal milieu of the body and the external environment for homeostasis sheds light on the potential reason behind the complexity of interpersonal relationships. Our perceptual maps and consequent reactivity have been formed early on in our lives and remain unconscious (Seth, 2013; Seth & Friston, 2016).

2.2 Emotion regulation

ER is the ability to remain in balance emotionally and mentally in response to changing contexts and diverse situational and social demands (Appelhans & Luecken, 2006; Lane et al., 2009). It demonstrates an individual's adeptness to monitor (IAw) and adjust (regulate) their reactivity and behaviour in relation to self and others, which is essential to RH (Goldin et al., 2008; Gross, 1998).

ER falls within the umbrella term 'self-regulation', which denotes an autonomic system that is flexible and adaptive to changing stressors and environments (Holzman & Bridgett, 2017; Park & Thayer, 2014). It refers to the cortical inhibition of sub-cortical areas to inhibit a threat response and aid adaptation (Hajcak et al., 2010; Thayer & Brosschot, 2005). Moreover, it references a bi-directional movement in which visceromotor and somatosensory signals inform top-down motivation of the self-regulation of the ANS (Holzman & Bridgett, 2017; Park & Thayer, 2014; Porges, 2009; Thayer & Brosschot, 2005). Self-regulation is the umbrella term for the different methods of bringing the ANS into balance, using both healthy and maladaptive strategies (Brown et al., 2022; Gross, 1998; Gross & John, 2003; Hansen et al., 2004; Hildebrandt et al., 2019).

In Gross' integrative review of ER, he maps its wide significance across psychological disciplines, clarifying the combination of unconscious and conscious mechanisms that interplay within ER processes that emerge at different parts of the emotion-generating trajectory. Within health psychology, the sustained suppression of negative emotion over time has been shown to result in the onset of physical illness (Cohen-Katz et al., 2005; Gross, 1998; Pace et al., 2009), and within clinical psychology, it is attributed to the development of mental health problems and illnesses, including anxiety (Hjeltne et al., 2017; Hjeltne et al., 2019; Vollestad et al., 2012), depression (Keyworth et al., 2014; Koch et al., 2019), and substance abuse (Agarwal et al., 2015; Himelstein et al., 2015; Witkiewitz et al., 2013). Developmental psychology emphasises the early relationship between caregiver and

child in the development of the child's appraisal of contextual cues and their subsequent emotional response tendencies (De Witte et al., 2016; Gross, 1998; Porges & Furman, 2011). Personality psychology illustrates the individual differences in emotional responses and expounds on the individuals' role in shaping their behaviour to control negative affect and promote positive affect (Gross, 1998). ER is more often than not an unconscious response to one's life events and subjective lived experience (Damasio & Carvalho, 2013; Seth, 2013; Seth & Friston, 2016). Gross' research compliments Craig and Damasio's research (Craig, 2010; Craig & Craig, 2009; Damasio & Carvalho, 2013) with regard to the individual's implicit appraisal of external stimuli for internal adjustments for social adaptation.

2.2.1 Emotion regulation strategies

In a set of five studies, Gross and John (2003) examined two distinct ER processes and their effects on personal well-being, relationships, and affect. The models correspond with different response tendency processes that are utilised consciously and unconsciously. Cognitive reappraisal, which happens early on in the emotion-generating process, involves the appraisal of an environmental stimulus and the adaption of one's behaviour early on in the emotion-generating process for a positive effect. Emotional suppression happens much later in the emotional generating progression and serves to inhibit the affective response that is already set in motion as a result of the contextual cue (Gross & John, 2003). Cognitive reappraisal is considered to be an antecedent-response strategy and is associated with positive wellbeing, healthy social relationships and positive affect, while emotional suppression is associated with a response-focused strategy that produces an accumulative negative impact on self-esteem, authentic expression and social bonding (English et al., 2012; Gross & John, 2003). Rather than observing one's reactivity and reappraising the situation for well-being, i.e., problem-solving, one suppresses the effect, which over time will have maladaptive consequences. A third ER strategy has emerged with compassion research (Dahm, 2017; Neff, 2023). Compassion training generates an ER strategy that is neither appraisal nor suppression-based but rather develops through being present with difficult emotions while simultaneously developing affirmative affect and connection to others (Braehler & Neff, 2020; Neff, 2016a; Neff, 2023; Neff & Germer, 2013). In this approach to ER, inhabiting one's vulnerability enables moving through it and bringing oneself back into equanimity.

ER can be developed through both cognitive and affective practices. While both improve self-regulation, they target different facets of ER (Hildebrandt et al., 2019). In a

longitudinal study known as the Resource Project, three different mental training interventions were conducted over nine months, each for a three-month period (Singer & Engert, 2018; Singer et al., 2016; Valk et al., 2017). The Perspective-Taking module targeted cognitive appraisal of self and others and improved ER in participants with regard to reappraisal strategies and a tendency towards acceptance of difficult emotions. In contrast, the Affect module cultivated a strong acceptance of negative emotions together with a decrease in avoidance of adverse feelings (Hildebrandt et al., 2019). The latter practice focuses on growing positive affect, and studies show this to have a significant impact not only within the individual but also within their capacity to offer help to others (Hildebrandt et al., 2017; Klimecki et al., 2012; Leiberg et al., 2011; Verdejo García et al., 2011).

This corresponds to the neuroscientific evidence that shows compassion practices activate deep structures within the brainstem that activate ‘the care network’, namely the ventral tegmentum and substantia nigra (Böckler et al., 2016; Klimecki, 2015; Klimecki et al., 2013). Furthermore, compassion practices initiate bottom-up training rather than the top-down training associated with perspective-taking and Theory of Mind (TOM; Klimecki et al., 2014; Singer & Engert, 2018; Singer & Klimecki, 2014; Valk et al., 2017).

2.2.2 Neural regions involved in emotion regulation

Emotional activation and ER are mediated by the ANS, which comprises the excitatory SNS and the inhibitory PNS. These two autonomic branches continuously interplay with one another to respond appropriately to situational demands and challenges and innervate cardiac activity (Appelhans & Luecken, 2006; Lane et al., 2009; Thayer & Brosschot, 2005). The ANS is modulated by the CAN in the brain, which includes the brainstem regions (nucleus of the solitary tract, parabrachial nucleus, periaqueductal grey and ventrolateral medulla), the limbic regions (hypothalamus, central nucleus of the amygdala, bed nucleus of the stria terminalis) and the cortical regions (insula and medial prefrontal cortices) (Appelhans & Luecken, 2006). A flexible ANS that can modulate quickly to environment and emotional prompts is a sign of healthy social adaptability (Geisler et al., 2013; Kok et al., 2013).

Extant literature shows that the cortical and limbic circuitry are linked in emotional activation and regulation (Davidson et al., 2003, Davidson et al., 2000, Thompson & Varela, 2001). The PFC serves to restrain negative impact in the amygdala, a key subcortical area in

the limbic system that is associated with fear and threat reactivity (Jackson et al., 2003). The amygdala is central in emotional cues, particularly regarding threat and fear (Davidson & Irwin, 1999; LeDoux, 2007). Right-side activation of the amygdala at baseline indicates a propensity for anxiety, a quicker uptake of negative cues and a slower recovery from a negative elicitor (Davidson et al., 2000). Activation of the asymmetrical left-sided PFC indicated a propensity for positive affect and a quicker recovery from an emotional stimulus (Davidson et al., 2000; Davidson et al., 2003). Numerous studies show left-sided asymmetrical PFC activation is implicated in healthy ER, in particular regarding fast recovery from an emotional elicitor (Davidson, 2002; Jackson et al., 2003; Urry et al., 2004). Several studies indicate baseline left prefrontal activation relates to positive affective style and resilience to life stressors (Davidson et al., 2003; Urry et al., 2004.).

2.2.3 Breath

A growing body of literature posits breath as a strategy for ER (Bing-Canar et al., 2016; Doll et al., 2016; Levinson et al., 2014; Lutz et al., 2008; Zaccaro et al., 2018). The breath serves to activate the psychophysiological development of internal awareness of bodily signals, self-monitoring, self-awareness of mental and emotional activity, and ER (Davidson & McEwen, 2012; Doll et al., 2016; Hayes, 2005; Keyworth et al., 2014; Long & Christian, 2015a; Tang & Posner, 2012a; Vollestad et al., 2012).

Breathing and its impact on healthy adaption to life stressors, as well as the ability to stay emotionally regulated amidst adverse conditions is a powerful underlying mechanism at play within the extant literature on mindfulness interventions (Busch et al., 2012; Doll et al., 2016; Jerath et al., 2006; Lutz et al., 2008). Breathing serves to activate the psychophysiological development of cognitive defusion, conscious awareness, internal attunement of bodily signals, self-monitoring, and awareness of mental and emotional activity (Keyworth et al., 2014; Long & Christian, 2015a; Querstret et al., 2020; Vollestad et al., 2012).

Increasingly, studies specifically investigate deep, slow breathing in various formats using HRV and electroencephalography (EEG) measures (Bing-Canar et al., 2016; Busch et al., 2012; Jerath et al., 2006; Lin, 2018; Zaccaro et al., 2018). Breathing interventions have been measured extensively through HRV (Gross et al., 2016; Prinsloo et al., 2013a; Shearer et al., 2016). In a study by Gross and colleagues, support staff and management of elite athletes

had five practise and practitioner-led HRV biofeedback sessions and the equivalent in-home practice. Participants' standard deviation of normal to normal (SDNN), total power (TP) and low frequency power (LFP) increased during the HRV biofeedback session post the training. Moreover, post-intervention participants demonstrated an increased use of somatic ER strategies when stressed (Gross et al., 2016). This increase in autonomic regulation was also shown in a study with dance performers who underwent ten HRV biofeedback sessions for 20 minutes (Gruzelier et al., 2014). Results showed increases in SDNN during the breathing protocol versus the control group, and the dancers exhibited increased performance presence. Additionally, the dancers' state anxiety decreased as a result of the HRV biofeedback (Gruzelier et al., 2014). Similar results are evidenced by Van Diest and colleagues (2014), who assessed the impact of the inhalation/exhalation ratio with slow breathing and found that the LF component in the cardiac spectrogram increased at six breaths per minute (Van Diest et al., 2014). These studies further established the parasympathetic influence of slow breathing on the ANS. These results are further corroborated in a systematic review of the impact of slow breathing interventions on HRV measures, in which SDNN and the LF and high frequency (HF) components in the cardiac spectrogram increased depending on the inhalation/exhalation ratio and the duration and type of breathing intervention (Zaccaro et al., 2018).

In a study investigating a short mindfulness-of-breathing exercise on participants' ability to self-monitor whilst performing a cognitive task, Bing-Canar et al. (2016) used EEG to test their hypothesis. They found alpha frequency increased significantly, promoting relaxed internally-focused alertness, a condition that did not occur with the control group who only listened to instructions on mindfulness (Bing-Canar et al., 2016). Jerath et al. (2006) found beneficial effects of pranayama breathing on cardiovascular, pulmonary, autonomic, and psychological functioning in their investigation of the neural mechanisms that are activated through this breathing practice. The authors suggest that the 'parasympathetic-type phenomenon' that is activated by deep, slow breathing synchronises cardiac and pulmonary activity and that this mechanism possibly rebalances the ANS in its entirety (Jerath et al., 2006). Similarly, in an experiential study using EEG, voluntary controlled breathing with eyes open and eyes closed produced alpha activity that corresponds with a state of vigour-activity that is similar to the state of readiness produced in Zen meditation (Fumoto et al., 2004). EEG alpha frequency has been linked to activation of the left-sided PFC asymmetry, which is indicated in positive affect and well-being (Davidson et al., 2000; Davidson et al.,

2003; Davidson, 2000; Urry et al., 2004). This alpha frequency is also associated with a state of presence, a relaxed alertness to one's internal and external environment (Davidson et al., 2003). This shift in alpha frequency is supported in a study by Busch and colleagues, who experientially tested two deep and slow breathing interventions (DSB) on pain threshold, autonomic regulation and mood. In both groups, participants were taught deep and slow diaphragmatically breathing. In the relaxing DSB intervention, participants focused on the awareness of their breathing, while in the attentive DSB, participants were asked to match breathing to a task that requires consistent monitoring and concentration. The former proved more effective pertaining to increasing the participants' pain threshold and enhancing indices of parasympathetic activity than when breathing was combined with a complex, externally focused, task (Busch et al., 2012).

ER refers specifically to bringing into balance negative affect (Gross & John, 2003; Park & Thayer, 2014) and returning the ANS to equilibrium (Ochsner & Gross, 2008). There are multiple ways to achieve ER, both top-down processes, such as cognitive reappraisal (Gross & John, 2003; Ochsner & Gross, 2005) and bottom-up processes, such as embodied awareness and breathing (Bornemann, 2017; Bornemann et al., 2019; Khoury et al., 2017) and integrative compassion-based processes (Hofmann et al., 2011; Neff, 2023). The literature on IAw and ER suggests that placed together within a behavioural intervention which incorporates theatre pedagogy may promote regulated communication for RH.

2.3 Heart Rate Variability (HRV)

HRV reflects the interplay of SNS activity and PNS activity on the HR (Appelhans & Luecken, 2006; Lane et al., 2009; Thayer & Brosschot, 2005). Variability in the changes between successive heartbeats is a sign of a healthy ANS (Appelhans & Luecken, 2006; Delgado-Pastor et al., 2013). HR is governed by the ANS and the variability between the inter-beat intervals between successive heartbeats, reflecting the adaptability of the ANS to respond to changing environments and situational and social demands (Shaffer et al., 2014; Thayer et al., 2012; Thayer & Brosschot, 2005). This adaptability of the ANS to respond to changing environments occurs via the CAN, comprising cortical, limbic, and brainstem areas involved with the appraisal, integration and regulation of physiological sensations and emotional responding that furthermore integrates the impact of executive, affective and physiological processes on the ANS (Appelhans & Luecken, 2006). The SNS activates the heart via the spinal cord and makes use of the neurotransmitter norepinephrine, which has a

slower transmission of activation on the heart. In contrast, the PNS directly activates the heart via the cranial nerve 10 (i.e., not via the spinal cord) and makes use of acetylcholine, which has a faster release and impact on the heart (Berntson et al., 1997). The variability of this interplay between the SNS relative to PNS cardiac activation in response to the environment is reflected in HRV and can be altered through MBIs, which target the growth in ANS flexibility through IAW and ER capacities (Balzarotti et al., 2017; Christodoulou et al., 2020). ER has been shown in HRV research in which autonomic outflow was mapped to enable an understanding of the interplay of the sympathetic and parasympathetic influences on the heart over time (Holzman & Bridgett, 2017; Park & Thayer, 2014). ER gives insight into the speed of recovery from a stressor, where a faster recovery indicates the individuals' adaptive ability in the moment, a signal of healthy ANS regulation (Appelhans & Luecken, 2006; Park & Thayer, 2014; Thayer & Brosschot, 2005). Williams and colleagues (2015) found vagally mediated HRV measured at baseline at rest was a predictor of healthy ER; specifically, in the areas of emotion clarity and the ability to inhibit impulsive behaviour during resting state, as measured by the 'Difficulties in Emotion Regulation Scale', while simultaneously being controlled for trait anxiety and rumination. Interestingly, motivation might be a factor within healthy or maladaptive ER (Williams et al., 2015).

HRV has been used extensively in emotion research and MBIs as an objective marker of ER due to it being a non-invasive and inexpensive measurement (Balzarotti et al., 2017; Christodoulou et al., 2020; Holzman & Bridgett, 2017; Shaffer & Ginsberg, 2017). Previous studies measuring mindfulness techniques have found it to be associated with an increase or no change in both the HF (0.5-0.15Hz) and LF components (0.15-0.04Hz) of the cardiac spectrogram, both of which are indices of vagal activation (Prinsloo et al., 2013a; Prinsloo et al., 2013b). Moreover, mindfulness studies have also evidenced changes in the time domain, such as an increase in SDNN, indicating an increase in parasympathetic activation (Brown et al., 2021; Christodoulou et al., 2020; Prinsloo et al., 2013a; Prinsloo et al., 2013b).

Mindfulness techniques have been employed in clinical and non-clinical trials, and both have used HRV measures to assess improvements in ANS flexibility and the covariant health-related symptoms (Brown et al., 2021; Brown et al., 2022; Christodoulou et al., 2020; Shearer et al., 2016; Sloan et al., 2017). However, it is important to note that there is a great deal of variability in the HRV protocols and assessments, which makes comprehensive reporting on the usage of HRV – as an index to assess ANS regulation and health and wellbeing - challenging. For example, the gold standard duration of recording ECG to

produce validated and repeatable HRV measures is five minutes, a recommendation that is not always possible to adhere to, making results difficult to interpret (Christodoulou et al., 2020; Quintana & Heathers, 2014). A research design that includes an active control group is optimum, and randomised controlled trials (RCT) are more effective than quasi-experimental trials (Christodoulou et al., 2020; Quintana & Heathers, 2014; Shaffer & Ginsberg, 2017). HRV can be measured tonically or phasically, with phasic segments, such as during- and post-breathing, or during a mental or emotional challenge, having a greater impact on HRV changes than tonic HRV measurements, such as during a resting state exercise in which HRV would not change much (Christodoulou et al., 2020). HRV measures are, therefore, useful objective markers of cardiac ANS reactivity during a challenge and for recovery from a challenge.

2.3.1 Theoretical approaches to HRV

There are two main theories put forward to explain the neural underpinnings of HRV: Neurovisceral Integration and Polyvagal Theory. Neurovisceral Integration explains the bidirectional relationship between cardiac activity and the neural structures governing the input into the sinoatrial node from the stellate ganglia and vagus nerve (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). Neurovisceral Integration is a computational model that demonstrates the relationship between the brain and the heart which can be assessed through HRV – the inter-beat-intervals (IBI) between heartbeats (Thayer & Brosschot, 2005; Thayer & Lane, 2009). This variability between HR is governed by the CAN which encompasses neural networks involved in executive attention and affective regulation, both of which include structures within the salience network (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). Consequently, HRV can serve as an index for PFC and sub-cortical interactions, providing insight into the mechanism of the inhibitory PFC on the sub-cortical regions activated with negative affect or threat, both real and perceived (Lane et al., 2009; Park & Thayer, 2014; Thayer & Brosschot, 2005).

Porges' Polyvagal Theory puts forward a phylogenetic evolutionary model of the ANS and its reflection within the rhythm and time series of the heart (Porges, 2003; Porges, 2007, 2009). According to the Polyvagal Theory, the PNS expanded into two distinct branches to accommodate the development of increasing complexity within our social engagement system, promoting social bonding (Porges, 2003; Porges, 2009). An older dorsal motor nucleus contains neurons with unmyelinated nerves that govern the immobilisation response,

and a more recent ventrally located nucleus, the nucleus ambiguus, contains neurons with myelinated nerves that promote soothing, safety, and calm (Porges, 2009; Porges & Furman, 2011). This newer branch of the vagus nerve is governed by higher-order cortical circuits which scan the environment for threatening or safe social cues, a process Porges termed ‘neuroception’ (Porges, 2009). Porges further posits that the development of this newer branch of the vagus nerve equips the human infant neurobiologically to seek soothing and safety through facial gestures, eye gaze, head movement, and vocal tone (Porges, 2003; Porges & Furman, 2011). These cortical neural pathways advance from the motor cortex to exhibit control over the source nuclei within the brainstem, connecting the heart and lungs with facial, head and neck muscles, activating a “face-heart connection” (Porges, 2007). If communication is met with the appropriate reciprocal signals, the myelinated vagus branch works to regulate the physiological state. However, if communication is not returned, the SNS will take over to regulate the physiological state, promoting a stress response (Porges & Furman, 2011). Over time, these autonomic responses become patterned, affecting interpersonal connectivity (Porges, 2007). In humans, when an infant is born, ingestive feeding is the primary mode of self-regulation and is governed by the brainstem-viscera circuits. From six months, the social dyad replaces ingestive feeding to become the primary mechanism for regulating physiological states (Porges & Furman, 2011). Both theories – Neurovisceral Integration and the Polyvagal Theory – explicate the brain-heart connection.

The most recent theory proposed by Laborde and colleagues, the Vagal Tank Theory, emphasises the self-regulation component of the vagus nerve and how it interplays with the environment during ‘rest, reactivity and response’ (Laborde et al., 2018a; Laborde et al., 2018b). The vagus nerve is regarded as a metaphor for a tank that stores self-regulatory capacity, and depending on the capacity, the individual will respond better to a stressful demand within the environment, which is reflected in HRV (Laborde et al., 2018b). This function can be measured with HRV at rest, during a challenge and in recovery, and can become more efficient through interventions that target a more effective ANS (Christodoulou et al., 2020; Laborde et al., 2018a).

2.4 Mindfulness-based interventions (MBIs)

2.4.1 Overview of the field

In the growing field of contemplative science, research is being conducted on MBIs that promote psychological flexibility and improve intra- and interpersonal health (Baer,

2003; Goldberg et al., 2022; Kabat-Zinn, 2003; Khoury et al., 2015; Querstret et al., 2020; Shapiro et al., 2008; Vollestad et al., 2012; Zhang et al., 2021). MBIs have established efficacy in enhancing RH by targeting IAW of implicit response tendencies, ER and the re-education of behavioural choices (Bockler et al., 2017; Hildebrandt et al., 2017; Kabat-Zinn, 2003; Kok & Singer, 2017; Shapiro et al., 2008; Singer et al., 2016). Interpersonal health becomes a consequence of intrapersonal health. A central mechanism within MBIs is entraining present-moment awareness, defined as a state of moment-to-moment presence that is open and non-judgmental and cultivates a sense of curiosity and openness to one's subjective lived experience (Cohen-Katz et al., 2005; Kabat-Zinn, 2003; Long & Christian, 2015b; Shapiro et al., 2008; Zhang et al., 2021). In a systematic review and meta-analysis of MBIs in non-clinical populations, specifically MBSR and MBCT (the MBIs with the most scientific evidence), there were significant decreases in rumination and worry, depression, anxiety, and stress, as well as an increase in quality of life and positive well-being (Querstret et al., 2020). Moreover, mindfulness increased both as a unidimensional construct and multifaceted construct, measuring the distinct elements of 'observing', 'describing', 'acting with awareness', 'non-reactivity to inner experience', and 'non-judgement of inner experience' (Querstret et al., 2020). To understand the role of mindfulness in MBIs, a comprehensive effect-size meta-analysis was conducted with 209 studies that targeted positive outcomes with depression, anxiety, stress, pain, and cancer in non-clinical populations (Khoury et al., 2013). Results showed that mindfulness was the mechanism of change for the improvements in mental health, and effect sizes were moderate. However, MBIs were not more effective than traditional cognitive behaviour therapy (CBT) and other behavioural interventions (Khoury et al., 2013). Similarly, in an extensive review by Zhang and colleagues on the impact of MBIs on physical, mental, and social-related pathologies, the evidence presented improvements in depression, anxiety, stress, cancer-related pain and psychological symptoms, as well as in addiction, weight control, and prosocial behaviour (Zhang et al., 2021).

Behavioural interventions started to add components of mindfulness to their interventions in the wake of Jon Kabat-Zinn's MBSR which he began to implement in North America in 1979. Kabat-Zinn adapted mindfulness and meditation practices from Buddhist traditions in the East for a Western and secular audience (Baer, 2003; Kabat-Zinn, 2003; Shapiro et al., 2008). MBSR is an 8-week program originally designed to alleviate suffering for those living with chronic pain. Within its practices, the breath is used as an anchor for the mind to train attention and awareness and to re-orient the mind away from the pain to

present-moment experience, in which one can observe ones' bodily sensations with non-judgement, curiosity, openness, and acceptance (Kabat-Zinn, 2003). In addition to being successful in reducing their perception of pain, additional benefits emerged to do with increased IAW, self-regulation, cognitive defusion, meta-awareness, psychological well-being, and improved quality of life (Baer, 2003; Davidson & McEwen, 2012; Kabat-Zinn, 2003; Shapiro et al., 2008; Tang et al., 2015) all of which are required for RH.

Based on these results, established behavioural change interventions began to add components of mindfulness to their existing interventions to encourage intrapersonal attunement and ER. This inducted a 'third wave' of novel interventions known as MBIs (Querstret et al., 2020; Rosenkranz et al., 2019; Vollestad et al., 2012; Zhang et al., 2021). MBCT was the first to emerge from MBSR and subsequently DBT, Mindfulness-Based Relapse Prevention (MBRP), and ACT, among others (Hayes et al., 2012; Querstret et al., 2020; Rosenkranz et al., 2019; Vollestad et al., 2012). Like the component of mindfulness, acting entrains both IAW and a meta-awareness of reactivity (Brook, 1988, 1996; Moore, 1984; Newlove, 1993; Stanislavski, 2013a). For the most part, the actor is required to embed the reactivity rather than regulate it, as one is required to do in mindfulness training. The actor must consciously fuse with thoughts, emotions and sensations, rather than defuse, monitor and modify them for regulation. The actor's job is to portray the maladaptive and healthy aspects of being human and to illustrate the complexity of character and relationship dynamics (Stanislavski, 2013b). Furthermore, 'mindfulness' is defined within actor training as 'presence' and forms an essential component of developing the instrument of the actor both for character development and for performance (Brook, 1996; Donnellan, 2005; Levin, 2006)

As MBIs developed intrapersonal attunement, participants' interpersonal engagement improved through inhibiting maladaptive response tendencies, feelings of connection, increased empathy and compassion (Himmelstein et al., 2015; Petersen & la Cour, 2016; Valk et al., 2017). MBIs provide evidence which supports improvements in intra-personal and interpersonal RH (Bockler et al., 2017; oury et al., 2015; Querstret et al., 2020; Valk et al., 2017). These interventions have been shown to improve intra-personal health regarding social anxiety, generalized anxiety, substance abuse, depression, chronic pain, and burnout (Agarwal et al., 2015; Cohen-Katz et al., 2005; Gregg et al., 2007; Himmelstein et al., 2015; Hjeltne et al., 2017; Keyworth et al., 2014; Petersen & la Cour, 2016; Reid et al., 2014; Tsang et al., 2015; Vollestad et al., 2012; Witkiewitz et al., 2013; Zgierska et al., 2016), and interpersonal health concerning

empathy and compassion (Dev et al., 2018; Hofmann et al., 2011; Jain & Fonagy, 2018; Neff & Germer, 2017).

In an outpatient pain clinic in Denmark, 87% of the participants rated an MBSR intervention positively, with 77% continuing to use mindfulness techniques frequently in their lives. Patients cited a positive outlook and feelings of connection with others as significant outcomes (Petersen & la Cour, 2016). In a different population, Himmelstein et al. (2015) conducted a pilot study with incarcerated youths in which they received mindfulness meditation training over 10-15 weeks within their therapy sessions versus a group who received only therapy sessions. Participants reported significant improvement in their ability to sleep, self-regulate, be self-aware, and have the power to inhibit impulsive decisions in favour of more positive actions that did not impact negatively on their self-image and life consequences (Himmelstein et al., 2015). Then, Take-A-Breath, an MBI which targets reducing parental distress, where parents are coping with their child's critical and life-threatening illness, parents were able to attune to, accept and regulate their feelings and, in turn, replenish their emotional reserves more quickly (Burke et al., 2014). These diverse contexts show the beneficial impact of MBIs in improving positive affect and reducing stress.

MBIs are increasingly used in the workplace to reduce stress and improve job satisfaction (Bond & Bunce, 2000; Flaxman & Bond, 2010). Long and Christian (2015b) hypothesised that mindfulness will reduce reactivity between employees, both concerning self-esteem and rumination, when there is unfair treatment, thereby inhibiting retaliatory behaviour. In their study, in addition to exhibiting more rumination and negative emotion following the unfair treatment by a supervisor, the control group retaliated with theft of pens left on their desks that they were asked to leave behind as well as more harsh feedback on their performance review survey of their supervisor's capability, significantly more than the mindfulness group. This intervention illustrates the direct impact of MBIs on RH.

More recently, interventions that target socio-affective and socio-cognitive capacities, such as compassion and empathy and perspective-taking respectively, are showing effectiveness in activating prosocial behaviour (Böckler et al., 2016; Bornemann et al., 2016; Leiberger et al., 2011; Verdejo García et al., 2011), positive affect (Klimecki et al., 2012; Klimecki et al., 2014; Pace et al., 2009), and social connectedness (Henje Blom et al., 2016; Kok & Singer, 2017; Singer & Engert, 2018; Tuschke et al., 2016; Valk et al., 2017). In the longitudinal study, The Resource Project (Singer et al., 2016), comprising nine months of

three modules of three months each on presence, affect and perspective-taking respectively (Valk et al, 2017). In the latter module participants practiced a daily perspective-taking exercise, connecting with their internal state and inferring their partner's mental state. Results showed that participants with a greater capacity to connect with their own thoughts and emotions were able to better understand the mental state of others (Böckler et al, 2017). In this same study brain morphology and brain regions activated corresponded to perspective-taking or empathy structures versus compassion structures in the two distinct perspective-taking and compassion modules (Valk et al, 2017). Despite this positive evidence, there is still a scarcity of intervention that target interpersonal relationships, specifically interventions that develop perspective-taking and directly target stressful relationships. Generating compassion is more common within MBIs through Loving Kindness Meditation (LKM), compassion or self-compassion processes.

'Interpersonal Mindfulness' (Khoury et al, 2022; Pratscher et al, 2019) is a relatively new construct within MBIs and is gaining momentum within MBI research to measure the impact of mindfulness on the interpersonal space and relational wellbeing. Pratscher et al, 2018 found that the quality of interpersonal mindfulness directly related to friendship quality. Moreover, dispositional mindfulness correlated with interpersonal mindfulness. Conversely, co-rumination within a close friendship meant that anxiety and depression increased (Pratscher et al, 2018).

The socio-affective LKM and compassion practices have been found to increase social connectedness and prosocial behaviour when used within MBIs (Hoffman et al, 2011). Empathy and compassion are distinct constructs. The former is a socio-cognitive process involving perspective-taking to attempt to understand and resonate with the inner world of another, also known as Theory of Mind (TOM), where compassion is an affect process in which loving and kind feelings for the self and other are practiced (Singer and Klimecki, 2014; Valk et al., 2017). Empathy is a top-down process initiated through perspective-taking and inference processes, where compassion is a bottom-up process generated through exercises in which one practices feelings of benevolence towards the self and others (Valk et al, 2017). Klimecki and colleagues conducted a study to investigate the impact of short-term compassion training on neural activation when witnessing video clips of people in distress (Klimecki et al., 2012; Klimecki et al., 2014). Additionally, the researchers sought to disentangle the neural substrates involved in empathy versus compassion. First, participants

underwent empathy training and were compared to a memory task control group pre- and post-viewing video clips of people suffering. Results showed that short-term empathy training activated neural regions that overlapped with areas involved with empathy for pain and increased negative affect (Klimecki et al., 2014). Too much exposure to suffering has been shown to lead to empathic distress and empathic fatigue, leading to burnout (Aeschbach et al., 2021; Dev et al., 2018; Lomas et al., 2018). Subsequently, the participants were exposed to a different set of videos of people experiencing distress (both before and after a short compassion training) compared to a memory group. The fMRI results showed short-term compassion training developed neural networks associated with maternal care, increased positive affect, and reduced negative affect (Klimecki et al., 2013), substantiating research on the different neural mechanisms involved in empathy and compassion (Klimecki et al., 2014; Singer & Klimecki, 2014). Research on compassion training has verified that compassion can serve as a buffer when witnessing others in distress and activate prosocial behaviour (Hofmann et al., 2011; Leiberg et al., 2011; Valk et al., 2017; Verdejo García et al., 2011).

Research shows that where compassion activates prosocial behaviour, characterised by the motivation to help, empathy can overwhelm and increase negative affect and prompt withdrawal from others (Singer & Klimecki, 2014). In addition, compassion has been shown to uphold a psychological buffer to psychosocial stress, improving neuroendocrine and immune responses (Hoffman et al., 2012; Neff & Germer, 2017; Pace et al., 2009). Distinct networks have been identified for training empathy and compassion. Empathy activates the AIC and the ACC, areas which overlap with the training of interoception and first-person experience (Singer & Klimecki, 2014; Singer & Lamm, 2009; Singer et al., 2004). These overlapping neural networks for interoception and empathy might explain the endemic empathy fatigue and burnout within healthcare professionals. Compassion, on the other hand, strengthens deeper areas within the brainstem, such as the ventral tegmentum and substantia nigra, involved in activating the care network or ‘motherly instinct’ (Singer & Engert, 2018; Valk et al., 2017; Verdejo García et al., 2011).

A potential omission within the setup of MBI studies is the exploration of participants’ significant other’s experience of changes in their interpersonal engagement once their partner has completed an intervention. Aside from the The ReSource Project (Singer et al., 2016), a highly funded and resourced project, to my knowledge, I do not know other studies that have interviewed partners of those involved in an MBI. It might offer additional

useful data to the social benefit of these interventions. However this data does emerge through questioning within qualitative interviews. In an MBI tailored for physicians for wellbeing, participants spoke about the impact it had on their social interactions, both at home in their personal lives and at work (Aeschbach et al, 2021). Rabie et al, 2022 implemented an intervention for care workers in a low-income setting that included empathic training and self-care as focus points. Participants shared their experience of the turnaround in their supervisors communication skills and attitude towards them, which in turn generated feelings of mutual respect and being cared for, in an otherwise relentless and challenging setting. Studies chosen within the MBI literature extend from clinical to non-clinical populations and include the work environment to emphasise the reduction in reactivity after having undergone an MBI. Compassion interventions form part of some MBIs and target feelings of benevolence to others, and are the well-researched within MBI literature, however there is a paucity of studies that directly target RH through dyadic exercises for perspective-taking, empathy and improve RH.

Within neuroscience in education research, it is emerging that there are distinct networks involved in different types of learning, thus executive function and social-emotional learning require different kinds of training and application (Immordino-Yang et al., 2019), indicating the imperative need to update our education system with the rise of mental health disorders in young people (Immordino-Yang et al, 2019). Embodied attunement to physical and sensory sensations, emotions and mental activity is a central construct within MBIs (Khoury et al., 2013; Zhang et al., 2021). In addition, dyads are central to socio-affective and socio-cognitive programmes, enabling real-world context social learning (Bockler et al., 2017; Kok & Singer, 2017; Singer & Engert, 2018; Valk et al., 2017) and promoting dyadic regulation (Kok & Singer, 2017) .

2.4.2 Theatre pedagogy as a mental training programme for IAW

In a similar vein, theatre practice is an embodied pedagogy that entrains attunement to the interplay of the body-brain-environment in a three-way dynamical system (Brook, 2017; Newlove, 1993; Schechner & Wylam, 2013). In addition, theatre is integrally relational, both in its pedagogics and in its implementation (Moore, 1984; Stanislavski, 2013a). Theatre pedagogy entrains awareness of the internal milieu of the actor and the character, respectively, through becoming aware of the sensations, mental activity and emotions of their internal landscape versus the characters and their associated behaviours (Moore, 1984;

Stanislavski, 2012, 2013a, 2013b). This training is extended to identify how internal sensations, mental activity, and emotions change in response to different relationships (Malgram, 1993-1996; Moore, 1984; Newlove, 1993; Stanislavski, 2013a). Character development in actor training relies on IAw and sensory awareness training and utilises present-moment attention as the instrument of instruction (Brook, 1988, 1996; Schechner & Wylam, 2013). Presence is an essential tool of the actor to remain connected and responsive to how external and relational environmental cues activate the character's inner life and thus their behaviour (Barba & Grotowski, 1999; Brook, 1996, 2017, 2018; Lecoq & McBurney, 2002; Marowitz, 1986; Moffitt, 1999; Schechner & Wylam, 2013). Awareness of one's internal world is deeply cultivated in character work so that the actor can embed the thoughts, motivations, emotions, memories, and perspectives of the character, together with the internal physiological sensations and breathing patterns that initiate the character's behaviour repertoire (Hilton, 1990; Newlove, 1993; Stanislavski, 2012, 2013a, 2013b). The actor must consciously fuse with thoughts, emotions, and sensations, rather than defuse, monitor and modify them for regulation. The actor's job is to portray the maladaptive and healthy aspects of being human and to illustrate the complexity of character and relationship dynamics.

Moreover, actors are trained to carry a meta-awareness of their inner world versus that of the characters (Brook, 2017; Hilton, 1990; Stanislavski, 2013a). Consequently, the actor aims not to impose their own perspective paradigm onto the character. In the development phase, the actor is trained not to judge the character, but rather to observe their behaviour and find meaning within it, so that they can embody it wholly, without judgement. Moreover, within the performance phase, the actor works with a dual focus – activating the prompts that have been chosen to ignite the inner life and outer behaviour of the character and respond to what is playing out on stage. This dual focus embeds the necessary meta-awareness, which prevents an actor from losing the distinction between real life and performance. This author posits that theatre training, an embodied pedagogy, might entrain somatosensory and socio-cognitive capacities for IAw. Research in the area of socio-cognitive capacities of actor training is in its infancy and has shown the development of empathy (McDonald et al., 2020). Somatosensory evidence is emerging through using improvisation techniques in the realm of business to develop psychological adaptableness (Schwenke et al., 2020) and ER in children (Goldstein & Lerner, 2018).

2.4.3 The use of visualisation in MBIs and theatre pedagogy

Imagery is often incorporated in behavioural interventions (Menzies et al., 2006), to promote regulation and improve RH (Jain & Fonagy, 2018). Within this context, imagery includes visualisations or mentalisations (Jain & Fonagy, 2018), prompted and developed internally in the imagination to produce effects of relaxation and psychological well-being (Menzies et al., 2006; Roffe et al., 2005). Visualisations might involve mental images, such as a beautiful nature scene, imagining oneself in a healthier light, or visualising oneself attaining a specific goal (Menzies et al., 2006; Roffe et al., 2005; Trakhtenberg, 2008). In clinical settings, guided imagery serves to stimulate changes in psychophysiology for improvement in symptoms such as depression, anxiety, and self-efficacy (Menzies et al., 2006; Roffe et al., 2005). In theatre pedagogy, visualisation forms a key component of character development. Visualisation is used to prompt sensory and emotional physiological arousal within the actor while building and developing a character (Moore, 1984; Stanislavski, 2013a). These mental prompts, drawn from the actor's imagination or past lived experience, are gathered over the rehearsal process and plotted into an invisible internal map that is drawn on in performance to prompt the desired behavioural effect. Changes in breath placement and rhythm are used to activate different emotions and psychological behaviours (Donnellan, 2005; Malgram, 1993-1996; Newlove, 1993; Rodenburg, 2009, 2015a; Stanislavski, 2013a), for example, an anxious character might breathe from the upper chest in a rapid manner.

An MBI is a reliable mechanism within which to incorporate theatre pedagogy to improve RH. Experiential exercises that incorporate visualisation for IAW are central to these interventions, together with discussions in dyads and groups. The author suggests that induction of IAW can be achieved through adapted character development exercises from theatre pedagogy. Character development in actor training relies on IAW training and utilises mindfulness or presence, as it is referred to in the theatre, as the instrument of instruction for interoception. These processes enable insight into what formulates perspectives, relational patterns and causes of emotional arousal. The exercises are embodied and experiential and strongly engage the body-brain system. Moreover, breathing exercises form a key component of these interventions. Breathing is a central component of theatre pedagogy, both in the technical work for voice projection (Consolo et al., 2008) and character development (Donnellan, 2005; Malgram, 1993, 1996; Newlove, 1993; Rodenburg, 2009, 2015a). The

former uses diaphragmatically breathing, which is known to promote ER (Consolo et al., 2008).

The present study aims to directly develop IAw through adapted character development exercises from theatre pedagogy, and ER through the GNLBE, to improve RH in the context of stressful relationships. There is a gap within MBIs that specifically target RH in the context of stressful relationships with significant others. The TBRH intervention explicitly addresses RH through developing IAw, and ER within the context of stressful relationships. Additionally, the TBRH incorporates adapted character development processes from theatre pedagogy to develop IAw within the context of the relational paradigm. Theatre pedagogy, an embodied relational paradigm, and situated within a MBI framework, targets IAw and perspective-taking for the purpose of improving RH further contributes to the gap in MBIs.

This study investigated whether the TBRH intervention effects change pre-to post-intervention in IAw, ER and RH.

2.5 Summary

This chapter reviewed the pertinent literature in the fields of interoception and ER. An overview of MBIs was established, and theatre pedagogy was presented, highlighting the relational and embodied nature of actor training and its potential implications for developing IAw within a TBRH intervention. Breathing was introduced as an ER strategy. Social adaptation reflected in HRV measures and current literature on MBIs emphasises the need for novel interventions to develop IAw and ER, specifically to improve RH within stressful relationships. The following chapter details the methodologies used within this study.

Chapter 3

METHODOLOGY

The purpose of this chapter is to provide a detailed outline of the methods employed in this study. The chapter provides an overview of the study design, procedures, intervention implementation, data collection, data analysis, and ethical considerations.

3.1 Study design

This study used a mixed-methods design with quantitative and qualitative measures to assess neurobiological, behavioural, and self-report changes before and after a TBRH intervention. Triangulation of methodologies was chosen to increase the reliability and understanding of the impact of the novel intervention. IAw, ER, and RH were measured quantitatively pre- and post-intervention. Behavioural questionnaires and scales were used to evaluate changes in IAw and ER pre- and post-intervention, as well as an additional measure for state-trait anxiety. HRV measures were calculated from the changes in the IBI between heartbeats pre- versus post-intervention to index the changes in the ANS activations of the heart associated with changes in ER. The qualitative method used semi—structured interviews post-intervention to understand how the participants experienced the TBRH intervention and whether they experienced changes in their relational health before and after the intervention.

There were two studies conducted. Study 1 was a pilot study to assess the feasibility and acceptability of the TBRH intervention, and to measure preliminary efficacy. Study 1 utilised a mixed-methods pre-post design to pilot the intervention (See Figure 1). Study 2, the main study, evaluated the evidence for changes in IAw, ER, and RH before and after the TBRH intervention. Study 2 employed a mixed methods waitlist-control design with two groups (Groups A and B) to test the full TBRH intervention. Group A refers to the intervention group, and Group B refers to the waitlist-control group (see Figure 2). A third group (Group C) was recruited as a retest group who received the breathing-only intervention, which is a core exercise within the full TBRH intervention. This was to separate the effects of the breathing intervention from the full TBRH intervention (See Figure 3).

Figure 1

Diagrammatic representation of pilot study, number of participants and measurements with timing.

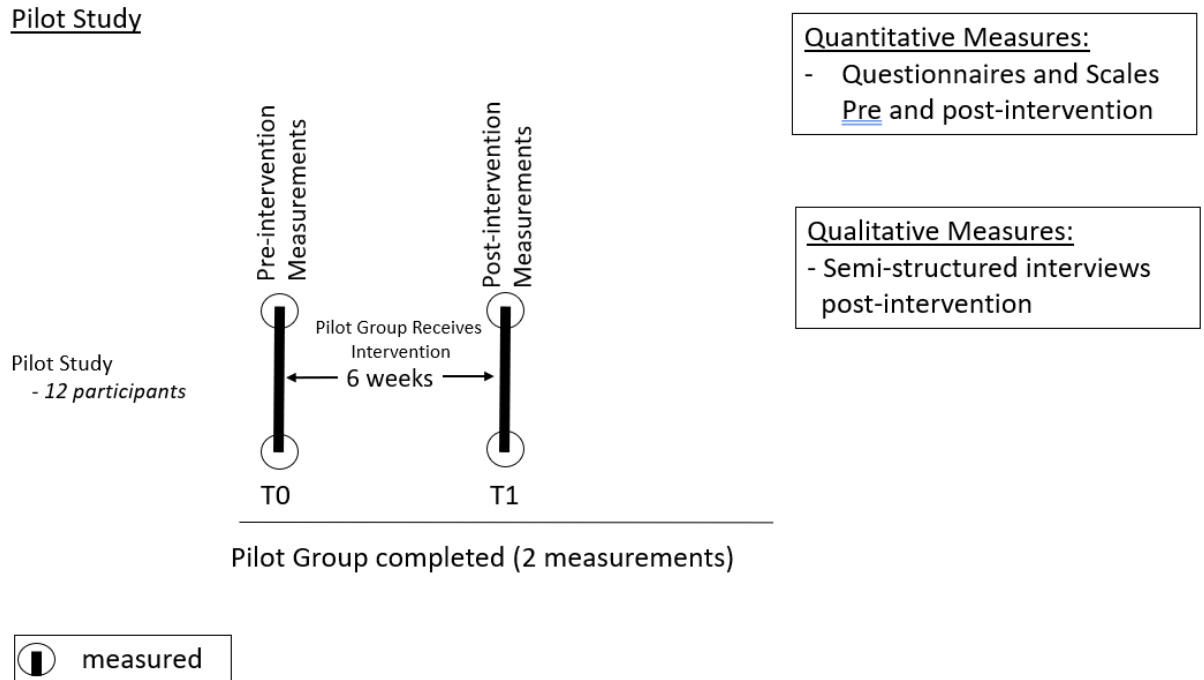


Figure 2

Diagrammatic representation of waitlist design with number of participants, groups and measurements with timing.

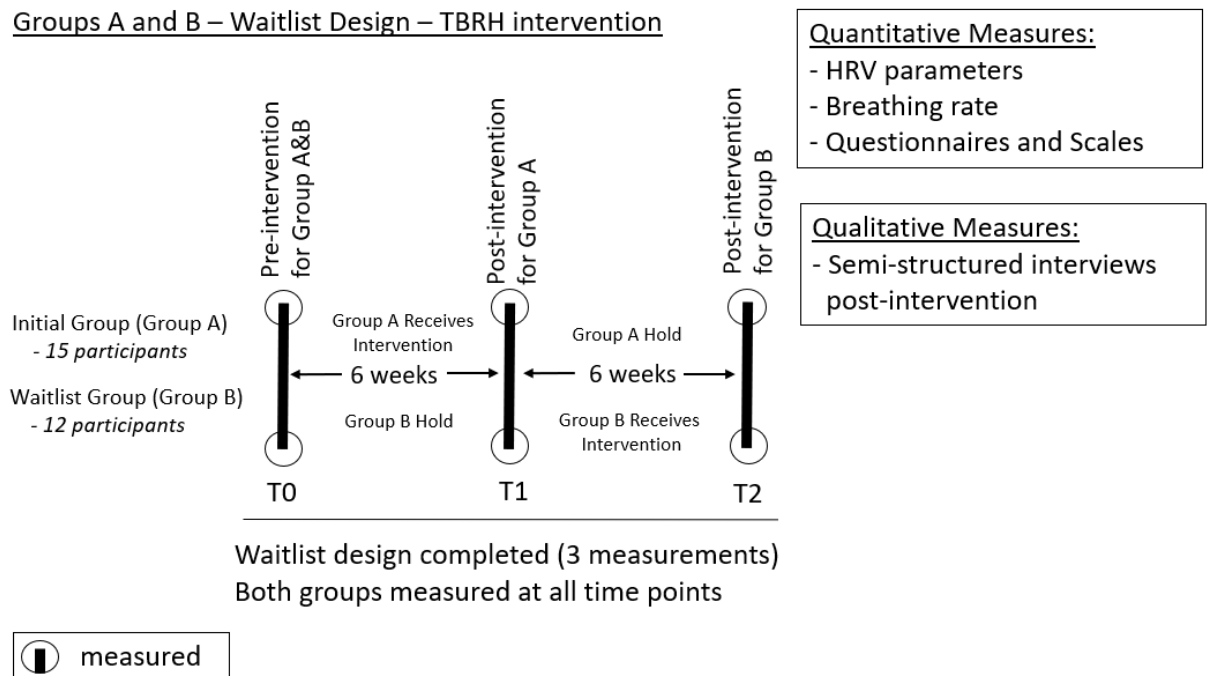
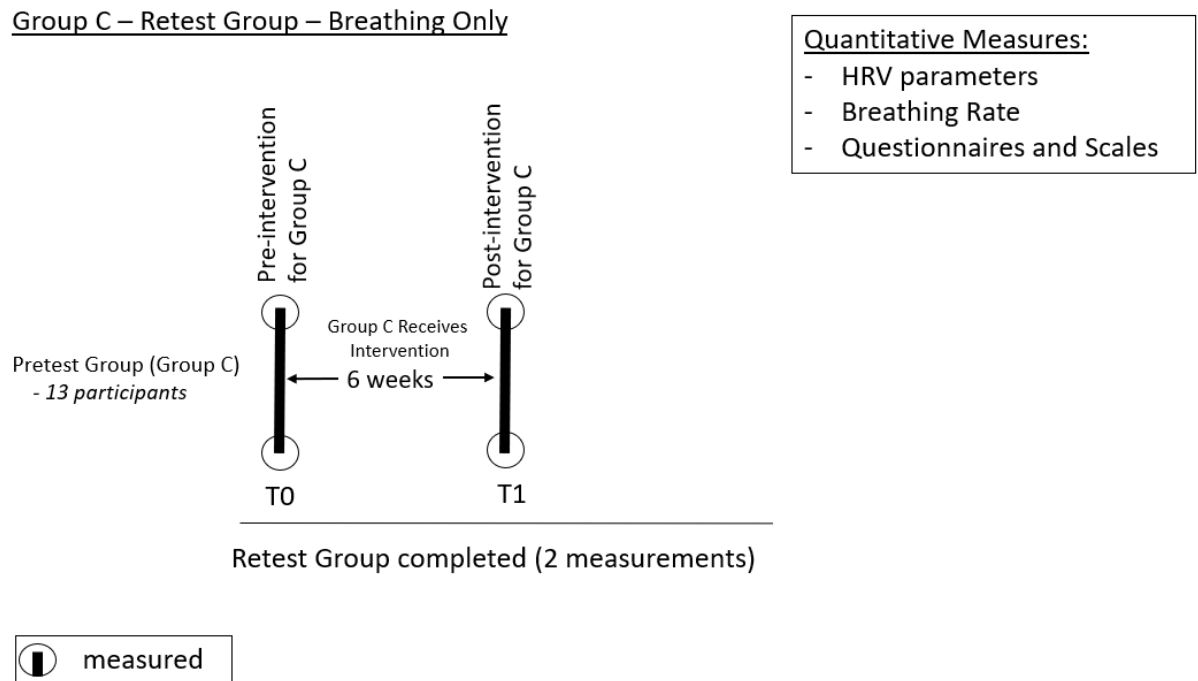


Figure 3

Diagrammatic representation of the retest group with measurement time points. The retest group for the breathing intervention only, the GNLBE, which is a core component of the TBRH intervention.



3.2 Study 1: The Pilot Study (HREC Ref: 068/2019)

The primary aim of this pilot study was to determine the feasibility and acceptability of the TBRH intervention. Semi-structured interviews were conducted post-intervention in order to understand the preliminary effectiveness of the TBRH intervention with regard to the core constructs of self-awareness, emotion regulation, and relational health. Moreover, quantitative behavioural questionnaires and scales were administered before and after the TBRH intervention to measure changes in IAw and ER.

3.2.1 Participants, Sampling and Enrolment

Fourteen adults between the ages of 25 and 60 were recruited from the general public to participate in the pilot study. Participants were recruited via advertisements sent to corporate and other professionals via LinkedIn, Facebook, and WhatsApp groups, as well as to school parent body networks (Appendix A). Two screenings were conducted before study enrolment. First, participants were excluded from participating in the study if they were outside the 25 - 60 years age range, if they were on prescribed medication to treat chronic health conditions, or if they participated in regular breathing or embodied practises in the last

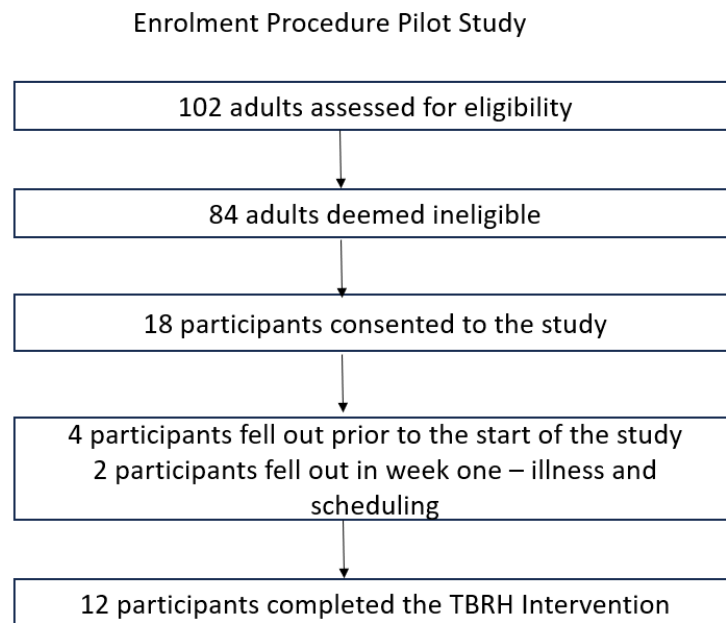
year, including meditation, yoga, or daily reflective journaling. Participants had to be fluent in English, owing to the intervention being facilitated in English. Race, gender, religion, or culture were not stipulated. After the initial exclusion process, participants were invited to an in-person information session. During this session, participants completed the Abbreviated Post Traumatic Stress Disorder Checklist – Civilian version (PCL-C; Weathers et al., 1993), and a score greater than 14 led to further exclusion (Appendix B). Participants who scored above 14 on the PCL-C were informed of their exclusion via email and provided with the contact details of an HPCSA registered Clinical Psychologist whom they could contact should they experience psychological distress.

The in-person information session was held to introduce the potential participants to an overview of the content, format, and structure of the TBRH intervention. Additionally, information was shared about the time commitment, confidentiality, group format, and practical elements of time and venue. Moreover, participants were taken through mental health considerations to assess for themselves whether they were suited to the intervention at this time in their lives. Brown University's 'Clinical and Affective Neuroscience Laboratory' dispense a '[Meditation Safety Kit](#)' comprising tools, screening measures, and guidelines to conduct MBIs in a safe manner (. The Bangor Assessment and Orientation Guidelines were used to guide the information session (Appendix C). Participants read the Participant Information Sheet and signed the consent form (Appendix D).

One hundred and two adults were approached for this pilot study, and 84 were deemed ineligible due to a range of factors, including, medication, PTSD, existing breathing practices, age, scheduling, being in a different city and being known to the facilitator. Four participants dropped out prior to the start of the process owing to changes in their scheduling and time constraints. Fourteen participants enrolled to start the study. Two participants fell out at the end of week one owing to illness and scheduling, respectively. Twelve participants ($n = 12$) completed the TBRH intervention. Please refer to Figure 4 for the pilot enrolment procedure.

Figure 4

Diagrammatic representation of the enrolment procedure for the Pilot Study



3.3 Procedures

Participants completed four questionnaires at two timepoints, on Lime Survey, a University of Cape Town password-protected survey platform, one week before participating in the TBRH intervention and up to one week after the TBRH intervention. Participants took part in the TBRH intervention once a week for six weeks for two hours. The intervention was offered in the evenings from 6 p.m. to 8 p.m., at the Faculty of Health Science Campus, in a private and sound-attenuated room with closed doors and curtains.

3.4 Measures

3.4.1 Quantitative Measures

Questionnaires were completed by pilot participants at two time points, pre- and post-receiving the intervention. This measured IAw, ER, mindfulness, and self-compassion (see below and Appendices E, F, and G, respectively). In addition to the direct measures to assess the intervention, an anxiety measure was included to determine whether the intervention affected subjective anxiety (Appendix H).

3.4.1.1 Multidimensional Assessment of Interoceptive Awareness (MAIA-2)

The MAIA-2 is a 37-item self-report questionnaire designed to measure multiple elements of IAw on a 6-point Likert scale (0 = Never to 5 = Always). The MAIA-2 replaced

the original MAIA published in 2012, which revealed low internal consistency for two of its eight subscales (Mehling et al., 2018). The MAIA was developed for mind-body therapies and MBIs to distinguish between healthy and maladaptive IAW (Mehling et al., 2012; Farb and Mehling, 2016). The MAIA-2 comprises eight subscales: Noticing, Not Distracting, Not Worrying, Attention Regulation, Emotional Awareness, Self-Regulation, Body Listening, and Trusting (Mehling et al., 2018). These subscales combined measure both the ability to become aware of internal bodily sensations as well as the ability to evaluate and regulate the emotional and cognitive components of these sensations (Mehling et al., 2017, 2018). For example, the subscale Emotional Awareness measures ‘awareness of the connection between body sensations and emotional states’, and the subscale Self-Regulation measures the ‘ability to regulate distress by attention to body sensations’ (Mehling et al., 2018). The MAIA-2 demonstrates sufficient inter-reliability and consistency within diverse settings and cross-populations (Mehling et al., 2017). To the author’s knowledge, the MAIA-2 has not been used in South Africa. However, it has been used on similar populations (Singer and Kok, 2016). The eight scales have been shown to have adequate to excellent internal consistency reliabilities, with Cronbach’s alphas from $\alpha = 0.64$ to $\alpha = 0.83$ and above $\alpha = 0.70$ for five of the eight scales (Mehling et al., 2018).

3.4.1.2 Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2008)

The FFMQ is a 39-item self-report questionnaire that measures five distinct aspects of mindfulness on a 5-point Likert scale ranging from 1-5 (1 = Never to 5 = Always true). The FFMQ comprises five subscales that measure separate elements of mindfulness, from interoception to meta-awareness to self-regulation capacities (Hjeltne et al., 2017; Singer et al., 2016; Taylor & Millier, 2016). The five categories are Observing, Describing, Acting with Awareness, Non-Judging of Inner Experience, and Non-Reactivity to Inner Experience (Baer et al., 2008). The FFMQ shows good internal consistency (alpha coefficients range from $\alpha = .72$ to $\alpha = .92$) in diverse populations (Baer et al., 2008). Importantly, the FFMQ has been used successfully with South African populations (Arthur et al., 2018; McIntyre et al., 2017).

3.4.1.3 Self-Compassion Scale (SCS)

The SCS is a 26-item self-report measure that is scored on a 5-point Likert, ranging from 1 (Almost never) to 5 (Almost always). An increase in the positive subscales and a decrease in the negative scales indicates an increase in the individual facets of self-

compassion (Neff, 2003). The SCS comprises six sub-scales that evaluate three pairs of opposites within the concept of self-compassion: self-kindness versus self-judgement, common humanity versus isolation, and mindfulness versus over-identification (Neff, 2003). Self-compassion is comprised of three elements: kindness to the self in the event of failures, understanding one's disappointments and mistakes in the context of common humanity, and mindful awareness of one's thoughts and emotions (Braehler & Neff, 2020; Neff, 2023). Self-compassion encompasses an acceptance of one's imperfections and mistakes and views these in the larger context of the human condition (Dev et al., 2018; Neff, 2003; Neff, 2023; Neff & Germer, 2013). The SCS has good construct validity with an internal consistency of $\alpha = .92$. It demonstrates sufficient test-retest reliability with an overall $\alpha = .93$. The SCS is positively correlated with good mental health and negatively correlated with anxiety and depression (Neff, 2003, 2016b).

3.4.1.4 The State-Trait Anxiety Inventory for Adults (STAI)

The STAI is a 40-item self-report questionnaire that measures both state and trait anxiety on a 4-point Likert scale ranging from 1 (Very Much So) to 4 (Not At All) (Spielberger et al., 1970). The measure is widely used in non-clinical populations (Spielberger et al., 1970). The STAI comprises 20 items that measure state anxiety (STAI-S) and 20 items that measure trait anxiety (STAI-T). Higher scores on the STAI indicate higher levels of anxiety. The STAI has been widely used in different populations (Barnes et al., 2002; Godara et al., 2021; Howarth et al., 2019), including South African populations (Prinsloo et al., 2013b). Despite continued wide usage of the scales, further analysis shows that the STAI-T measures general negative affect, including depression and anxiety, rather than anxiety only (Knowles & Olatunji, 2021).

3.5. The Theatre-Based Relational Health Intervention

The TBRH is a six-week intervention designed to develop IAw of one's emotional triggers in stressful relationships with significant others and to learn to manage one's emotions and thoughts with self-awareness using a breathing tool, the GNLBE. The goal is to improve relational health, i.e., one's relationship with oneself and one's relationship with others. The TBRH intervention combines adapted exercises emerging from theatre pedagogy which includes adapted character development exercises and embodied awareness processes to develop IAw. A breathing intervention called GNLBE is taught to develop ER, specifically for RH.

The exercises for IAw address different parts of self in and out of balance and what stresses, overwhelms, and soothes these parts. A guided embodied awareness exercise gives insight into the felt experience of three early caregivers, their physiological, emotional and mental manifestation and their impact on current relational dynamics. Participants have an imagined real-world stressful conversation before and after using the GNLBE to experience the changes in listening and communication. Participants' core emotional triggers are identified from this exercise. Participants role play real life scenarios in which they practice being triggered and interrupting their trigger with the GNLBE, to move through the stressful encounter in a more regulated and healthier way. Importantly, participants guide their partners in the role play in details of their facial gestures, vocal tone, and body orientation, and in so doing, participants become aware of the components that trigger them.

The GNLBE comprises gentle activation of the breath in the belt area and works with listening to internal sensations within this area, filling or nourishing this area with breath and using spontaneous colour visualisation to activate the PNS. Participants are instructed to fill or nourish their belt area with breath while simultaneously listening to internal sensations. Next participants are guided to allow a colour to enter their mind's eye and if it does to fill their belt area with both the colour and the breath. Located in the mindfulness breathing tradition this exercise activates parasympathetic regulation through breath placement and colour visualization to promotes compassionate listening to the self and other.

Each week begins and ends with participant feedback. At the start, participants provide feedback on their experience of practising the GNLBE and any issues they might be having with the exercise. Participants are asked to practice the GNLBE daily for one to four minutes, at a time convenient to their routine. In addition, they feedback their response to the homework tasks they've been given. The session ends with feedback on the session's exercise and the GNLBE. From week two, participants are asked to do a self-care exercise unique to them and drawn from week two's exercise 'Character Analysis 1'. Homework is both targeted individually and collectively and involves holding the lessons' learnings in the participants' consciousness throughout the week and noticing any additional and useful observations and insights. Please see Table 3.1 for a week-by-week overview of the intervention and refer to Appendix I for the full intervention.

Table 3.1

Overview of the six-week Theatre-Based Relational Health Intervention

Week	Overview of Session
1	Psychoeducational talk on the neuroscience behind why relationships are challenging, the development of the ANS and consequently relational homeostasis is discussed. The Golden Nugget Listening Breathing Exercise (GNLBE) is taught.
2	‘Character Analysis 1’ is a visual and tactile process to gain insight into different parts of self and what stresses and soothes these different parts. The GNLBE is practiced.
3	‘Relationship Triggers & Patterning’ exercise - participants are guided to explore a felt experience of three early care-giver relationships that might have modelled current relational reactivity cues. The physiology, emotions and thinking patterns associated within each care-giver dynamic are identified. The GNLBE is practiced. ‘The Biography Worksheet’ is given as homework. It is a sheet of questions that probe the familial, religious, cultural, political, socio-economic and sensory environment participants grew up in, to gain insight into what contributes to informing their perspective lens. In addition, questions to extend the information gained through the ‘Relationship Triggers & Patterning’ reflection questions are given for consideration.
4	Participants experience having a stressful conversation when they feel safe versus when they feel threatened using an imagined real-world stressful relationship. From this conversation participants identify their unique core trigger. For example, ‘I need approval’, ‘I am not seen’, ‘I am stupid’. The GNLBE is practiced.
5	‘Role Play’ – participants role-play a real-world stressful relational scenario and practice interrupting being triggered using the GNLBE. They instruct their partner in facial gesture, vocal tone and body orientation. The GNLBE is practiced.
6	The program is recapped, and any outstanding links are made, forward intentions are committed to with suggestions as to helpful structures and remaining questions are answered. The GNLBE is practiced.

3.6 The Golden Nugget Listening/Breathing exercise (GNLBE).

Participants are guided through this breathing exercise in stages. They are guided to place their feet hip width apart directly under their shoulders. They are instructed to take three deep and slow breaths and gently bring themselves into the room and into their body. Participants are orientated to the ‘core’ area of the pelvis, the ‘belt’ area, known as the ‘tan tien’ in traditional Chinese medicine. This is found by placing four fingers horizontally below the naval. Where the 4th and baby finger lie is where the entire hand should be placed to gently activate the area with touch. They are instructed to gently activate and fill this area of the body with breath. They are asked to notice whether the sensations within this area are resistant, sluggish, tight, pulling, pricking, aching or soft, expansive and yielding. Participants are guided to place their mind’s eye into this area and activate it with breath, while simultaneously listening to the internal sensations in this area. After a 1-2 minutes participants are asked to allow a colour to emerge in their minds’ eye. If a colour emerges, they are asked to fill this area with the colour and breath. If no colour emerges, they are instructed to continue just with the breath alone. For many the addition of the visualization of colour enhances an embodied activation of this ‘core’ area in line with psychophysiological changes that are activated with visualization of different kinds (Menzies et al, 2013).

3.7 Facilitator

The PhD candidate developed the TBRH intervention in 2016 and The Golden Nugget Listening/Breathing Exercise in 2002. The full TBRH intervention and the GNLBE were logged with the University of Cape Town’s Research Contracts & Innovation Office (Ref: Barnard/Bailey) on 14th November 2018 (Appendices J and K). The PhD candidate facilitated the programme to safeguard content precision owing to a lack of trained facilitators in this methodology.

3.8 Qualitative Measures – Pilot Study - Semi-structured Interviews

The pilot study interviews aimed to assess the feasibility and acceptability of the intervention, as well as participants’ experience of the TBRH intervention and its impact on their self-awareness, ER, and RH. The semi-structured interview comprised 30 open-ended questions: 16 questions pertained to feasibility and acceptability, and 14 questions investigated whether the exercises within the intervention were effective for the aims of TBRH (Appendix L). The interviews were conducted in person in a sound-attenuated room in the library at the Faculty of Health Sciences, UCT. They were conducted by an external researcher.

3.9 Data Analysis

3.9.1 Questionnaires

Cronbach alphas reliability tests were run for all questionnaires and subscales. We interpreted the data using $\alpha > 0.60$ as acceptable internal reliability. The computerised answers were captured on an MS Excel spreadsheet and aggregated. Quantitative analyses were performed using Statistica version 13.5. Shapiro Wilks was used to determine data distribution for each variable. Normally distributed data underwent parametric dependent t-tests, while non-normally distributed data underwent non-parametric Wilcoxon-matched pairs tests. Data are reported as mean (M) with standard deviation (SD) and median (Med) with range, test result and significance are reported for p -values < 0.05 .

3.9.2 Qualitative Analysis

Study 1 used a realist Thematic Analysis with an *a priori* coding scheme. We looked for findings from the TBRH intervention for the three core constructs of the intervention, namely IAw, ER, and RH.

Establishing the feasibility and acceptability of the intervention enabled progression to Study 2. The main study permitted the addition of a neurobiological measure, HRV, in a waitlist-control group design and the addition of a retest control group, who received the GNLBE-only for six weeks.

3.10 Study 2: The Main Study (HREC:771/2019)

The purpose of the main study was to measure the effect of the TBRH intervention on IAw and ER using the quantitative measures of HRV and behavioural questionnaires and scales pre- versus post-intervention. Qualitatively, semi-structured interviews explored how participants experienced their RH pre- versus post-intervention. Additionally, the study design incorporated a retest control group who underwent the GNLBE-only for six weeks to understand the distinct effects of the breathing exercise from the full TBRH intervention.

3.10.1 Participants, Sampling and Enrolment

Forty-eight adult participants between the ages of 25-60 years were recruited from the general public. To recruit participants, advertisements were sent to corporate and other professionals via LinkedIn, Facebook and WhatsApp groups, school parent body networks,

and an anonymous database of UCT staff and alumni across departments (Appendix M). In addition, three community radio interviews were held to advertise the research project.

A two-part screening took place for inclusion in the study. The first criteria for inclusion and exclusion stipulated that all participants need to be healthy and between the ages of 25-60 years old. Individuals could not be on chronic prescription medication at the time or six months before screening, e.g., antidepressants, antiretrovirals, or insulin. Participants had to have had no exposure to or have no regular breathing or embodied practice in the past year including mindfulness, yoga, and reflective journaling. Participants had to be fluent in English, owing to the intervention being facilitated in English. Participants were also excluded if they had any cardiovascular or heart conditions, owing to the effect this may have on the record of heartbeat activity, using electrocardiography (ECG) which was used to determine HRV. Race, gender, religion, and culture were not stipulated.

The second screening took place online in the form of an information session, once the initial exclusion and inclusion criteria were met. The information session was held to give potential participants an overview of the programme and laboratory protocols. Additionally, the expected requirements from the participants were shared as it related to time commitment, confidentiality, the group format, and personal mental health considerations. The Bangor Assessment and Orientation Guide served as a guideline for the information session (Appendix C). At the information session, a second screening took place. Participants completed the PTSD Checklist for DSM-5 (PCL-5; Weathers, 2013). The PCL-5 comprises 20 items to address the DSM-5 criterion for PTSD (Appendix N). This replaced the pilot study PCL-C as a more reliable measure, given that the literature reported over-diagnosis of PTSD with the abbreviated version of the checklist (Blevins et al., 2015; Jones Wilkins et al., 2017; Netto et al., 2016; Watkins et al., 2018). Participants read the Participant Information sheet at the information session and signed the consent form (Appendix O). With the arrival of COVID-19 and the increase in stress levels at large, the PCL-5 was removed as an exclusion criterion.

Participants were recruited using convenience sampling, which is a non-probability sampling method (Jager et al., 2017). Thirty-two participants were sequentially divided on a first come basis into the intervention group (Group A) and the waitlist-control group (Group B), respectively. Both groups received the TBRH intervention with a waitlist design, i.e.,

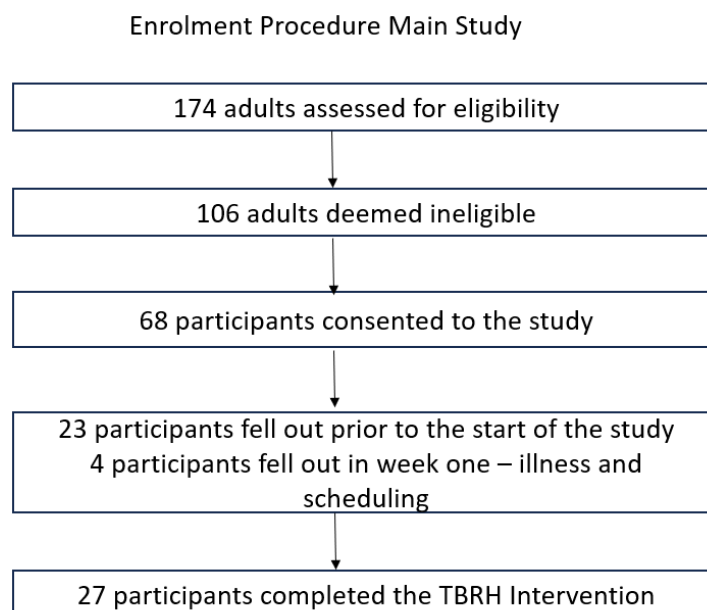
serving as control groups for each other. The additional 16 individuals formed the retest control group (Group C) and received the GNLBE exercise only for six weeks. To recruit participants for Group C, the Breathing-Only group, advertisements went out on LinkedIn and WhatsApp groups (Appendix P). In addition, the PhD candidate emailed and invited participants who had previously been excluded owing to the PCL-5, as this was no longer an exclusion criterion.

One hundred and seventy-four people were approached to enrol for the study. One hundred and six people failed to meet the inclusion criteria, and 68 participants were consented. Twenty-three participants changed their minds owing to scheduling or being away. Forty-five participants were enrolled in the study. Four participants fell out of the waitlist design after the first laboratory session and prior to starting the TBRH intervention. One participant had a heart attack in week two and withdrew from the study. Twenty-seven participants completed the TBRH intervention. Please refer to Figure 5 for the main study enrolment procedure.

Three participants fell out of the Breathing Only intervention. Two participants withdrew prior to the start of the intervention, owing to change in their scheduling. One participant was asked to withdraw in week two after discovering she attended regular Tai Chi.

Figure 5

Diagrammatic representation of the enrolment procedure for the Main Study.



The intervention took place online via Zoom version: 6.1.12 (46889). Group A and Group B were further divided into four groups of four to accommodate moving the intervention online, and to be faithful to the nature of the intervention which requires in-depth listening and attention to each participant by the facilitator which is timeous. The four groups ran consecutively at the same time, within the same week, on different evenings from 6 p.m. to 8 p.m., with weeks three and five extending to 8.30 p.m.

Group C also received the intervention via Zoom. Group C was divided into three groups and received the intervention on three consecutive evenings for 30 minutes over six weeks from 5.30 p.m. to 6 p.m., with the exception of week one, which ran for 45 minutes.

3.11 Procedures

3.11.1 Laboratory Testing Procedure

Groups A and B came into the laboratory at the Neuroscience Institute, Anzio Road, Groote Schuur, Cape Town. All participants came into the laboratory for three sessions: pre-Group A receiving the intervention (time point 0), post-Group A receiving the intervention (time point 1), and post-Group B receiving the intervention (time point 2). Thereafter, Group C, the Retest Group, came into the lab at two time points pre- and post-intervention (time point 0 and time point 1, respectively).

Participants entered a light-filled room and were guided to sit at a computer monitor. The room was not fully sound attenuated, however, owing to the time of day there was minimal external sound, and it did not cause disturbance or interfere with the physiological record. Participants were asked to remove all jewellery so that it did not get in the way of the equipment or generate movement which would affect the ECG. The PhD candidate attached the respiration belt before cleaning their clavicle and left rib with an alcohol swab followed by attaching the ECG discs to connect the participant to the recording equipment. During this setup, the PhD candidate gave the participant an overview of the first computerised task. Participants were reminded to sit still and keep any movement to a minimum to avoid interference with the recording of the physiological record.

Participants wore masks throughout the laboratory procedure owing to COVID-19, which might have impacted the physiological records. Studies show that breathing resistance increases with masks owing to the increased effort to breathe with a mask (Grimm et al.,

2022). After both tasks were completed, the respiration belt and ECG discs were removed, and the participants sat outside the lab and filled in the set of questionnaires. The same laboratory procedure was repeated at three different time points.

3.12 Measures

3.12.1 Neurobiological measures

3.12.1.1 Heart Rate Variability

HRV measures were calculated from the inter-beat intervals between successive heartbeats of the participants. HRV measures give information about the state of a participant's emotions, in particular their capacity for ER and the time it takes to recover from an emotional elicitor (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). HRV yields information about an individual's present adaption to life's stressors (Geisler et al., 2013; Thayer et al., 2012). HRV reflects the interplay of the excitatory SNS and the calming PNS, within the IBI between heartbeats (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). This autonomic outflow underpinning HRV can be modulated by the CAN and thus can serve as a neurobiological index for stress reactivity and ER (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005). The CAN comprises cortical, limbic, and brainstem areas involved in salience, emotional, and attention networks (Appelhans & Luecken, 2006). Autonomic, cardiac, and brain adaptation or maladaptation can be examined with HRV (Thayer et al., 2012; Thayer & Brosschot, 2005).

HRV measures are calculated in the time domain and the frequency domain. These measures give us detailed information about the central autonomic regulation of the heart. SDNN refers to the overall power in the heart in the time domain; it has been associated with secure attachment behaviours (Rockliff et al., 2008). High Frequency Power (HFP; 0.15 - 0.40Hz) is an index of the parasympathetic influence on the heart that reflects the effect of the breathing rate on the vagal nerve, known as Respiratory Sinus Arrhythmia. Low Frequency Power (LFP; 0.04 - 0.15Hz) reflects the baroreflex-mediated impact on cardiac vagal activity predominantly. In acute interventions, an increase in LFP indicates improvement in HRV (Prinsloo et al., 2013a; Zaccaro et al., 2018). Total Power (TP) refers to the total power within the heart in both the high and low frequency domains, akin to SDNN (Appelhans & Luecken, 2006; Thayer & Brosschot, 2005).

3.13 Respiration

Respiration was measured in conjunction with measuring the indices of HRV. The number of breaths per minute directly impacts HRV, given that the HR increases during the in-breath and decreases during the out-breath, and as such, respiration powerfully impacts ER. Respiratory frequency (RF) refers to breaths per second (i.e. in Hertz) to bring it in line with the frequency domain HRV measures that are also reported in Hertz. A decrease in breathing rate facilitates increased parasympathetic influence on the heart. We used a Biopac Respiration Transducer to record the respiratory rate with a low-pass filter set at 10 Hz. The transducer was connected to the Biopac MP150 system and measured changes in thoracic circumference that take place as the subject breathes.

3.14 Computerised Tasks

The psychophysiological laboratory testing session was programmed using E-Prime version 2. The analogue outputs from the E-Prime PC trigger the Biopac MP150 system (hardware) to synchronise the behavioural tasks with the biological data recorded with AcqKnowledge version 4.2 software. Before each task, the PhD student gave the participant an overview of the task before initiating the task instructions on the monitor. ECG and Respiration were recorded at three time points for the TBRH intervention group and the Waitlist Group (Group A & B) and at two time points for the retest group, the breathing-only intervention group (Group C). We aimed to see whether participants' HRV increased as a result of the intervention. ECG and respiration were recorded in the laboratory while participants performed two computerised tasks: a gold standard HRV 5-minute baseline task and a relational task that is a reduced version of a core exercise in the program and served as an emotional stressor task.

3.14.1 The Baseline Task

Figure 6

Visual representation of the Baseline Task

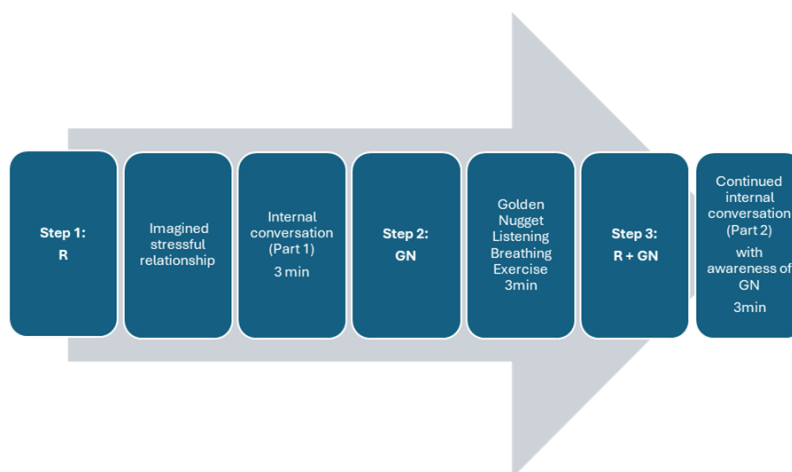


The Baseline task is a gold-standard HRV task (Malik et al., 1996). This exercise was used to measure participants' resting state HR and HRV at pre-intervention and post-intervention to deduce whether any chronic changes occurred as a result of the TBRH intervention. In addition to this, the Baseline Task served to determine all participants' baseline HRV pre-intervention. The PhD candidate gave the participant an overview of each task before initiating the E-Prime programme, which then repeated the instruction in stages on the PC monitor. For the Baseline task, participants were instructed to relax and sit quietly and at ease with their eyes closed for five minutes. Participants initiated the task using the mouse. A soft tone signalled the end of the task.

3.14.2 The Relationship Task

Figure 7

Visual representation of the Relationship Task



This task is a reduced version of a core exercise within the TBRH intervention. The exercise serves as both an acute intervention within the laboratory protocol as well as a measure for participants' improvement in ER over time.

The Relational task: The PhD candidate gave the participant an overview of the task before initiating the E-Prime programme which repeated the instructions step-by-step on the computer monitor. Participants read an overview of the whole task on the computer monitor.

The exercise:

1. Participants were asked to think of a stressful relationship and to focus on where they experienced it in their body and to intensify the sensations there. Participants were then instructed to close their eyes and to have an imagined internal conversation with this person. The conversation continued for three minutes. A soft tone alerted participants to open their eyes and read the next instruction.
2. Participants were then instructed on how to perform the GNBLE. They were instructed to close their eyes and begin the exercise which continued for three minutes. A soft tone alerted participants to open their eyes and read the next instruction.
3. Participants were asked to hold an awareness of their breathing while simultaneously continuing the conversation with the same person for three minutes with their eyes closed. A soft tone alerted participants to the end of this segment and to revert back to the screen.

Participants were asked to let go of the relationship and return to the present moment.

With a mouse, participants indicated they were ready to move to the next instruction. The same task was repeated two more times, for different stressful relationships. These could be personal, familial or professional relationships. Between each relationship task, there was a brief resting period to release the relationship, before the participant used the mouse to initiate the next relationship.

3.15 Measures

3.15.1 Quantitative Measures

The same questionnaires used for Study 1 were used for Study 2. Namely, the Multidimensional Assessment of Interoceptive Awareness (MAIA-2), the Five Facet Mindfulness Questionnaire (FFMQ), the Self-Compassion Scale (SCS), and the State-Trait Anxiety Inventory for Adults (STAI). Refer to Section 3.6.1.1 – 3.6.1.4 for details.

Participants completed the questionnaires by hand directly post the laboratory procedure and sitting outside the laboratory in the waiting room area.

3.16 TBRH Intervention Procedure

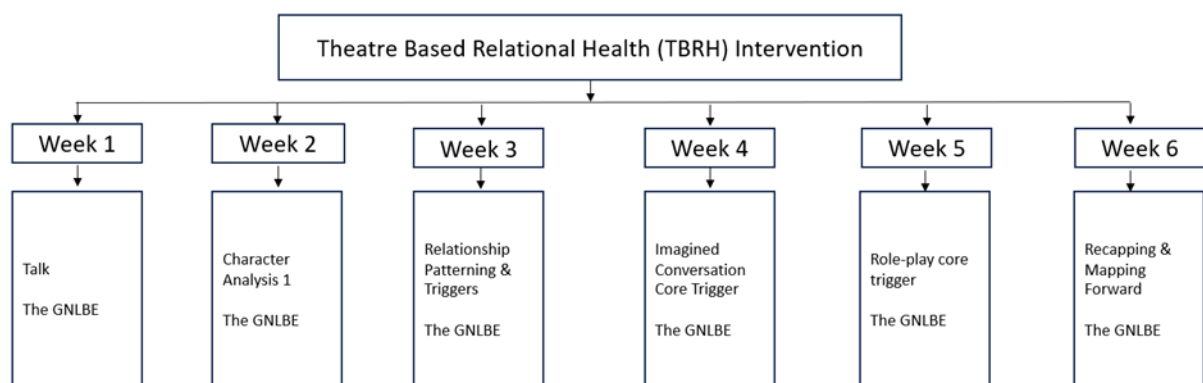
Once all the participants had been through the laboratory protocol, Group A received the TBRH intervention. Group B received the TBRH intervention after time point 1 once group A had completed the intervention.

3.16.1 The Theatre-Based Relational Health Intervention (Appendix I)

The same intervention description for Study 1 applies here to Study 2. Please refer to Section 3.5, page 61 for the full description of the TBRH intervention, and Table 3.1 for an overview of the intervention on page 63. See Figure 6 below for the weekly content of the TBRH intervention.

Figure 8

Diagrammatic representation of the week-by-week exercises in the TBRH intervention



During the intervention, should a participant be found to be in distress, a line of therapist referrals was available to be activated and followed. A list of therapists was to be provided to the participant as well as the link to the South African Depression and Anxiety Group (SADAG), Cape Mental Health in Observatory, who offer free counselling services, and The Counselling Hub in Woodstock (Appendix Q). The need for this line of referral never arose in the pilot or main study. Before the PCL-5 was withdrawn as a screening measure, participants were offered this line of referral if they scored over the standard criteria in the PCL-5.

3.17 The Breathing Only intervention

In week one, participants were given a talk on the scientific underpinnings of ER. Participants were taught the GNLBE. Weeks 2 – 6 they practiced the GNLBE only. Each week began and ended with participant feedback on their insights and their experiences of practising the GNLBE. Participants were instructed to practice the GNLBE daily for one to four minutes at a time as convenient to their routine. See Figure 7 below for the weekly content of the Breathing Only intervention, and Table 3.2 for an overview of the content of the Breathing Only intervention. The Breathing Only intervention was initiated once the waitlist design was completed.

Figure 9

Diagrammatic representation of the week-by-week exercises in the Breathing Only intervention

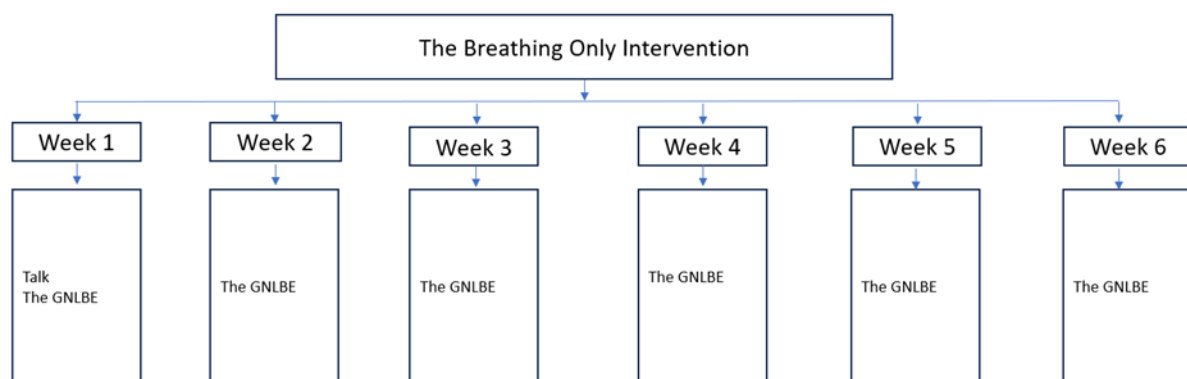


Table 3.2

Overview of the content of the Breathing Only Intervention

Overview of Session	
Week	
	Psychoeducational talk on emotion regulation and the psychophysiological impact of breathing.
1	The Golden Nugget Listening Breathing Exercise (GNLBE) is taught. Feedback on practicing the exercise.
2-6	The Golden Nugget Listening Breathing Exercise (GNLBE) is practiced.

3.18 Facilitator

As with the pilot study, the PhD candidate facilitated the intervention to safeguard content precision owing to a lack of trained facilitators in this methodology at this time. The candidate had weekly supervision, focusing on therapeutic facilitation, with a senior Clinical Psychologist. Supervision served as a reflective space and enabled the facilitator to debrief

regarding the nature and impact of the content that emerged from participants' lives, as well as the facilitator's experience of holding the group and providing support.

3.19 Qualitative Measures – Semi-structured Interviews

The semi-structured interview comprised 25 open-ended questions. It was designed for the pilot study and refined for the main study (Appendix R). The interviews aimed to investigate participants' experience of the TBRH intervention and its impact on their RH, i.e., their relationship with themselves and significant others in their lives. Interviews were conducted for up to two weeks post-intervention via Zoom and by an external researcher who is a registered Clinical Psychologist.

3.20 Data Analysis

3.20.1 Questionnaires

Cronbach alphas reliability tests were run for all questionnaires and subscales. We interpreted the data using $\alpha > 0.60$ as acceptable internal reliability (Mehling et al, 2018; 2017; Williams et al, 2014; Knowles and Olatunji, 2020). The pencil and paper answers were double-entered into an MS Excel spreadsheet and aggregated. The spreadsheet was imported into the R Statistical Package. Descriptive statistics were applied to infer probability in the data. First, the distribution of the data was assessed for normality using the Shapiro-Wilks test of normality. Normality is defined by the relationship between the central tendency described by the Mean (M) and its relationship with the standard deviation (SD), which can be no larger than three SDs from the M, giving us a probability of 99.7% of the population sample. Once the distribution was established, the next step was to determine whether there were any differences between the groups across the three time points: T0, T1, and T2. For this purpose, the normally distributed data, the Analysis of Variance (ANOVA) test was used to compare the variability within and across the three groups at the different time points to assess pre- to post-intervention differences. In the case of Groups A and B, the variability was assessed across three time points: T0, T1, and T2. In the case of Group C, the variability was assessed across two time points, T0 and T1.

The same process was applied for the non-parametric data, using the Kruskal-Wallis H test, which met the four assumptions for using the test and does not rely on the normality of distribution, as it is not sensitive to outliers. These results were reported using the central

tendency (M) and measures of variability (SD). We used the p -value with $p < 0.05$ to test significance. For all tests, $p = 0.05$ indicates significance for 95% of the population.

To determine where the differences between the groups were located, i.e., in which group and in which sub-scales, a linear regression model for the different time points for the normally distributed data was used. For the non-parametric data, the Mann-Whitney U test was used. Both models yielded the results for the specific differences within each sub-scale between the groups. M and SD were used to interpret the differences, and the p -value with $p < 0.05$ was used to determine significance.

To learn the effect of time, within each independent group, a repeated-measures ANOVA (rmANOVA) test for the normally distributed data and a Friedman ANOVA for the non-parametric data were performed. Within-group changes were analysed in the mean scores over the three time points for each group in which time became the categorical variable to the independent group variable. The more refined paired t -tests and Wilcoxon tests were run to confirm the significance found. The paired sample t -test was used in repeated-measures designs owing to its robust structure which measured each group twice, leading to pairs of observations. Where there were outliers in the data, and the assumptions of normality could not be met, the non-parametric Wilcoxon Signed Rank Test was used. The test computes the W-statistic which estimated a normal distribution for samples larger than 10, enabling the interpretation of results.

3.20.2 HRV

For HRV measures, an ECG 2 electrode montage was used, the ECG amplifier was connected to a Biopac MP150 system and AcqKnowledge software was used to record the ECG traces. The ECG amplifier settings were set as follows: gain set at 1000; mode normal; sampling frequency of 500 Hz. ECG traces were passed through an FIR bandpass filter with a hamming window. Low frequency cut-off was set at 0.5 Hz and high frequency cut-off at 35 Hz.

After the ECG traces were bandpass filtered (0.5HZ – 35HZ) to remove electronic interference, the R peaks in the ECG traces were detected using the AcqKnowledge software. If a particular ECG trace was too noisy, the output of the R peak detector software had to be manually inspected for missing R peaks and for false R peaks that may be due to noise or ectopic beats. If all the R peaks were successfully detected and the noise and ectopic beats

removed, the intervals between successive R peaks (for the whole ECG trace) were calculated. This series of IBI is known as a tachogram. Due to excessive noise in parts of their ECG graphs, six participants were removed from the HRV data analysis. The tachograms were then imported into Kubios software, a fully automated HRV software analysis program developed by the Biomedical Signal Analysis Group, Department of Applied Physics, University of Kuopio, Finland. Autoregressive analysis was utilised to convert time (i.e., IBI) into frequency and to sum the power in the high (0.15 to 0.5 Hz) and low (0.04 to 0.15 Hz) frequency bands. The Kubios software also calculated the time domain measures such as SDNN, root mean square of successive difference (RMSSD), and normal to normal (NN) intervals. Once the autoregressive analysis was complete, the time and frequency domain HRV measures were transferred into an Excel spreadsheet. The Excel spreadsheet was imported into Statistical Package for the Social Sciences (SPSS) to perform the statistical analyses. The frequency domain HRV data sets were natural log transformed to normalise the data.

Shapiro Wilks was performed to assess the data for normal distribution. For the normally distributed data, ANOVA was performed to assess differences between the groups at baseline and over the three time points. If there were significant differences, a Scheffé post hoc test was run to locate where the differences were. For the non-parametric data, a Mann-Whitney Wilcoxon Test was performed to assess the differences between two independent groups and a Kruskal Wallas Test was used to assess differences across three independent groups at baseline and for the Relationship Task. To learn the effect of time within each independent group, a rmANOVA test for the normally distributed data and a Friedman ANOVA for the non-parametric data were performed.

To determine whether there were associations between the questionnaires and HRV measures, linear regressions were derived for the normally distributed data. Linear regressions are reported as Pearson's correlations symbolised by r . For non-parametric data sets, we conducted Spearman Ranks Correlations symbolised as ρ .

All parametric data sets are reported as mean $\pm$ standard deviation (SD). The non-parametric data sets are reported as median $\pm$ interquartile ranges (IQR). A p -value of $p < 0.05$ indicates significance, with $p < 0.01$ indicating a more robust test significance.

3.20.3 Qualitative Analysis

Study 2 applied thematic analysis with deductive coding. A realistic thematic analysis with semantic-level themes was utilised to analyse the data. Interviews were analysed to understand participants' personal and lived experiences of the TBRH intervention. The interviews were analysed at face value by paying attention to the participants' meaning-making and noting the language that they used in order to comprehend their subjective experience of the TBRH intervention and whether they experienced any changes in their relational health pre- versus post-intervention. Semantic-level themes were used to explore the participant's experience.

To address the bias of having developed and facilitated the intervention, the PhD candidate included a second researcher to independently analyse the data in Study 2. Thus, two researchers analysed the data independently – the PhD candidate and an external researcher, a Clinical Psychologist with prior experience in qualitative data analysis. Braun and Clark's six-step thematic analysis approach was followed (Braun & Clarke, 2006, 2013). First, the data were transcribed verbatim by an independent transcriber. Independently, both analysts familiarised themselves with the data by first listening to the audio recordings and then reading through the transcripts and noting down initial impressions. Transcripts were read several times, identifying codes across the data set. Once codes were selected, the data were placed into selected relevant codes. At stage three, the analysts met to discuss their findings, compare codes and place them into potential themes. Phases three and four took many iterations to review the themes in relation to the coded extracts and the entire data set. In step five, the two analysts collaboratively defined and named the themes. Each theme was checked against the overall narrative of the data that had emerged with the analysis of the data. In step six, extracts that best spoke to each theme were selected from the data by both analysts, who then subsequently came together to compare and consolidate the extracts. To establish inter-coder reliability, the PhD candidate and external researcher compared their preliminary list of codes and refined individually and together throughout the five stages in an iterative process. The PhD candidate wrote up the findings for her PhD dissertation.

3.21 Ethical Considerations

3.21.1 Ethics Approval

Ethics approval was obtained from the University of Cape Town's Health Science Faculty Human Research Ethics Committee for Study 1 – The Pilot Study (UCT FHS HREC

68/2019), and Study 2 - The Main Study (UCT FHS HREC 771/2019), (Appendices S and T). All research was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013). Participation was voluntary and all participants signed informed consent (Appendix O).

3.21.2 Data Safety, Privacy, and Confidentiality

The PhD candidate conducted the data collection except for the qualitative interviews which were conducted by external researchers. The PhD candidate was responsible for the storage of all the data.

All data collected were delinked by the PhD candidate from the participants' personal identifiers, and their names were replaced with numbers post-collection. The exception to this is the Zoom recordings of the intervention sessions. These were stored on the PhD candidate's password-protected laptop, in addition to an external hard drive, which is stored in the candidate's office. The quantitative behavioural data were administered with pen and paper and were kept in a box in the candidate's office. The psychophysiological recordings were collected in the laboratory having already changed the names of the participants to numbers. For the qualitative data, three people had access to the data. The PhD candidate, the external researcher who conducted the interviews, and the transcriber. Both the interviewers and transcribers signed confidentiality agreements (Appendix U). Furthermore, once the interviews had been conducted and downloaded, the audio recordings were deleted, and the originals remained only with the PhD candidate and saved on a password-protected laptop. The analyses were performed on data which had already been anonymised through the application of a participant number replacing the participant's name.

Chapter 4

RESULTS AND FINDINGS

This chapter presents the quantitative results and qualitative findings for Study 1 and Study 2. Study 1, the pilot study, presents findings for the feasibility and acceptability of the TBRH intervention, and additionally, its preliminary efficacy as evidenced through quantitative results and qualitative findings with regard to the core constructs targeted within the TBRH intervention, namely IAw, ER, and RH. Study 2, the main study, presents neurobiological results for HRV to demonstrate changes in the brain-heart nexus for IAw and ER as a result of the TBRH intervention. Additionally, results are shown for the behavioural questionnaires that verify changes in IAw and ER. Finally, qualitative findings are presented which describe participants' experience of the TBRH intervention and changes in their RH pre- versus post-intervention.

4.1 Study 1 – Pilot Study

4.1.1 In total, fourteen participants were enrolled in the pilot study. Two participants dropped out in week one, owing to illness and time constraints, respectively. Twelve participants ($n = 12$) completed the TBRH intervention. One participant was excluded from the questionnaire analysis owing to the discovery that she had been meditating until just before the intervention. Participants' ages ranged between 28 and 50 years.

4.1.2 Feasibility and acceptability of the intervention

The TBRH intervention proved feasible to participants indexed by the 85.7% high retention rate (Bluth et al., 2016; Henje Blom et al., 2016; Hjeltne et al., 2017).

The format and exercises were deemed acceptable, as reported in the semi-structured interviews. The timing of the sessions (extended in Weeks 3 and 5 by 30 minutes) was also deemed acceptable. The chosen venue on the institutional premises was considered acceptable. The intention at the outset of the programme was to have participants log homework via email. This proved unsuccessful and was removed in Study 2. Participants reported that logging homework via email felt cumbersome, and WhatsApp and Google Calendar were suggested as better options if included going forward. The facilitator found it was beneficial to encourage participants to practise the GNLBE exercise within their daily routines for a time period of between one and four minutes. The group format was unanimously identified as a powerful construct, enabling sharing, peer learning, connection,

and common humanity. Moreover, in the context of South Africa, where racial issues are prevalent, the diversity of the group was uniformly cited as a significantly positive attribute, enriching peer learning and points of shared connection, as demonstrated by the following statement:

“I loved the group, I thought it was a great mix of people from all walks of life, all being open and honest. ... it was a real safe, authentic space and everyone shared usefully ... it felt like a little safe space. ... watching people's growth was phenomenal as well. It was amazing to see other people's insights and how they shifted. So that was encouraging, and people letting down their guard and just really, sharing personal private experiences openly”.

(48-year-old female participant)

The role of the facilitator was referenced across interviews, with participants citing the importance of having “the right” facilitator that listens, values, empathises and does not judge. Participants reported these attributes as the *modus operandi* of the group:

“She was calm. She nurtured, you know, she didn't push people.... it was about nurturing and guiding you... and the empathy, you know.”

(41-year-old female participant)

The professional conduct, preparation, and readiness of space were acknowledged as important. In recommending the programme, participants collectively mentioned a rigorous probing of self-awareness with the purpose of improving relationships, with the GNLBE cited as a practical tool to stay calm and use when a crisis ensues. The target population recommended by participants ranged from those suffering from anxiety and depression to anyone wanting to gain tools to handle life's challenges.

4.1.3 Questionnaire Results

Three participants did not complete the full questionnaires. Eleven participants completed the MAIA-2, and ten participants completed the FFMQ and the SCS pre- and post-intervention. All measures demonstrated sufficient reliability, with Cronbach's Alpha ranging between 0.61-.93 for the MAIA-2, 0.59 – 0.89 for the FFMQ, 0.59-0.87 for the SCS and 0.87 – 0.93 for the STAI. These results are captured in Appendix V.

Significant changes were found for subscales of the MAIA-2, FFMQ, and SCS from pre- to post-intervention (please refer to Table 4.1). For the MAIA-2, increases were found in subscales: Noticing ($z_{n11}=2.00, p = 0.045$), Emotional Awareness ($z_{n11}=2.84, p = 0.012$), Self-Regulation ($t_{n11}=4.02, p = 0.0024$), and Body-Listening ($z_{n11}=2.84, p = 0.0044$). For the FFMQ increases were found in subscales: Observing ($t_{n10}=2.77, p = 0.021$), Acting with Awareness ($t_{n10}=2.39, p=0.040$), Non-Reactivity to Inner Experience ($t_{n10}=5.45, p = 0.0040$). The SCS showed significant increases in its Total Score ($t_{n10}=2.70, p = 0.024$) and subscale Self-Kindness ($t_{n10}=4.38, p = 0.0017$). Please refer to Table 4.1.

Table 4.1*Significant results for pre vs post TBRH intervention for pilot study*

	Pre-TRBH intervention							Post TBRH intervention						Test results
	Mean	Std.Dev.	Median	Range				Mean	Std.Dev.	Median	Range			
Multidimensional Assessment of Interoceptive Awareness (MAIA-2)														
Noticing	3.59	0.74	3.75	2.50	-	5.00	*	4.16	0.45	4.00	3.75	-	5.00	$z=2.00$, $*p=0.045$
Not-distracting	2.96	0.90	3.00	1.00	-	4.00		2.94	0.45	3.00	2.16	-	4.00	$t=0.10$, $p=0.921$
Not-worrying	3.39	0.53	3.50	2.60	-	4.00		3.31	0.58	3.20	2.40	-	4.20	$t=0.65$, $p=0.530$
Attention Regulation	3.36	0.69	3.43	2.00	-	4.43		3.68	0.50	3.71	2.86	-	4.42	$t=1.64$, $p=0.132$
Emotional Awareness	3.67	0.57	3.60	2.80	-	4.60	*	4.20	0.33	4.00	3.80	-	4.80	$z=2.84$, $*p=0.012$
Self Regulation	3.25	0.77	3.50	2.00	-	4.00	*	4.02	0.53	4.00	3.00	-	5.00	$t=4.02$, $*p=0.002$
Body Listening	2.35	0.85	2.33	1.00	-	3.66	*	3.67	0.60	4.00	3.00	-	4.33	$z=2.84$, $*p=0.0040$
Trusting	3.82	0.64	3.66	3.00	-	4.67		4.09	0.45	4.00	3.33	-	5.00	$t=-1.70$, $p=0.119$
Five Facet Mindfulness Questionnaire (FFMQ)														
Observing	26.40	4.48	26.50	19.00	-	33.00	*	30.50	3.72	30.50	22.00	-	36.00	$t=2.77$, $*p=0.021$
Describing	27.80	4.39	29.50	19.00	-	34.00		29.10	5.26	31.00	20.00	-	35.00	$t=-1.516$, $p=0.163$

Acting with Awareness	25.50	5.76	23.50	17.00	-	35.00	*	28.60	4.33	29.00	19.00	-	34.00	$t=2.39,$ $*p=0.040$
Non-judging of Inner Experience	25.30	6.82	26.50	13.00	-	35.00		25.40	6.02	23.50	18.00	-	37.00	$t=-0.07,$ $p=0.945$
Non-reactivity to Inner Experience	19.30	4.24	19.50	13.00	-	25.00	*	24.10	2.88	25.00	20.00	-	28.00	$t=5.45,$ $*p=0.0040$
Self-Compassion Scale (SCS)														
Self-Kindness	2.84	0.72	2.80	1.80	-	4.40	*	3.80	0.34	3.90	3.40	-	4.40	$t=4.38,$ $*p=0.0017$
Self-Judgement	3.10	0.96	3.40	1.60	-	4.20		2.78	0.44	2.70	2.20	-	3.60	$t=1.30,$ $p=0.226$
Common Humanity	3.38	0.91	3.38	1.50	-	4.75		3.78	0.40	3.63	3.25	-	4.50	$t=-1.693,$ $p=0.125$
Isolation	3.00	0.68	3.00	1.75	-	4.25		2.75	0.62	2.75	1.75	-	4.00	$t=1.023,$ $p=0.333$
Mindfulness	3.28	0.72	3.13	2.25	-	4.75		3.80	0.50	3.75	3.00	-	4.75	$t=-1.875,$ $p=0.093$
Over-identified	3.13	1.13	3.13	1.75	-	4.75		2.70	0.66	2.63	1.75	-	4.00	$t=1.551,$ $p=0.155$
Total SCS score	3.05	0.68	2.84	2.35	-	4.23	*	3.53	0.39	3.55	2.84	-	4.18	$t=2.70,$ $*p<0.024$

11 participants completed the MAIA-2, 10 participants completed the FFMQ and SCS, both prior and post the Theatre Based Relational Health (TBRH) intervention. $*p < .05$

4.1.4 Preliminary effectiveness of the TBRH intervention in relation to the core constructs of self-awareness, ER, and RH.

Qualitative interviews aimed to explore participants' experience of the TBRH intervention in relation to its targeted core constructs – to improve self-awareness, ER, and RH. *A priori* coding with a realist thematic analysis was used. These core constructs informed the thematic categories within the interviews which then expanded to their corresponding sub-themes (refer to Table 4.2 for thematic analysis findings).

Table 4.2

Thematic Analysis themes and subthemes

Themes	Subthemes
1. Enhanced Self-awareness	Self-awareness and behaviour Different parts of the self with self-nourishing Past experience into present behaviour Optimism and confidence.
2. Improved Emotion Regulation and the GNLBE	GNLBE as a preparatory and recovery tool GNLBE in the context of relationships GNLBE for sleep GNLBE for anxiety
3. Positive Relational Changes	Listening Connecting Non-judgement Relational triggers (or core reactivity) Empathy and Perspective taking

Theme 1: 'Enhanced Self-Awareness'

Four sub-themes were identified under the overarching theme of 'Enhanced Self-Awareness': self-awareness and behaviour; different parts of the self with self-nourishing; past experience into present behaviour; and optimism and confidence. While distinct in their

content, the first three sub-themes highlighted ‘self-awareness’ as the mechanism for change within inner life and relationships, and the consequent changes in behaviour. Participants identified parts of themselves that were contributing to challenges in their relationships and felt that this increase in self-awareness could shift the nature of their relationships:

“That really kinda brought it to light, what happens, when I'm in a particular character, what's my behaviour, I had characters that I didn't like and then characters that I liked. In fact, the characters that I didn't like, we were pushed to understand what would be the opposite of that. I had goga [bug/creature] one of my BAD self, irrespective of age. If you mess around with me, to protect myself, I emotionally cut you off”

(48-year-old male participant)

A significant sub-theme that was identified in the data related to how past experience influences one’s current behaviour within relationships:

“I had this epiphany about, what a lot of my feelings of not being heard, my feelings of not being valued, um, not being able to add value, um, stems from a lot from my social, political upbringing.... where I found myself, as a coloured woman in the heart of apartheid”.

(50-year-old female participant)

Theme 2: ‘Improved Emotion Regulation and the GNLBE’

Four sub-themes were identified: GNLBE as a preparatory and recovery tool, GNLBE in the context of relationships, GNLBE for sleep, and GNLBE for anxiety. Participants cited a feeling of safety emerging with the exercise. Participants unanimously related the value of the ‘Golden Nugget Listening Breathing Exercise’ in regulating different aspects of their lives and their relationships. This ranged from managing anxiety to inhibiting relational outbursts, preparing for - and recovering from - the day, and improving sleep:

“... it's one of the essential tools that you can use in your daily life. ...especially if, if you're in a stressful situation, if you feel like you're going through anxiety. And I found that with that exercise you become so conscious of your surroundings and how you react with somebody else...it's like an essential tool like to cope with in life.”

(31-year-old female participant)

Theme 3: ‘Positive Relational Changes’

This theme included several overlapping sub-themes, namely listening, connecting, non-judgement, relational triggers (or core reactivity), empathy, and perspective-taking. Participants recounted how relationships with partners, work colleagues, children and aging parents improved. They conveyed an increased ability to communicate and connect with their partners and children and an ability to put boundaries in place with work colleagues with both assertiveness and kindness:

“... the workshop also was able to provide the platform for myself and my wife to see things that we've never shared with one another. And it was quite shocking and surprising to hear the views of my spouse, um, also surprising for myself that I'm sharing things that I would never share with her; um, and so, that really strengthened our relationship as husband and wife. So, certainly, there's been an improvement in my relationship within my marriage firstly.”

(33-year-old, male participant)

“... we shared things that we didn't ever share with each other; um, that he might've not thought it was maybe like a burning inside for me. Like I said, if something bothers me, I always go into flight mode”.

(31-year-old, female participant)

4.2 Study 2 – Main study

4.2.1 Participants

In total, 32 participants ($n = 32$) were enrolled in the main study for the TBRH intervention. Four participants were lost to follow-up before the start of the intervention owing to time commitments, and one participant was lost to follow-up in week two owing to a heart attack. The mean age of the sample was 48.57 ($SD = 7.48$), ranging between 34 and 59 years. The majority of the sample was female ($n = 21$; 75%), with the remaining participants identifying as male ($n = 7$; 25%). Most of the participants indicated White ($n = 18$; 64.3%) as their race and 10 participants (35.7%) indicated their race as Coloured. The sample reported high levels of education, with most participants having an undergraduate degree (35.7%). More than two-thirds of participants were married or in a lifetime

partnership ($n = 19$; 67.9%). The mean weight for the sample was 75.69 kilograms (SD = 16.95), and the mean height for the sample was 166.64 centimetres (SD = 23.59). The demographic characteristics of the TBRH intervention group are summarised in Table 4.3 below.

Table 4.3

Participant demographics for Study 2

TBRH Intervention (N=28)			Breathing Only Intervention (N=13)		
	$\bar{x}$			$\bar{x}$	
Age			Age		
Mean	48.57		Mean	43.08	
Medium	48.00		Medium	45.00	
Stan Dev	7.48		Stan Dev	10.97	
	<i>f</i>	%		<i>f</i>	%
Race			Race		
White	18	64.3%	White	8	61.5%
Coloured	10	35.7%	Coloured	3	23.1%
Black	0	0.0%	Black	2	15.4%
	<u>28</u>			<u>13</u>	
	<i>f</i>	%		<i>f</i>	%
Gender			Gender		
Female	21	75.0%	Female	11	84.6%
Male	7	25.0%	Male	2	15.4%
	<u>28</u>			<u>13</u>	
	<i>f</i>	%		<i>f</i>	%
Level of Education			Level of Education		
Matric	1	3.6%	Matric	2	15.4%
Diploma	7	25.0%	Diploma	3	23.1%
Undergraduate Degree	10	35.7%	Undergraduate Degree	5	38.5%
Masters	7	25.0%	Masters	3	23.1%
PhD	3	10.7%	PhD	0	0.0%
	<u>28</u>			<u>13</u>	
	<i>f</i>	%		<i>f</i>	%
Marital/Relationship status			Marital/Relationship status		
Single	3	10.7%	Single	4	30.8%
In relationship	3	10.7%	In relationship	1	7.7%
Married/ partnership	19	67.9%	Married/ partnership	5	38.5%
Divorced	3	10.7%	Divorced	3	23.1%
	<u>28</u>			<u>13</u>	

For the retest, Breathing Only intervention group, 16 participants ($n = 16$) were enrolled. Two participants withdrew prior to the intervention, and one participant was lost to follow-up in week two owing to the discovery she had an existing embodied practice of Tai Chi and did not meet inclusion. The mean age of this subsample was 43.08 (SD = 10.97), ranging between 27 and 59 years. The majority of the sample was female ($n = 11$; 84.6%), with the remaining participants identifying as male ($n = 2$; 15.4%). Most of the participants identified White ($n = 8$; 61.5%) as their race, three participants identified as Coloured ($n = 3$, 23.1%), and two participants identified as Black ($n = 2$; 15.4%). Similar to the TBRH intervention group, most of the participants in this sample had an undergraduate degree (38.5%). More than one-third of participants were married or in a lifetime partnership ($n = 5$; 38.5%). The mean weight for the sample was 73.62 kilograms (SD = 14.29), and the mean height for the sample was 168.58 centimetres (SD = 9.36).

The demographic characteristics of the retest, breathing-only intervention group are summarised in Table 4.3. All participants were healthy and not on prescribed medication to treat chronic health conditions. They did not participate in regular breathing or embodied practices in the year prior to the intervention, including meditation, yoga, or daily reflective journaling. Participants were required to be fluent in English as this was the medium of facilitation.

4.2.2 Heart Rate Variability Results

4.2.2.1 Baseline Results

There were no significant differences at baseline between Groups A, B, and C. Please see Table 4.4 for baseline results. In addition, having measured each group at every time point and found no significant differences between the groups over time, we collapsed the three time points into two time points to signify pre- and post-intervention baseline HRV measures. Linear regression analyses were then performed between baseline pre-post HRV measures versus pre-post questionnaire scores

Table 4.4*Baseline Results for Groups A, B and C at T0*

Variable	Group A (n = 14)		Group B (n = 11)		Group C (n = 9)		p
	M (SD)	Med (IQR)	M (SD)	Med (IQR)	M (SD)	Med (IQR)	
HR ^p	70.1 (10.6)		72.4 (9.5)		72.5 (10.0)		.799
RF ^p	0.2 (0.1)		0.2 (0.1)		0.2 (0.1)		.738
SDNN ^{np}		44.5 (31.9)		28.7 (17.6)		41.4 (20.0)	.080
RMSSD ^{np}		36.2 (27.6)		22.5 (23.1)		28.5 (20.1)	.147
lnHF ^p	6.0 (1.50)		5.3 (1.3)		5.9 (0.8)		.480
lnLF ^{np}		6.7 (2.4)		5.6 (1.9)		6.8 (1.4)	.359
lnTP ^{np}		7.5 (1.7)		6.5 (1.5)		7.3 (1.9)	.102

Note. Mean = M; Standard Deviation = (SD); Median = Med; Interquartile Range = (IQR). HR = Heart Rate, RF = Respiratory Frequency, SDNN = Standard Deviation of Normal to Normal, RMSSD = Root Mean Square of Successive Differences between normal heartbeats, lnHF^p = natural log transformed high frequency power, lnLF^{np} = natural log transformed low frequency power, lnTP = natural log transformed total power.

^p Parametric data; ^{np} Non-parametric data

4.2.2.2 Relationship Task Results

4.2.2.2.1 Pre-Post intervention Differences for the Laboratory Relationship Task

This study found no significant differences in HR and HRV measures in the Relationship Tasks between Groups A and B, across time points T0, T1, and T2. Similarly, we found no significant differences in the Relationship Task for Group C, between time points T0 and T1.

In the context of no significant differences between groups, we compared HR and HRV measures for each group pre- versus post-intervention. There were no significant differences in HR and HRV measures for the Relationship Task pre- versus post-intervention.

This enabled the study to combine all the participants into a composite group of 34 participants to assess the acute effects of the breathing intervention in the relationship task on the HR and HRV measures both within each laboratory protocol and between the pre- and post- laboratory protocols. A representative Relationship Task was selected to statistically describe the acute effect the breathing intervention had on the Relationship Task and its impact on HR and HRV measures. Please refer to the Section 3.13.2. for a full description of the Relationship Task.

4.2.2.2.2 Significant Acute Effects for the Relationship Task

R = the imagined stressful relationship and part 1 of the internal conversation (3min)

GN = the Golden Nugget listening Breathing Exercise (3min)

R + GN = part 2 of the stressful conversation with held awareness of the GN (3min)

Our data demonstrated that despite there being no significant differences in HR, all the HRV measures (except for lnHFP) and RF changed significantly from R to GN to R+GN.

Heart Rate (HR)

We found no significant differences over time in heart rates from R1 to GN to R+GN ($p = 0.276$) pre-intervention (73 ± 11 vs 74 ± 10 vs 75 ± 10 beats/min) or post-intervention (72 ± 10 vs 72 ± 10 vs 73 ± 10 beats/min), nor were there significant differences from pre- to post-intervention

Respiratory frequency (RF)

We found a significant time effect for RF for the combined 34 participants in the pre-intervention relationship task from R to GN to R+GN breaths/second: ($R = 0.27 (0.09) > GN = 0.13 (0.07) < R+GN = 0.18 (0.09)$, $p < 0.001$). There was also a significant difference in RF over time in the post-intervention relationship task from R to GN to R+GN breaths/second: ($R = 0.28 (0.10) > GN = 0.13 (0.12) < R+GN = 0.17 (0.12)$ breaths/second, $p < 0.001$). RF during R+GN was significantly lower than it was during R both in the pre-intervention ($p = 0.003$) and post-intervention ($p = 0.002$) relationship task, indicating the carry-over effect of the breathing intervention GN on the breath in R+GN.

Standard Deviation of Normal to Normal (SDNN)

The study found a significant increase in SDNN for the combined 34 participants in the pre-intervention relationship task from R to GN and a significant decrease to R+GN ($R = 26.04 (21.64) < GN = 46.46 (36.85) > R+GN = 32.56 (29.74)$, $p < 0.001$). SDNN during R+GN was not significantly greater than it was during R ($p = 0.157$). There was also a significant increase for the combined 34 participants in the post-intervention relationship task from R to GN, and there was a non-significant ($p = 0.345$) decrease to R+GN ($R = 26.53 (19.54) < GN = 38.15 (28.43) - R+GN = 34.65 (26.86)$ msec. SDNN during R+GN was significantly greater than R ($p = 0.007$), indicating that the effect of the GN breathing intervention carried through and improved the SDNN during the second conversation.

Natural Log Transformed Low Frequency Power (lnLFP).

We found a significant increase in natural log-transformed LFP (lnLFP) for the combined 34 participants in the pre-intervention relationship task from R to GN, and a

significant decrease to R+GN ($R = 5.7 \pm 1.0 < GN = 7.1 \pm 1.3 > R+GN = 6.4 \pm 1.2$, $p < 0.001$). There was also a significant difference in lnLFP for the combined 34 participants in the post-intervention relationship task from R to GN to R+GN ($5.8 \pm 1.0 < 6.9 \pm 1.4 > 6.3 \pm 1.4$; $p < 0.001$).

lnLFP was significantly greater during R+GN compared to R in both the pre- and post-intervention laboratory sessions.

Natural Log Transformed Total Power (lnTP)

There was a significant difference in natural log transformed TP (lnTP) for the combined 34 participants in the pre-intervention relationship task from R to GN to R+GN ($R = 6.4 \pm 1.0 < GN = 7.4 \pm 1.2 > R+GN = 6.8 \pm 1.1$, $p < 0.001$). There was also a significant difference in lnTP for the combined 34 participants in the post-intervention relationship task from R to GN to R+GN ($R = 6.3 \pm 0.9 < GN = 7.2 \pm 1.1 > R+GN = 6.8 \pm 1.2$) post-intervention.

The lnTP was significantly greater during R+GN compared to R in both pre- and post-intervention (both $p < 0.001$), indicating the total power in the heart increased during the GNLBE breathing and carried over into the second conversation after the breathing intervention.

4.2.2.3 Correlations Between the Questionnaires and Heart Rate Variability

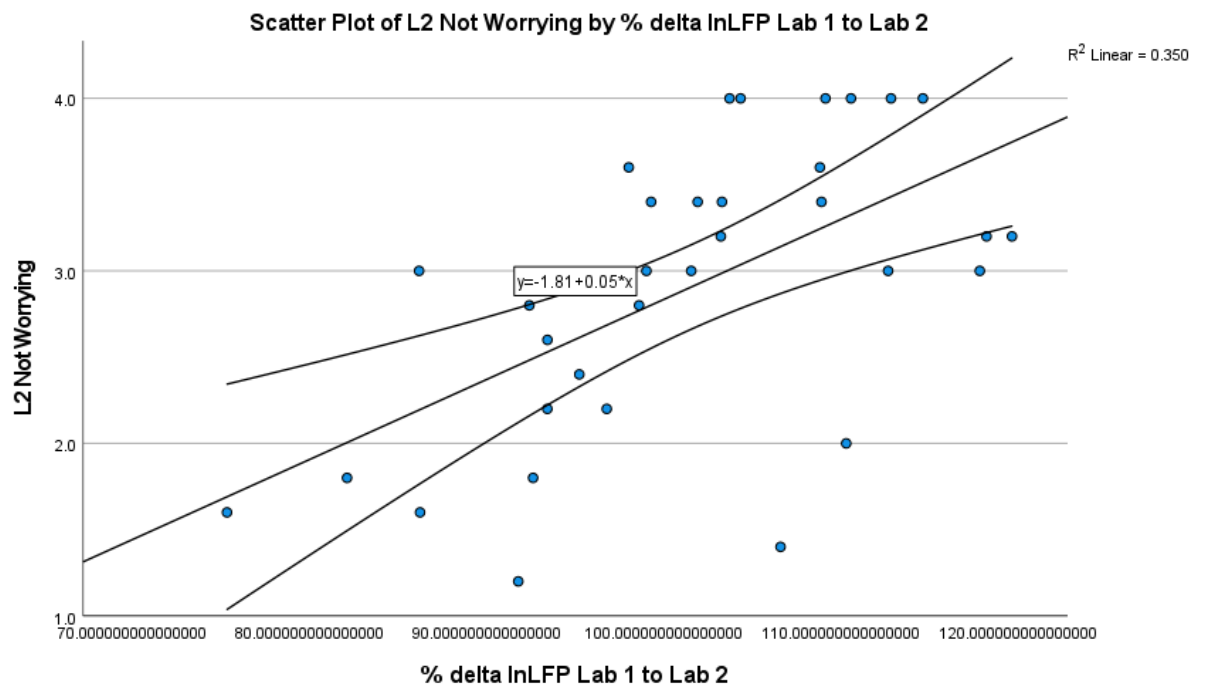
For the pre-intervention analyses, we found no significant associations between any of the HRV measures and questionnaires. However, we found several significant associations between the HRV measures and questionnaires at the post-intervention assessment.

4.2.2.3.1 Significant Correlations Pre to Post-Intervention

In the MAIA-2, there was a significant correlation between the participants' post-intervention 'Not-Worrying' scores and the % increase in lnLFP in their cardiac spectrograms from pre- to post-intervention ($n = 33$; $\rho = 0.611$, $p < 0.001$). Figure 10 illustrates the relationship between the participants' post-intervention 'Not Worrying' scores on the y-axis and the % change in the lnLFP in their cardiac spectrograms from pre- to post-intervention on the x-axis.

Figure 10

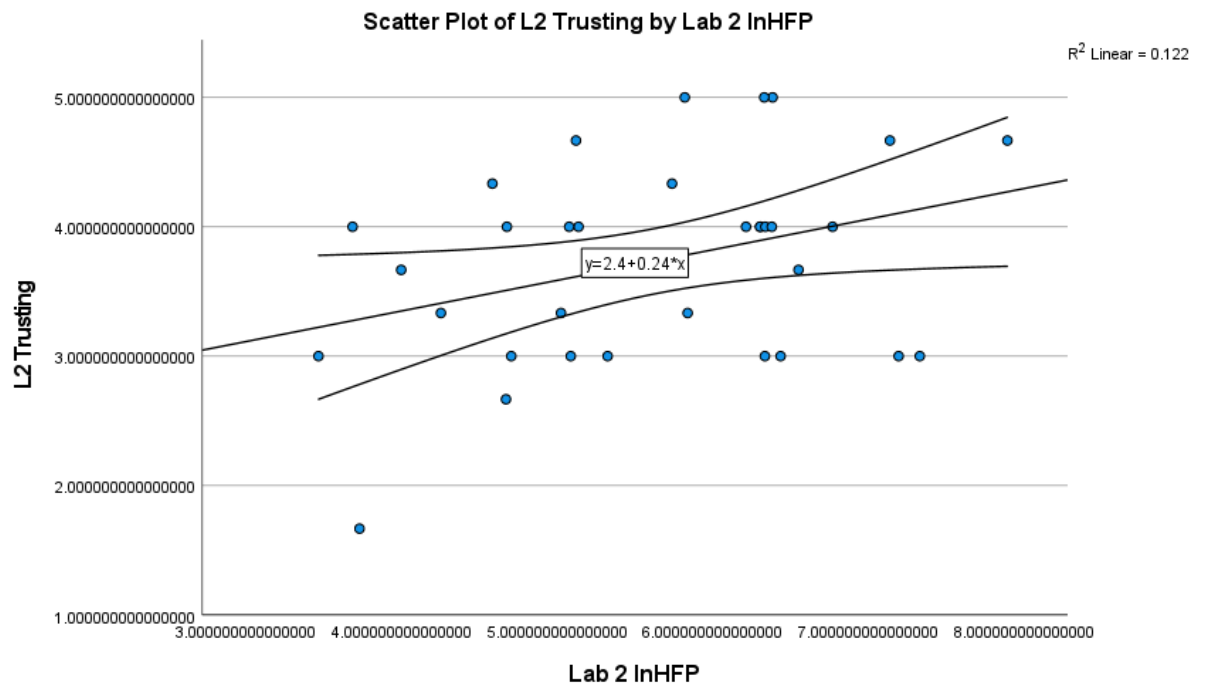
Scatter Plot of correlation between 'Not Worrying' and InLFP post-intervention



There was a significant correlation between the participants' 'Trusting' scores and the increase in the InHFP in their cardiac spectrograms post-intervention only ($n=34$, $r = 0.349$, $p = 0.043$), showing the association between participants' increase in Trusting and an improvement in their HRV in InHFP. Figure 11 illustrates the post-intervention relationship between the participants' 'Trusting' scores on the y-axis and the InHFP in their cardiac spectrograms on the x-axis.

Figure 11

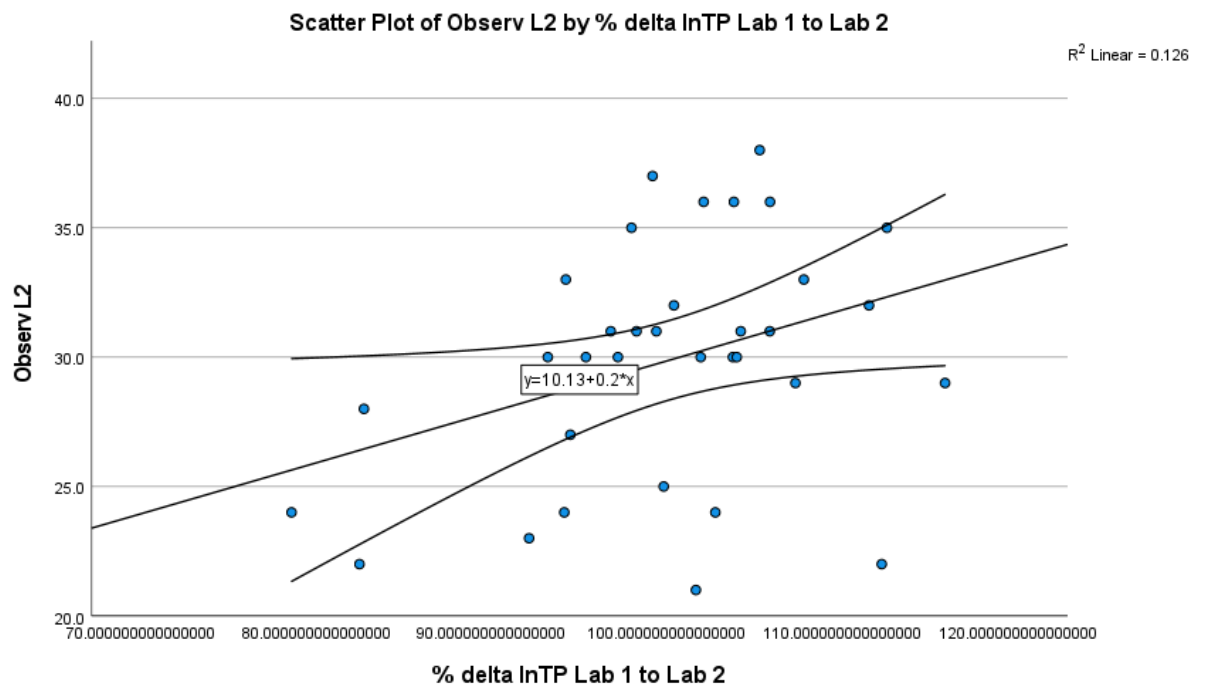
Scatter Plot of correlation between 'Trusting' and lnHFP post-intervention



In the FFMQ, there was a significant correlation between participants' post-intervention 'Observing' scores and the % increase in lnTP in their cardiac spectrograms from pre- to post-intervention ($n = 34$; $r = 0.349$, $p = 0.039$). Figure 12 illustrates the relationship between the participants' post-intervention Observing scores on the y-axis and the % change in the lnTP in their cardiac spectrograms on the x-axis.

Figure 12

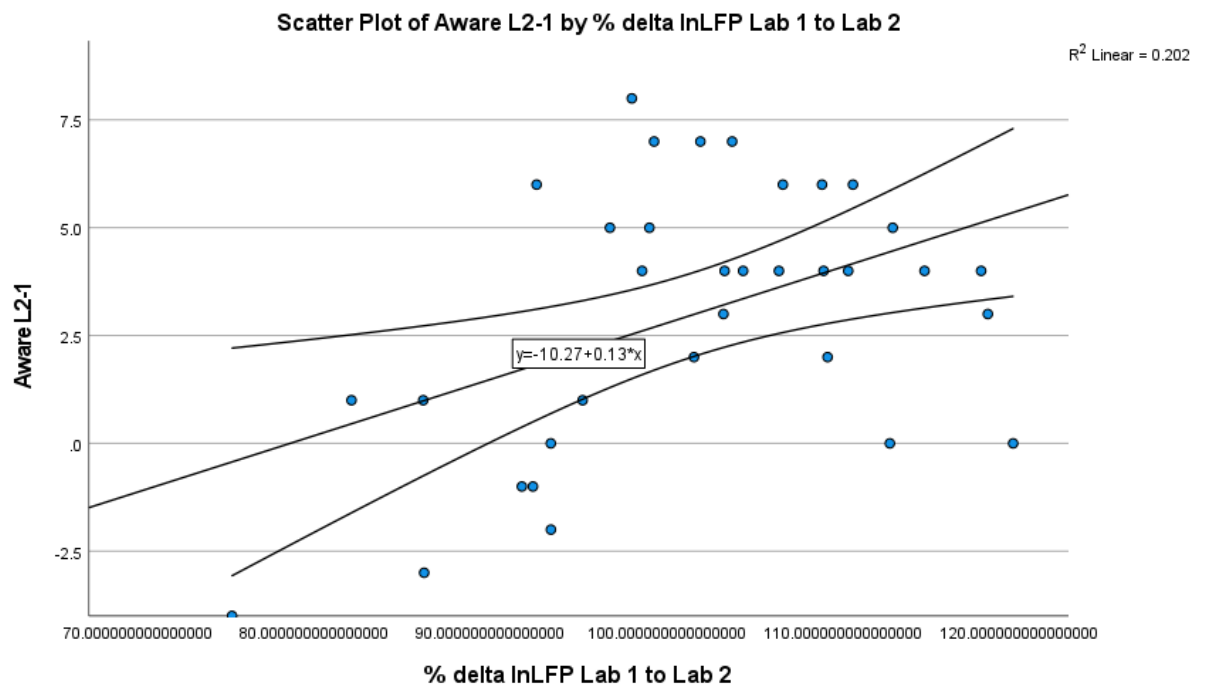
Scatter Plot of correlations between 'Observing' and lnTP post-intervention



There was a significant correlation between participants' post-intervention 'Acting with Awareness' scores and the % increase in lnLFP in their cardiac spectrograms from pre- to post-intervention ($n = 34$; $r = 0.450$, $p = 0.004$). Figure 13 illustrates the relationship between the participants' post-intervention 'Acting with Awareness' scores on the y-axis and the % change in the lnLFP in their cardiac spectrograms on the x-axis.

Figure 13

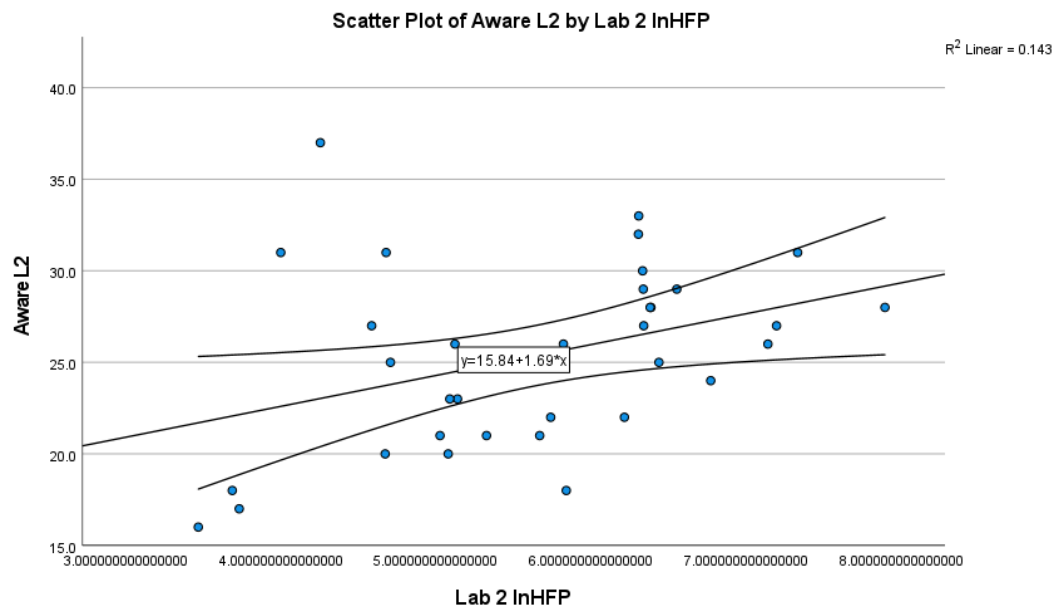
Scatter Plot of correlations between 'Acting with Awareness' and lnLFP post-intervention



Post-intervention only there was a significant correlation between the participants' 'Acting with Awareness' scores and the lnHFP in their cardiac spectrograms ($n = 34$; $r = 0.378$, $p = 0.028$). Figure 14 illustrates the post-intervention relationship between participants 'Acting with Awareness' scores on the y-axis and the lnHFP in their cardiac spectrograms on the x-axis.

Figure 14

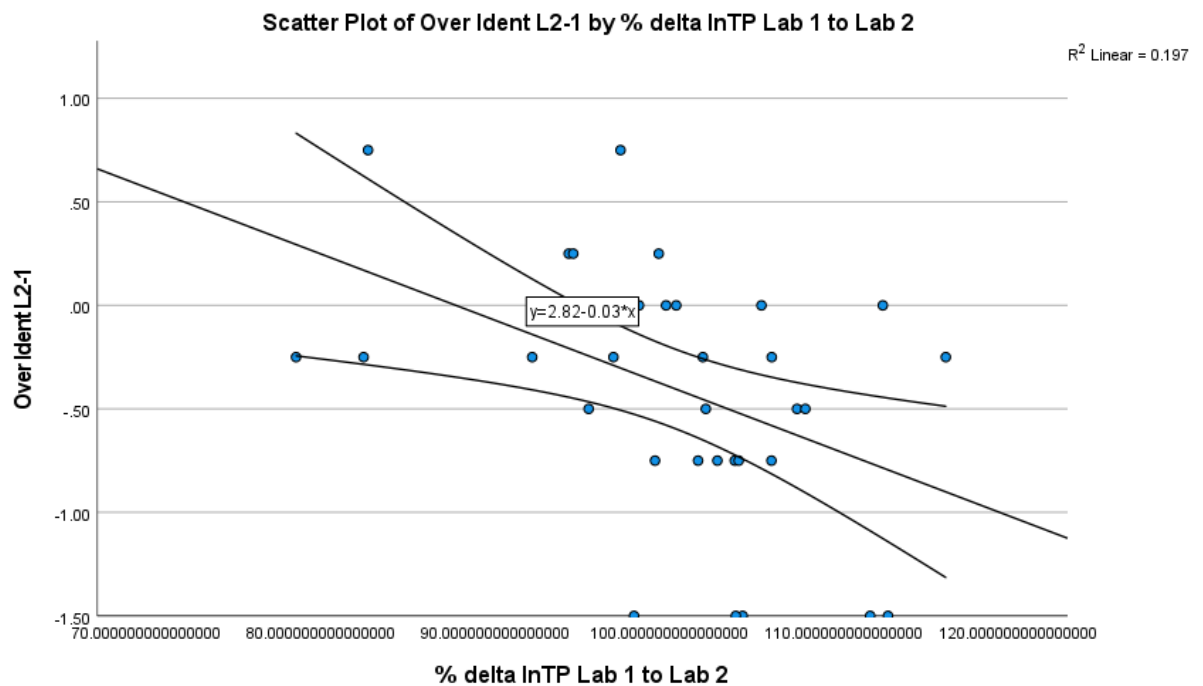
Scatter Plot of correlation between ‘Acting with Awareness’ and lnHFP post-intervention



In the SCS, there was a significant correlation between the change in participants’ ‘Over-Identification’ scores pre- versus post-intervention ($p < 0.001$) and the proportional change in the lnTP in their cardiac spectrograms from pre- to post-intervention ($n = 34$; $\rho = -0.474$, $p = 0.005$). Figure 15 illustrates the relationship between the change in participants’ ‘Over Identification’ scores from pre- to post-intervention on the y-axis and the % change in the lnTP in their cardiac spectrograms from pre- to post-intervention on the x-axis.

Figure 15

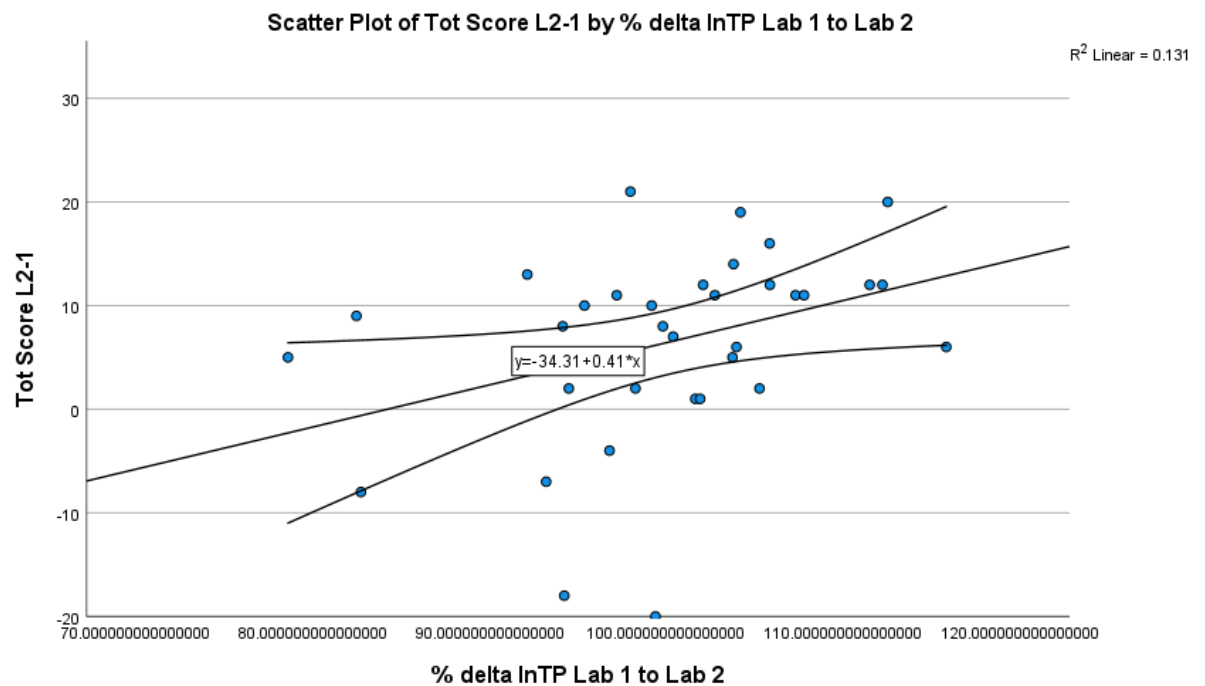
Scatter Plot of correlation between 'Over-Identification' and lnTP post-intervention



There was a significant correlation between the change in participants' 'Total Score' of the SCS from pre- to post-intervention and the % change in the lnTP in their cardiac spectrograms from pre- to post-intervention ($n = 34$; $r = 0.440$, $p = 0.009$). Figure 16 illustrates the relationship between the change in participants' 'Total Scores' from pre- to post-intervention on the y-axis and the % change in the lnTP in their cardiac spectrograms from pre- to post-intervention on the x-axis.

Figure 16

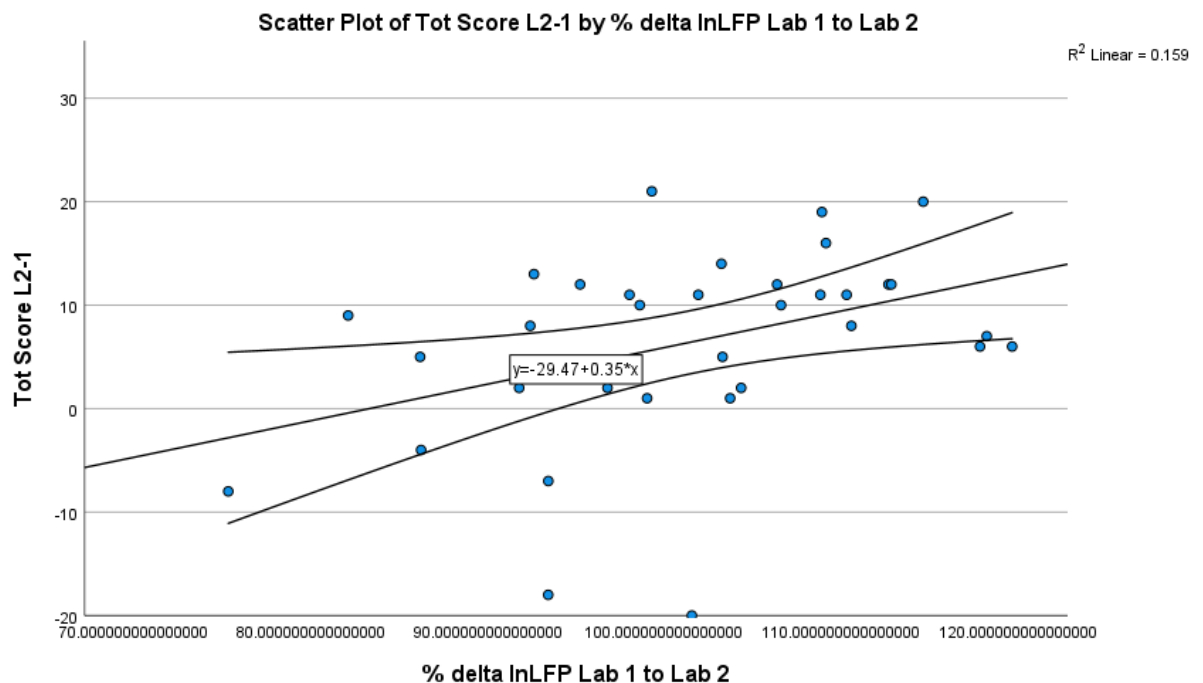
Scatter Plot of correlation between SCS 'Total Score' and lnTP post-intervention



There was a significant correlation between the change in participants' 'Total Score' of the SCS from pre- to post-intervention and the % increase in lnLFP in their cardiac spectrograms from pre- to post-intervention ($n = 34$; $r = 0.387$, $p = 0.024$). Figure 17 illustrates the relationship between the change in participants' 'Total Scores' from pre- to post-intervention on the y-axis and the % change in the lnLFP in their cardiac spectrograms from pre- to post-intervention on the x-axis.

Figure 17

Scatter Plot of correlation between SCS 'Total Score' and lnLFP post-intervention



4.2.2.4 Summary of HRV results

HRV results indicated that participants' HRV did not change during baseline from pre- to post-intervention, however, there were significant increases in HRV during the breathing exercise which carried over into the second stressful relationship conversation in the Relationship Tas . These changes were seen in both the pre- and post-intervention laboratory sessions. Additionally, important corroborative and novel correlations were found between the MAIA-2 subscales of 'Not-Worrying' and 'Trusting' and HRV and between the FFMQ subscales 'Observing' and 'Acting with Awareness', and HRV. Significant correlations were found between the changes in the SCS 'Over-Identification' scores and changes in HRV and the changes in the 'Total Score' of the SCS and changes in HRV. Together, these associations suggest IAw and ER improved at the brain-heart level.

4.3 Behavioural Results

4.3.1 Reliability Results

All measures demonstrated sufficient reliability. For the MAIA-2, Cronbach's Alpha ranged between 0.60 – .97. Most subscales were above 0.83 demonstrating good reliability. For the FFMQ, Cronbach's Alpha ranged between 0.74 – 0.97 demonstrating acceptable to excellent reliability. For the SCS, Cronbach's Alpha ranged between 0.64 – 0.94 with most scores being above 0.80 demonstrating good reliability. The STAI Cronbach's Alpha ranged between 0.88 – 0.97 with 5 of the 6 scores being above 0.90 demonstrating excellent reliability. These results are captured in Appendix V.

4.3.2 Time points 0, 1 and 2

4.3.2.1 The TBRH Intervention – Groups A&B in a waitlist design

There were no significant differences in the scores for the MAIA-2 (eight sub-scales), the FFMQ (five sub-scales) and the SCS (six sub-scales and a total score) pre-intervention (time point 0) for Groups A (the intervention group) versus B (the waitlist-control group). These results are summarised in Table 4.5.

Table 4.5

Differences between Groups A and B at time point 0

	Time point 0 - Group A (n=16)		Time point 0 - Group B (n=12)		
	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.10	1.16	3.71	0.37	.387
Not-distracting	1.60	0.90	1.61	0.89	.907
Not worrying	2.66	0.75	2.90	0.90	.455
Attention Regulation	2.41	1.09	2.73	0.77	.429
Emotional Awareness	3.80	0.89	3.95	0.74	.798
Self-Regulation	2.94	0.91	3.04	0.73	.622
Body Listening	1.73	1.06	2.31	0.93	.147
Trusting	3.19	1.09	3.17	0.82	.944

FFMQ

Observing	27.88	4.03	29.00	6.19	.362
Describing	24.13	9.78	28.75	7.25	.170
Acting with Awareness	22.50	5.49	23.58	6.01	.613
Non-judging Inner Experience	27.00	6.18	25.58	8.25	.727
Non-reactivity to Inner Experience	20.25	5.08	18.75	4.97	.328

SCS					
Self-Kindness	3.24	0.62	3.23	0.75	.988
Self-Judgement	2.93	0.97	2.88	1.04	.944
Common Humanity	3.28	0.94	3.44	0.53	.726
Isolation	2.92	1.01	2.98	0.74	.852
Mindfulness	3.41	0.80	3.15	0.60	.323
Over- Identification	2.98	0.75	3.31	1.07	.298
Total SCS score	82.69	16.92	80.92	17.86	.785
STAI-S	34.56	10.07	34.08	8.28	.981
STAI-T	36.81	10.51	40.67	13.52	.561

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 1 for groups A & B for the Theatre-Based Relational Health (TBRH) intervention.

4.3.2.2 The Breathing Only Intervention – Group C, The Retest Group

There was a significant difference for the MAIA-2 subscale ‘Body-Listening’ ($M = 2.75 \pm 0.77$ vs 1.73 ± 1.06 ; $p = 0.011$) between Group C and Group A pre-intervention (timepoint 0). There was a trend for a difference in the STAI-T ($M = 43.38 \pm 8.83$ vs $M = 36.81 \pm 10.51$, $p = 0.051$) between Group C and Group A pre-intervention (time point 0). There were no significant pre-intervention (time point 0) differences for any other questionnaire scores between Group C and Group A. These results are summarised in Table 4.6.

Table 4.6*Differences for Group A at time point 0 & Differences for Group C at time point 0*

	Time point 0 - Group A (n=16)		Time point 0 - Group C (n=13)		
	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.10	1.16	3.19	0.93	.928
Not-distracting	1.60	0.90	1.83	0.98	.613
Not worrying	2.66	0.75	2.02	0.49	.018
Attention Regulation	2.41	1.09	2.76	0.83	.428
Emotional Awareness	3.80	0.89	3.92	0.84	.723
Self-Regulation	2.94	0.91	2.98	0.73	.982
Body Listening	1.73	1.06	2.75	0.77	.011
Trusting	3.19	1.09	3.31	0.83	.566
<i>FFMQ</i>					
Observing	27.88	4.03	29.15	3.98	.354
Describing	24.13	9.78	27.46	5.53	.302
Acting with Awareness	22.50	5.49	23.31	5.23	.700
Non-judging					
Inner Experience	27.00	6.18	23.46	5.25	.159
Non-reactivity to Inner Experience	20.25	5.08	20.15	3.46	.692
<i>SCS</i>					
Self-Kindness	3.24	0.62	3.11	0.81	.632
Self-Judgement	2.93	0.97	3.42	0.88	.172
Common Humanity	3.28	0.94	3.35	0.93	.930
Isolation	2.92	1.01	2.94	0.99	1.000
Mindfulness	3.41	0.80	3.27	0.68	.707

Over- Identification	2.98	0.75	3.37	0.58	.217
Total SCS score	82.69	16.92	77.69	15.82	.433
STAI-S	34.56	10.07	38.00	9.78	.345
STAI-T	36.81	10.51	43.38	8.83	.051

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 0 for Group C for the Breathing Only Intervention vs Group A for the Theatre-Based Relational Health (TBRH) intervention. *Significant increase with intervention.

There was a significant difference for the MAIA-2 subscale, ‘Not Worrying’ ($M = 2.02 \pm 0.49$ vs $M = 2.90 \pm 0.90$; $p = 0.018$) between Group C and Group B pre-intervention (time point 0). There were no significant differences for any other questionnaire scores between Group C and Group B pre-intervention (time point 0). These results are summarised in Table 4.7.

Table 4.7

Differences for Group B and time point 0 & Differences for Group C at time point 0

Lab	Time point 0 - Group B (n=12)		Time point 0 - Group C (n=13)		<i>p</i> -
	M	SD	M	SD	
<i>MAIA-2</i>					
Noticing	3.71	0.37	3.19	0.93	.178
Not-distracting	1.61	0.89	1.83	0.98	.623
Not worrying	2.90	0.90	2.02	0.49	.018*
Attention Regulation	2.73	0.77	2.76	0.83	.848
Emotional Awareness	3.95	0.74	3.92	0.84	.870
Self-Regulation	3.04	0.73	2.98	0.73	.621
Body Listening	2.31	0.93	2.75	0.77	.230
Trusting	3.17	0.82	3.31	0.83	.582

<i>FFMQ</i>					
Observing	29.00	6.19	29.15	3.98	.806
Describing	28.75	7.25	27.46	5.53	.445
Acting with Awareness	23.58	6.01	23.31	5.23	.902
Non-judging Inner Experience	25.58	8.25	23.46	5.25	.495
Non-reactivity to Inner Experience	18.75	4.97	20.15	3.46	.478
<i>SCS</i>					
Self-Kindness	3.23	0.75	3.11	0.81	.666
Self-Judgement	2.88	1.04	3.42	0.88	.240
Common Humanity	3.44	0.53	3.35	0.93	.784
Isolation	2.98	0.74	2.94	0.99	.891
Mindfulness	3.15	0.60	3.27	0.68	.562
Over- Identification	3.31	1.07	3.37	0.58	.872
Total SCS score	80.92	17.86	77.69	15.82	.636
STAI-S	34.08	8.28	38.00	9.78	.383
STAI-T	40.67	13.52	43.38	8.83	.413

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 0 for Group C for the Breathing Only Intervention vs Group B for the Theatre-Based Relational Health (TBRH) intervention.

4.3.3 Differences between groups across time

4.3.3.1 The TBRH Intervention – Groups A&B in a waitlist design

At time point 1, the subscale ‘Self-Regulation’ ($M = 3.87 \pm 0.52$ vs $M = 3.40 \pm 0.59$, $p = 0.036$) in the MAIA-2 and ‘Non-Reactivity to Inner Experience’ ($M = 22.40 \pm 4.03$ vs $M = 19.25 \pm 2.70$, $p = 0.009$) in the FFMQ for Group A who had received the TBRH intervention was significantly higher than it was for Group B who had not yet received the intervention. While the ‘Trusting’ score for Group A was higher than it was for Group B ($M = 3.98 \pm 0.71$ versus $M = 3.42 \pm 0.55$) at time point 1 in the MAIA-2, this was non-significant ($p = 0.057$). There were no significant group differences for any other questionnaire scores at time point 1.

At time point 2, when Group B had also received the TBRH intervention, there were no differences in questionnaire scores between Groups A and B. Please refer to Tables 4.8 and 4.9.

Table 4.8

Differences between Groups A and B at time point 1

	Timepoint 1 - Group A (n=15)		Timepoint 1 - Group B (n=12)		
Lab	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.46	0.81	3.67	0.59	.585
Not-distracting	2.06	0.92	1.78	0.88	.314
Not worrying	3.11	0.68	2.80	0.75	.289
Attention Regulation	3.10	0.63	3.07	0.68	1.000
Emotional Awareness	3.83	0.64	4.02	0.60	.303
Self-Regulation	3.87	0.52	3.40	0.59	.036*
Body Listening	2.93	0.83	2.86	0.77	.961
Trusting	3.98	0.71	3.42	0.55	.057
<i>FFMQ</i>					
Observing	29.13	4.34	29.67	4.58	.572
Describing	26.13	8.68	29.25	6.37	.251
Acting with Awareness	24.87	4.53	24.50	6.86	.860
Non-judging Inner Experience	28.53	7.49	24.58	8.33	.272
Non-reactivity to Inner Experience	22.40	4.03	19.25	2.70	.009**
<i>SCS</i>					
Self-Kindness	3.32	0.68	3.40	0.84	.796
Self-Judgement	2.85	0.85	2.85	0.96	.896
Common Humanity	3.37	0.84	3.02	0.89	.447

Isolation	2.77	0.95	2.59	0.68	.937
Mindfulness	3.57	0.59	3.50	0.63	.544
Over-Identification	2.77	0.76	3.07	0.90	.320
Total SCS score	85.93	16.10	84.18	17.88	.794
STAI-S	30.93	9.00	36.11	13.75	.478
STAI-T	35.93	11.27	39.27	12.06	.550

*p<0.05, **p<0.01, ***p<0.00

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 1 for groups A & B for the Theatre-Based Relational Health (TBRH) intervention. *Significant increase with intervention.

Table 4.9

Difference between Groups A and B at time point 2

	Timepoint 2 - Group A (n=15)		Timepoint 2 - Group B (n=12)		
Lab	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.65	0.77	3.88	0.38	.586
Not-distracting	2.42	1.05	2.10	0.85	.525
Not worrying	2.89	1.05	2.98	0.96	1.000
Attention Regulation	3.19	0.78	3.39	0.46	.523
Emotional Awareness	4.05	0.61	4.27	0.51	.337
Self-Regulation	3.82	0.50	3.77	0.41	.882
Body Listening	2.98	1.06	3.36	0.59	.444
Trusting	4.04	0.90	3.58	0.55	.116
<i>FFMQ</i>					
Observing	30.27	5.35	30.83	5.17	.845
Describing	27.13	9.27	30.42	6.23	.327
Acting with Awareness	25.60	5.73	27.17	6.25	.514

Non-judging Inner Experience	29.33	9.01	26.92	7.76	.448
Non-reactivity to Inner Experience	22.60	4.34	21.25	3.17	.211
SCS					
Self-Kindness	3.49	0.83	3.52	0.70	.939
Self-Judgement	2.69	0.93	2.70	0.96	.980
Common Humanity	3.38	0.97	3.63	0.73	.693
Isolation	2.48	1.02	2.73	0.78	.376
Mindfulness	3.63	0.65	3.44	0.60	.588
Over-Identification	2.53	0.90	2.83	1.03	.427
Total SCS score	90.00	18.12	88.08	16.97	.781
STAI-S	31.73	11.25	28.25	8.48	.366
STAI-T	35.33	13.26	37.50	13.06	.807

*p<0.05, **p<0.01, ***p<0.00

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 2 for groups A & B for the Theatre-Based Relational Health (TBRH) intervention.

*Significant increase with intervention

4.3.3.2 The Breathing Only Intervention – Group C, The Retest Group

At time point 1, there was a significant difference between Group C and Group A for ‘Not-Worrying’ ($M = 2.38 \pm 0.61$ vs $M = 3.11 \pm 0.68$, $p = 0.008$) and ‘Emotional Awareness’ ($M = 3.83 \pm 0.64$ vs $M = 4.26 \pm 0.55$, $p = 0.030$). Please refer to Table 4.10.

Table 4.10

Differences at time point 1 between Group A and C

	Timepoint 1 - Group A (n=15)		Timepoint 1 - Group C (n=13)		
Lab	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.46	0.81	3.71	0.65	.403
Not-distracting	2.06	0.92	2.17	0.87	.752
Not worrying	3.11	0.68	2.38	0.61	.008**
Attention Regulation	3.10	0.63	3.47	0.37	.138
Emotional Awareness	3.83	0.64	4.26	0.55	.030*
Self-Regulation	3.87	0.52	3.88	0.40	.962
Body Listening	2.93	0.83	3.41	0.82	.130
Trusting	3.98	0.71	3.79	0.98	.814
<i>FFMQ</i>					
Observing	29.13	4.34	30.77	4.88	.562
Describing	26.13	8.68	28.69	5.44	.406
Acting with Awareness	24.87	4.53	25.69	4.57	.636
Non-judging Inner Experience	28.53	7.49	28.23	5.20	.926
Non-reactivity to Inner Experience	22.40	4.03	21.31	2.02	.099
<i>SCS</i>					
Self-Kindness	3.32	0.68	3.42	0.81	.742

Self-Judgement	2.85	0.85	2.89	0.71	.799
Common Humanity	3.37	0.84	3.56	0.68	.659
Isolation	2.77	0.95	2.71	0.93	.963
Mindfulness	3.57	0.59	3.48	0.72	.545
Over-Identification	2.77	0.76	2.94	0.61	.502
Total SCS score	85.93	16.10	86.15	16.47	.972
STAI-S	30.93	9.00	30.69	9.33	.926
STAI-T	35.93	11.27	38.69	10.16	.279

*p<0.05, **p<0.01, ***p<0.00

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 1 for group A for the Theatre-Based Relational Health (TBRH) intervention and timepoint 1 for Group C for the Breathing Only Intervention. *Significant increase with intervention

At time point 2 for Group B and time point 1 for Group C, when both groups were post-intervention, there were no significant differences between them for any of the questionnaire scores. Please refer to Table 4.11.

Table 4.11

Differences for Group B at time point 2 and Group C at time point 1

	Timepoint 2 - Group B (n=12)		Timepoint 1 - Group C (n=13)		
Lab	M	SD	M	SD	<i>p</i>
<i>MAIA-2</i>					
Noticing	3.88	0.38	3.71	0.65	.956
Not-distracting	2.10	0.85	2.17	0.87	.743
Not worrying	2.98	0.96	2.38	0.61	.107
Attention					
Regulation	3.39	0.46	3.47	0.37	.847
Emotional					
Awareness	4.27	0.51	4.26	0.55	.759
Self-					
Regulation	3.77	0.41	3.88	0.40	.594
Body					
Listening	3.36	0.59	3.41	0.82	.740

Trusting	3.58	0.55	3.79	0.98	.400
<i>FFMQ</i>					
Observing	30.83	5.17	30.77	4.88	.978
Describing	30.42	6.23	28.69	5.44	.353
Acting with					
Awareness	27.17	6.25	25.69	4.57	.511
Non-judging					
Inner					
Experience	26.92	7.76	28.23	5.20	.827
Non-reactivity					
to Inner					
Experience	21.25	3.17	21.31	2.02	.868
<i>SCS</i>					
Self-Kindness	3.52	0.70	3.42	0.81	.741
Self-					
Judgement	2.70	0.96	2.89	0.71	.682
Common					
Humanity	3.63	0.73	3.56	0.68	.411
Isolation	2.73	0.78	2.71	0.93	.891
Mindfulness	3.44	0.60	3.48	0.72	.956
Over-					
Identification	2.83	1.03	2.94	0.61	.753
Total SCS					
score	88.08	16.97	86.15	16.47	.776
STAI-S	28.25	8.48	30.69	9.33	.478
STAI-T	37.50	13.06	38.69	10.16	.446

*p<0.05, **p<0.01, ***p<0.00

Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) for the difference at time point 2 for group B for the Theatre-Based Relational Health (TBRH) intervention and timepoint 1 for Group C for the Breathing Only Intervention. *Significant increase with intervention

4.3.3 Within-group changes across time

4.3.4.1 The TBRH Intervention – Groups A&B in a waitlist design

Repeated-measures ANOVA and more specifically Friedman ANOVA for Groups A and B showed that the TBRH intervention had a significant group-by-time effect for variables in the MAIA-2 and the SCS. However, the more refined paired t-tests and Wilcoxon tests did not demonstrate this overarching significance. The results for the Repeated Measures ANOVA (rmANOVA) and the Friedman ANOVA analysis are captured in the Tables 4.14 and 4.15 below.

Table 4.14

Differences within Group A

	rmANOVA p-value	ANOVA-FRIEDMAN p-value
<i>MAIA-2</i>		
Noticing		0.020*
Not-distracting		0,016
Not worrying		0.150
Attention Regulation		0.068
Emotional Awareness		0.077
Self-Regulation		0.042*
Body Listening		0.002**
Trusting		0.007**
<i>FFMQ</i>		
Observing		0.099
Describing		0.019*
Acting with Awareness	0,000*	***
Non-judging Inner Experience		0.278

Non-reactivity to Inner Experience		0.404
SCS		
Self-Kindness	0.197	
Self-Judgement		0.019*
Common Humanity		0.923
Isolation		0.007**
Mindfulness		0.348
Over-Identification	0.010*	**
Total SCS score	0.009*	**
STAI-S		0.013*
STAI-T		0.431

*p<0.05, **p<0.01, ***p<0.00

Group A – rmANOVA and ANOVA-Friedman Within Group Changes Group A for the Theatre-Based Relational Health (TBRH) intervention. Multidimensional Interoceptive Awareness Scale (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI)

*Significant increase with intervention.

Table 4.15

Differences within Group B

	rmANOVA p-value	ANOVA-FRIEDMAN p-value
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<i>MAIA-2</i>		
Noticing		0.328
Not-distracting		0.034*
Not worrying		0.909
Attention Regulation		0.028*
Emotional Awareness		0.040*
Self-Regulation		0.010**
Body Listening		0.004**
Trusting		0.042*
<i>FFMQ</i>		
Observing		0.247
Describing		0.205
Acting with Awareness	0.001*	**
Non-judging Inner Experience		0.836
Non-reactivity to Inner Experience		0.173
<i>SCS</i>		
Self-Kindness	0.287	
Self-Judgement		0.412
Common Humanity		0.028*
Isolation		0.027*
Mindfulness		0.053^
Over-Identification	0.023*	*
Total SCS score	0.027*	*
<i>STAI-S</i>		0.052^

** $p < 0.01$, *** $p < 0.001$

Group B – rmANOVA and ANOVA-Friedman Within Group Changes Group B for the Theatre-Based Relational Health (TBRH) intervention. Multidimensional Interoceptive Awareness Scale (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI)

*Significant increase with intervention.

For Group A, there was a significant difference between time point 0 and time point 1 for the subscales of ‘Self-Regulation’ ($p = 0.005$) and ‘Body-Listening’ ($p = 0.014$) in the MAIA-2, and for the ‘Acting with Awareness’ ($p = 0.006$) subscale in the FFMQ. From time point 1 to time point 2, there was a significant increase in the total SCS score ($p = 0.039$). From time point 0 to time point 2, the MAIA-2 subscales of ‘Self-Regulation’ ($p = 0.005$) and ‘Body-Listening’ ($p = 0.014$) held their significance. There was a trend for an increase in ‘Trusting’ (3.19 ± 1.09 vs 4.04 ± 0.90 , $p = 0.059$) from time point 0 to time point 2. For the FFMQ, ‘Observing’ ($p = 0.039$) moves into being significantly higher at time point 2 versus time point 0 and ‘Acting with Awareness’ ($p = 0.001$) strengthens further in significance. For the SCS, the decrease in the subscale of ‘Over-Identification’ ($p = 0.006$) became significant, and there was a further increase in significance for the total SCS score ($p = 0.007$). The significant differences over time were both enduring and growing. Please refer to Table 4.12.

For Group B there were no differences between time point 0 and time point 1 for any of the questionnaires. There were significant differences between time point 1 and time point 2 for The FFMQ subscale, ‘Acting with Awareness’ ($p = 0.006$), and for the SCS subscale ‘Over-Identification’ ($p = 0.029$). There was no significant change for the MAIA-2. There were significant differences between time point 0 and time point 2 for the MAIA-2 subscales ‘Self-Regulation’ ($p = 0.014$) and ‘Body-Listening’ ($p = 0.019$) and for the total SCS score ($p = 0.006$). There was a further increase in significance for the FFMQ subscale, ‘Acting with Awareness’ ($p = 0.001$). The SCS subscale, ‘Over Identification’ ($p = 0.037$), remained significantly different. Please refer to Table 10.

Table 4.12*Within Group Change for Group A*

Lab	Time point 0 vs Time point 1					Time point 1 vs Time point 2					Time point 0 vs Time point 2				
	T0		T1		p	T1		T2		p	T0		T2		p
	(n=16)		(n=15)			(n=15)		(n=15)			(n=16)		(n=15)		
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD	
MAIA-2															
Noticing	3.10	1.16	3.46	0.81	.850	3.46	0.81	3.65	0.77	.850	3.10	1.16	3.65	0.77	.609
Not-distracting	1.60	0.90	2.06	0.92	.421	2.06	0.92	2.42	1.05	.421	1.60	0.90	2.42	1.05	.128
Not worrying	2.66	0.75	3.11	0.68	.259	3.11	0.68	2.89	1.05	.843	2.66	0.75	2.89	1.05	.480
Attention Regulation	2.41	1.09	3.10	0.63	.097	3.10	0.63	3.19	0.78	.787	2.41	1.09	3.19	0.78	.097
Emotional Awareness	3.80	0.89	3.83	0.64	1.000	3.83	0.64	4.05	0.61	1.000	3.80	0.89	4.05	0.61	1.00
Self-Regulation	2.94	0.91	3.87	0.52	.005**	3.87	0.52	3.82	0.50	.737	2.94	0.91	3.82	0.50	.005**
Body Listening	1.73	1.06	2.93	0.83	.014*	2.93	0.83	2.98	1.06	.983	1.73	1.06	2.98	1.06	.014*
Trusting	3.19	1.09	3.98	0.71	.059	3.98	0.71	4.04	0.90	.627	3.19	1.09	4.04	0.90	.059
FFMQ															
Observing	27.88	4.03	29.13	4.34	.852	29.13	4.34	30.27	5.35	.852	27.88	4.03	30.27	5.35	.039*
Describing	24.13	9.78	26.13	8.68	1.000	26.13	8.68	27.13	9.27	1.000	24.13	9.78	27.13	9.27	1.00
Acting with Awareness	22.50	5.49	24.87	4.53	.006**	24.87	4.53	25.60	5.73	.430	22.50	5.49	25.60	5.73	.000*
Non-judging Inner Experience	27.00	6.18	28.53	7.49	1.000	28.53	7.49	29.33	9.01	1.000	27.00	6.18	29.33	9.01	1.00

Non-reactivity to Inner Experience	20.25	5.08	22.40	4.03	.529	22.40	4.03	22.60	4.34	.559	20.25	5.08	22.60	4.34	.529
SCS															
Self-Kindness	3.24	0.62	3.32	0.68	.589	3.32	0.68	3.49	0.83	.191	3.24	0.62	3.49	0.83	.076
Self-Judgement	2.93	0.97	2.85	0.85	1.00	2.85	0.85	2.69	0.93	1.00	2.93	0.97	2.69	0.93	1.00
Common Humanity	3.28	0.94	3.37	0.84	1.00	3.37	0.84	3.38	0.97	1.00	3.28	0.94	3.38	0.97	1.00
Isolation	2.92	1.01	2.77	0.95	.671	2.77	0.95	2.48	1.02	.671	2.92	1.01	2.48	1.02	.363
Mindfulness	3.41	0.80	3.57	0.59	.927	3.57	0.59	3.63	0.65	.927	3.41	0.80	3.63	0.65	.927
Over-Identification	2.98	0.75	2.77	0.76	.070	2.77	0.76	2.53	0.90	.182	2.98	0.75	2.53	0.90	.006
Total SCS score	82.69	16.92	85.93	16.10	.156	85.93	16.10	90.00	18.12	.039	82.69	16.92	90.00	18.12	.007
STAI-S	34.56	10.07	30.93	9.00	.705	30.93	9.00	31.73	11.25	.950	34.56	10.07	31.73	11.25	.705
STAI-T	36.81	10.51	35.93	11.27	1.00	35.93	11.27	35.33	13.26	1.00	36.81	10.51	35.33	13.26	1.00

*p<0.05, **p<0.01, ***p<0.00

Group A – Within Group Changes at Timepoint for the T0 vs. T2, T0. Vs T1 & T1. Vs T2. Theatre-Based Relational Health (TBRH) intervention. Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) *Significant increase with intervention.

Table 4.13*Within Group Changes for Group B*

Lab	Time point 0 vs Time point 1					Time point 1 vs Time point 2					Time point 0 vs Time point 2				
	T0		T1		<i>p</i>	T1		T2		<i>p</i>	T0		T2		<i>p</i>
	(n=12)		(n=12)			(n=12)		(n=12)			(n=12)		(n=12)		
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD	
<i>MAIA-2</i>															
Noticing	3.71	0.37	3.67	0.59	1.00	3.67	0.59	3.88	0.38	1.00	3.71	0.37	3.88	0.38	1.00
Not-distracting	1.61	0.89	1.78	0.88	.465	1.78	0.88	2.10	0.85	.446	1.61	0.89	2.10	0.85	.245
Not worrying	2.90	0.90	2.80	0.75	1.00	2.80	0.75	2.98	0.96	1.00	2.90	0.90	2.98	0.96	1.00
Attention															
Regulation	2.73	0.77	3.07	0.68	.470	3.07	0.68	3.39	0.46	.470	2.73	0.77	3.39	0.46	.082
Emotional															
Awareness	3.95	0.74	4.02	0.60	1.00	4.02	0.60	4.27	0.51	1.00	3.95	0.74	4.27	0.51	1.000
Self-Regulation	3.04	0.73	3.40	0.59	.558	3.40	0.59	3.77	0.41	.113	3.04	0.73	3.77	0.41	.014*
Body Listening	2.31	0.93	2.86	0.77	.149	2.86	0.77	3.36	0.59	.149	2.31	0.93	3.36	0.59	.019*
Trusting	3.17	0.82	3.42	0.55	1.00	3.42	0.55	3.58	0.55	1.00	3.17	0.82	3.58	0.55	.790
<i>FFMQ</i>															
Observing	29.00	6.19	29.67	4.58	1.00	29.67	4.58	30.83	5.17	1.00	29.00	6.19	30.83	5.17	1.00
Describing	28.75	7.25	29.25	6.37	1.00	29.25	6.37	30.42	6.23	1.00	28.75	7.25	30.42	6.23	1.00
Acting with															
Awareness	23.58	6.01	24.50	6.86	.339	24.50	6.86	27.17	6.25	.006**	23.58	6.01	27.17	6.25	.001***
Non-judging Inner															
Experience	25.58	8.25	24.58	8.33	1.00	24.58	8.33	26.92	7.76	1.00	25.58	8.25	26.92	7.76	1.00
Non-reactivity to															
Inner Experience	18.75	4.97	19.25	2.70	.727	19.25	2.70	21.25	3.17	.143	18.75	4.97	21.25	3.17	.278
<i>SCS</i>															
Self-Kindness	3.23	0.75	3.40	0.84	.269	3.40	0.84	3.52	0.70	.525	3.23	0.75	3.52	0.70	.068

Self-Judgement	2.88	1.04	2.85	0.96	1.00	2.85	0.96	2.70	0.96	1.00	2.88	1.04	2.70	0.96	1.00
Common															
Humanity	3.44	0.53	3.02	0.89	.555	3.02	0.89	3.63	0.73	.248	3.44	0.53	3.63	0.73	.555
Isolation	2.98	0.74	2.59	0.68	.793	2.59	0.68	2.73	0.78	.793	2.98	0.74	2.73	0.78	.793
Mindfulness	3.15	0.60	3.50	0.63	.603	3.50	0.63	3.44	0.60	.975	3.15	0.60	3.44	0.60	.603
Over-															
Identification	3.31	1.07	3.07	0.90	.410	3.07	0.90	2.83	1.03	.029*	3.31	1.07	2.83	1.03	.037
Total SCS score	80.92	17.86	84.18	17.88	.485	84.18	17.88	88.08	16.97	.106	80.92	17.86	88.08	16.97	.006
STAI-S	34.08	8.28	36.11	13.75	1.00	36.11	13.75	28.25	8.48	.314	34.08	8.28	28.25	8.48	.180
STAI-T	40.67	13.52	39.27	12.06	1.00	39.27	12.06	37.50	13.06	1.00	40.67	13.52	37.50	13.06	1.00

*p<0.05, **p<0.01, ***p<0.00

Group B – Within Group Changes at Timepoint for the T0 vs. T2, T0. Vs T1 & T1. Vs T2. Theatre-Based Relational Health (TBRH) intervention. Multidimensional Assessment of Interoceptive Awareness (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI) *Significant increase with intervention.

4.3.4.2 The Breathing Only Intervention – Group C, The Retest Group

For Group C, there was a significant time effect between time point 0 versus time point 1 showing a significant increase in the MAIA-2 subscales ‘Attention Regulation’ ($p = 0.027$), ‘Self-Regulation’ ($p = 0.001$) and ‘Body Listening’ ($p = 0.032$). The FFMQ had a time effect for the subscale, ‘Non-Judgement to Inner Experience’ ($p = 0.029$) and the SCS showed a strong significant decrease in the subscale, ‘Over-Identification’ ($p = 0.017$) and a strong increase for the total SCS score ($p = 0.001$). Notably, Group C, who presented a strong tendency toward trait anxiety at time point 0 ($p = 0.051$), had a significant decrease in state anxiety ($p = 0.037$) post-intervention. Please refer to Table 4.16.

Table 4.16

Within Group changes for Group C

	Time point 0 vs Time point 1				
	T0		T1		<i>p</i>
	(n=13)		(n=13)		
	M	SD	M	SD	
<i>MAIA-2</i>					
Noticing	3.19	0.93	3.71	0.65	.122
Not-distracting	1.83	0.98	2.17	0.87	.368
Not worrying	2.02	0.49	2.38	0.61	.829
Attention Regulation	2.76	0.83	3.47	0.37	.027*
Emotional Awareness	3.92	0.84	4.26	0.55	.351
Self-Regulation	2.98	0.73	3.88	0.40	.001**
Body Listening	2.75	0.77	3.41	0.82	.032*
Trusting	3.31	0.83	3.79	0.98	.202
<i>FFMQ</i>					
Observing	29.15	3.98	30.77	4.88	.381
Describing	27.46	5.53	28.69	5.44	.572
Acting with Awareness	23.31	5.23	25.69	4.57	.139
Non-judging Inner Experience	23.46	5.25	28.23	5.20	.029*

Non-reactivity to Inner Experience	20.15	3.46	21.31	2.02	.452
SCS					
Self-Kindness	3.11	0.81	3.42	0.81	.134
Self-Judgement	3.42	0.88	2.89	0.71	.090
Common Humanity	3.35	0.93	3.56	0.68	.623
Isolation	2.94	0.99	2.71	0.93	.439
Mindfulness	3.27	0.68	3.48	0.72	.378
Over-Identification	3.37	0.58	2.94	0.61	.017*
Total SCS score	77.69	15.82	86.15	16.47	.000***
STAI-S	38.00	9.78	30.69	9.33	.037*
STAI-T	43.38	8.83	38.69	10.16	.208

*p<0.05, **p<0.01, ***p<0.001

Group C – Within Group Changes at time point for the T1 vs. T3, T1. Vs T2 & T2. Vs T3. Breathing Only intervention.

Multidimensional Interoceptive Awareness Scale (MAIA-2), Five Facet Mindfulness Scale (FFMQ), Self-Compassion Scale (SCS) and State-Trait Anxiety Inventory for Adults (STAI). *Significant increase with intervention.

4.3.4.3 Summary

These results show that participants in the both Groups A and B of the waitlist design, improved in the subscales of the MAIA-2, FFMQ, and SCS, indexing potential growth in IAw and ER. The groups were the same at baseline (time point 0). At timepoint 1, after group A had received the intervention, they showed improved IAw, ER, and self-compassion in comparison to Group B. Once Group B had received the intervention, the group's results were similar potentially indicating homogeneity of the TBRH intervention. The results further suggest that Group C, the Breathing Only group, also improved in IAw and ER on the subscales of the MAIA-2, FFMQ and SCS. Results were similar to Groups A and B with some differences including a significant decrease in anxiety as measured through the STAI.

4.3.5 Qualitative Findings

This study aims to present findings to the research question: How did participants experience the Theatre-Based Relational Health intervention (TBRH)? The study employed a realist thematic analysis of the interview data (Braun & Clarke, 2013; Terry et al., 2017; Willig & Rogers, 2017). Five themes were identified within the data: 1) “Understanding my own triggers”: Cognitive self-awareness amidst triggers, 2) “It's part of who I am”: Arriving at self-acceptance, 3) “The things that I need in order to keep myself balanced”: Valuing self-care, 4) “Doing it calms me”: using the GNLBE to improve relationships, and 5) “I could relate to everything”: the group as a support system.

Within these findings are the participants’ accounts of their development of cognitive self-awareness amidst their triggers through becoming aware of their contradictory parts of self, together with understanding the origins of their behaviour. This self-understanding progressed to self-acceptance. In articulating the process of arriving at self-acceptance, participants shared that understanding and subsequently developing self-compassion for their negative attributes, as well as growing a kinder attitude and response to these parts, resulted in self-compassion. Additionally, this self-compassion enabled compassion for the imperfections of others. Valuing self-care became important for the participants through the intervention; as self-appreciation and self-acceptance grew, so did the prioritisation of their own self-care. This approach to valuing self-care had a regulatory impact on themselves and consequently a positive impact on their relationships. This enabled them to better navigate conflict in their relationships. Physiological awareness through the Golden Nugget Listening Breathing (GNLBE) exercise formed a key component of regulation within relationships. It taught participants to become aware of their body sensations and their link to their emotions, bringing about more connection to their inner world. Participants felt calm and supported after doing the GNLBE which led to improved listening and communication with significant others. The GNLBE provided support in navigating conflict. Finally, participants highlighted the group format as contributing significantly to their journey of embracing their vulnerabilities and having the courage to delve and reflect deeply within themselves and their relationships. The themes are presented in more depth in the analysis that follows.

4.3.5.1 “Understanding my own triggers”: Cognitive self-awareness amidst triggers

Participants described their experience of learning to recognise their emotional triggers through the TBRH intervention and developing cognitive self-awareness amidst their triggers within their personal and professional relationships. The TBRH intervention defines triggers as strong negative emotions that overwhelm an individual and lead to their having unconscious and involuntary responses and reactions. Through the TBRH intervention, participants shared their growth in their perception of their triggers. All the participants cited the exercise ‘Character Analysis 1’ in week 2 of the TBRH intervention as a key component to enhancing cognitive self-awareness amidst their triggers. This exercise explores different and contradictory parts of the self, as well as the context and dynamics that trigger each part into being and the activities that soothe and regulate each part. All of the participants shared their experience of developing cognitive self-awareness of their triggers through creating visual and tactile characters for their differing parts as seminal to become self-aware:

[T]he temper was [the character] Joe [...] it comes into play when um, like especially when I don't have sleep, when I feel a bit stressed and, it's, I battle to deal with conflict, especially with people close to me.[...] [My temper] still flares up from time to time but I do believe that it's a lot more under control, and not just that but if those characters should come out of balance there are practical solutions I can take to quickly diffuse a situation”.

(Participant 8; 52 years old; male)

“Mrs like Happy-Go-Lucky so I'm always seen as a very positive person ... but that's quite, it hangs quite heavy on your shoulders ... the opposite of that is really like the more, very insecure person. Doesn't deal well with criticism and doesn't do, um deal well with um being in a negative situation”.

(Participant 21; 35 years old; male)

“I did like a prickly pear. ... so that's where that whole thing of ja, ... you know when someone says something, just not be defensive. Which I am. And that's been enormous to recognize that and not be so defensive”.

(Participant 27, 58 years old; female)

“I did have one little character, you could almost describe him as my ball and chain and the person who holds you back from things, the character who embodies procrastination... “[W]ell here's the challenge dude. Are you going to rise to it or are you going to be, you know, the ball and chain?” [Participant 13 confronting the character]”

(Participant 13; 46 years old; male)

The participant quotes above cumulatively speak to the power of creating characters to become more aware of the context and dynamics that activate one's triggers as well as how these triggers show up in day-to-day life. The first quote illustrates the way in which Participant 8 was deeply affected by his temper and had joined the programme because of it. He used language, such as, *“mind-blowing experience”* to describe his journey of recovery from having lost his temper from *“literally days to recover”* to *“a matter of hours”*. He furthermore reflected on learning to control his temper, understanding why it was showing up, and the steps he needed to take to combat it. Referring to his temper character as ‘Joe’, he described how the intervention helped him to become aware of triggering situational factors – such as lack of sleep and stress – and offered strategies to *“diffuse the situation”*. Participant 21 discovered that her *“Happy-Go-Lucky”* part of self was compensating for a *“very insecure person”*. In the interview she shared how her mother was highly critical and through the ‘Character Analysis 1’ exercise, she had realized that she had absorbed this self-criticism *“always wanting to be perfect”* and that owing to her need to project positivity and confidence, she was not only critical of herself but of those closest to her. Participant 27 described a part of herself that she did not like as *“a prickly pear”*. In being able to view this part of herself metaphorically, it removed the shame of it for her, and she was able to engage with her behaviour from a cognitive rather than emotional perspective. She recounted how subsequently her defensiveness had reduced greatly with her daughter and with some close friends. Participant 13 described how naming the part of himself that held him back from completing important but difficult tasks, helped him to challenge his procrastination and release his “ball and chain” character. Much like Participant 8, Participant 13 speaks to the value of naming and personifying the triggered character, as well as the value of becoming cognitively self-aware of how these behaviours manifested and the intricate internal mechanisms behind their maintenance. Furthermore, these participants recounted their

experiences of how this awareness helped them to shift their behaviour in real-time, downregulating their triggers and leading to positive outcomes in their relationships.

In discussing their experience of their growing cognitive self-awareness amidst triggers, most of the participants also attributed the “Relationship Patterning & Triggers” exercise from week three of the TBRH intervention as instrumental in this development. In this exercise they explored three early caregiver dynamics and how these impacted their physiology and corresponding emotions and thoughts:

“I identified some of the root causes, [...] some of the reasons why I have traits that I'm not particularly fond of and relating to my early caregivers. ... it has given me [...] a different way to think about them...”.

(Participant 13; 46 years old; male)

“My dad was in the army and he was quite strict, very disciplined um, [...] I think I grew up with that mindset of that is how it should be, very rigid [...] I just decided okay I'm going to sleep more and I actually felt better during the day”.

(Participant 6; 43 years old; female)

“[I]t was quite interesting for me um to realise that there are these different parts of me that I didn't know existed. And when I do have these kinds of reactions it's now understanding that it is a character and there are reasons why the characters exist. [...] For example Mevrouw Rottenmeier [...] is saying no [...] unreasonable rules that I'm imposing on my daughter for no reason at all just because of the traditions that I grew up with”.

(Participant 16; 48 years old; female)

Each of the participants detailed how the process of becoming more cognitively self-aware was impacted by becoming conscious of their early caregiver dynamics and backgrounds, with Participant 13 describing these early experiences as the “root cause” of his triggers. He reflected on his discovery that as an only child, his mom’s love at times felt overwhelming for him, and he realized that his “ability to just tune people out of my thought

space when I am feeling like they're encroaching too much” something his life partner “abhors”, had stemmed from this early dynamic. Participant 6 detailed how her dad’s discipline had instilled a rigidity within her, as she explained he was a “strict, very disciplined man”, and later in the interview additionally reflected on the way her dating history echoed the destructive relationship experienced by her mother, “[M]y dad would break down my mom verbally, um, emotionally ...that played out in my relationships as well... I can now recognise it more”. Furthermore, in considering the origin of her triggers, Participant 16 reflected on her conservative upbringing, noting how these intergenerational parenting patterns were unconsciously adopted within her own parenting style, which she describes as “unreasonable rules” and “imposed [...] for no reason at all” and indicating her own dislike for this unconscious rule-driven approach to parenting. Being able to identify the origins of some of their unhelpful relationship patterns allowed the participants to use the tools learnt in the intervention to control their trigger responses and better understand their current relationship dynamics, as Participant 19, a 45 year old female said, “[H]ow she dealt with me also was very much like understanding why I'm so rigid you know [...] it helps me um not steamroll over my children like she would because she was overwhelmed”.

All the participants expressed that their experience of cognitive self-awareness, amidst their triggers, supported them in engaging differently and more positively with their significant relationships in their lives – from their spouses to aging parents to their children to work colleagues. In becoming conscious of their different parts of self, together with understanding their early relationship environments, participants spoke about the positive impact this self-awareness had on their personal relationships:

“In terms of my closest relationship was with my husband [...] we had a chat and ...I think he understands more you know where, where any of our certain heated or awkward um issues lie[...] for me I think it's allowing me to get deeper into the relationship you know. Because my, my trigger has resulted in me always having a value of distance, I suppose a protective layer. So ja”.

(Participant 14; 45 years old; female)

“I stopped seeing him as his own person [...] I escaped from her and then I got him immediately [...] I think I punish him a lot for what is my probably my mom...”.

(Participant 10; 43 years old; female)

"I had known for a while that I was doing more than I should for [my sons] and I wasn't empowering them. Um, so this has also made me a lot more conscious of the impact of my caring and doing was having on them. [...] And now that I'm saying "I don't think I need to do that, I think you need to do that," it's empowering for them, and I think it's growth for them that I was stunting".

(Participant 4; 60 years old; female)

Participants spoke to the value of how acknowledging and learning about their triggers significantly changed their personal relationships for the better. Participant 14 shared that owing to understanding her triggers, she was able to share the origins of her behaviour with her husband and as a result she moved into a deeper relationship with him. Participant 10 discovered how she had unconsciously super-imposed her mom onto her husband. She articulates that she *"stopped seeing"* him and *"punished him"* for issues that became ignited within her as a result of her relationship dynamic with her mother. Participant 4 and Participant 19 – two mothers – communicated the power of becoming more cognisant about how to develop and *"empower"* their children with self-accountability and self-effectiveness. Both these participants described how, in becoming aware of what was going on in their inner world, they were able to parent in a more conscious and healthy way without projecting their own issues onto their children.

Other participants spoke about their experience of their empathy increasing as a result of their growth in self-awareness. They described how in being able to observe their own triggers they became aware of when others were triggered, and felt more empathy for them as well as more tolerant in these situations. A few participants were surprised to find that this played out in their work contexts: *"I was thinking if I've gone through stuff, I mean for someone to respond in that way they must have also gone through some stuff, you know. So I have been more aware of [...] why people react a certain way"*.

(Participant 12; 38 years old; female)

Participant 12 relayed her experience of her changing relationship with her boss through the TBRH intervention. She realised everyone has “*a history*” and has “*gone through some stuff*” which brought about more empathy for her boss. While she still did not like her boss’s manner of communication, being able to identify her boss’s vulnerability helped her to manage her less than optimum leadership style. It no longer felt personal. Similar sentiments were shared by Participant 9, a 50-year-old woman, who communicated how she found herself experiencing more tolerance with a challenging work colleague, “*I’m more forgiving towards him because it’s not personally towards me, it’s his nonsense*”. Cognitive self-awareness and the ability to control their response to triggers seemed to transform previous triggers in certain settings into empathic responses and increased tolerance.

Participants reflected on these positive relationship changes with great joy and a sense of accomplishment as they gained more connection with their family and partners:

“[M]y wife could tell you that to this day that she’s seen an improvement in me. And that’s the one relationship that’s the most valuable to me”.

(Participant 8; 52 years old; male)

“[H]e notices [...] I’m not that argumentative, I’m more patient with him um, and I try to understand where his point of view um more, um objectively um, without jumping to conclusions or blaming or things like that”.

(Participant 21; 35 years old; female)

“[I’m] a bit more flexible and not always having the last word, not always having everything the way I like it done ... particularly with my husband, [...] for me it’s been a big, it’s been an important shift...”.

(Participant 27; 58 years old; female)

Several participants shared that their development of self-accountability and empathy in their relationships had been noted by their spouses who had commented on a positive

difference in their behaviour. The above participants, for example, spoke about how their ability to reduce their tempers, be less argumentative and more considerate of their partners' points of view, and be more flexible were integral to improving the relational health of their intimate relationships.

A notable outcome from developing this cognitive self-awareness related to participants development of self-worth,

“I have more respect for myself. I feel more confident to be me”.

(Participant 4; 60 years old; female)

[M]y feelings also count. That I'm valuable, I'm valued. ...[T]hat I'm also happy matters...”.

(Participant 2, 60 years old; female)

“[T]he big one for me was the mute [...] I know that when there's a confrontational situation [...] my inability to stand up for myself, the way I just go quiet [...] I understand it's within me”

(Participant 9; 50 years old; female)

“So like for this Sunday he wants the kids um because his mom's here to celebrate her birthday. And just by having engaged with him this week... being a little bit vulnerable and telling him where I'm at and what he must do, he's now actually messaged me in advance. So that's really amazing”.

(Participant 19, 45 years old)

All four women participants communicated how the process of becoming more regulated through self-awareness, and consequently holding themselves accountable to their personal principles, improved their self-worth. As participants 4 and 2 state, it helped them to have more self-respect and feel more “*confident*” and “*valued*”. Participant 9 began to address her freeze response in argumentative situations. Her growth in self-worth provided her with support to begin shifting “*the mute*” within herself. Participant 19 found herself able to engage with more vulnerability with her ex-husband, which produced

a positive outcome in which he began to honour her needs of contacting her in advance in their managing of their children.

The theme “Understanding my triggers”: cognitive self-awareness amidst triggers” formed a major outcome for the participants of the TBRH intervention. This theme served as a bridge between cognitive self-awareness, managing responses to triggers, and the impact this has on RH. This intervention defines RH as having two components; the relationship one has with oneself and the relationship one has with others. In embracing all facets of ‘self’, and understanding the origins of what they describe as their negative parts, participants shared their experience of moving into self-acceptance, which is explored in the next theme.

4.3.5.2 “It's part of who I am”: Arriving at self-acceptance

Participants described their journey of accepting and integrating what they described as the ‘negative’ parts of themselves. Some examples of these negative traits included, having a temper, quick to anger, and being controlling. Similar to the previous theme, many participants cited the ‘Character Analysis 1’ exercise in week 2, which involved working with contradictory parts of themselves as seminal in helping them to come to terms with their negative traits or their more contrary qualities. Participants articulated their experience of growing in self-compassion for their less desirable qualities and viewing these parts of themselves with more kindness and less judgment. Several participants expressed, that as they grew to accept themselves in their entirety, they became more accepting and compassionate towards the flaws in others.

Participants described their process of how they departed from unforgiving self-views to ones that became all-embracing. In the extracts below participants communicated this progression of how their attitude towards themselves softened:

“[I]n the beginning when we did the six characters, [...] I felt a [...] kind of like how pathetic are you? [...] Kind of a bitter distaste in you know in a way it was, [...] I wish I was not like that. I wish I didn't have these things about me. But at the end when we had to look at it again and I looked at these characters and, and I, I, I did feel like ag poor you and that it was fine, it was okay”.

(Participant 9: 50 years old; female)

“[A]t the start I was like there's no way, I can't relate [to] that character. A bit of denial...But (laughs) but now I'm much more comfortable”.

(Participant 6: 43 years old; female)

Participant 9 communicated moving into self-acceptance from a place of “*a bitter distaste*” in herself to a caring attitude of “*ag poor you*” through the intervention. This participant shifted from actively disliking a part of herself at the start of the intervention, almost wishing it away, to an attitude of compassion and curiosity for this part of herself. Similarly, Participant 6 narrated a flat out “*denial*” of a part of herself at the start of the intervention and by the end she had not only accepted that part of herself, but became “*comfortable*” with it. Her laughter illustrated her acceptance of and softening towards her vulnerability, and importantly, captured her journey from wanting to disregard this part of herself that she considered to be undesirable, to displaying a fondness for this “*character*”.

Many participants reported that they were able to accept their vulnerable and contrary parts within themselves, by seeing the ‘self’ as a tapestry of many parts, from their likable parts to their undesirable ones. The participants explained that the TBRH intervention exercises helped them through the process of observing their contrary parts amidst their agreeable parts. In this way they could see that their negative attributes were only a part of their whole self and not all of themselves, as expressed in the extracts below:

“[T]o use the one particular character that was associated with, with my kind of social nerves [...] and picture her and be alright with her, actually think, well, I like her. It's, it's, it's fine who she is”.

(Participant 25: 46 years old; female)

“I was, more aware and then, possibly kinder to the characters I had um less time for in the beginning”.

(Participant 1, 48 years old; male)

“I integrated different parts of those characters and to me it's like I don't see them separately, it's me as a whole and I don't see it as negative parts, [...] I just know that it's part of who I am”.

(Participant 21, 35 years old; female)

“I think just being a little bit gentler um uh with [...] myself [...] even if I think of the word “stickler” it's got a negative connotation, but actually um but why didn't I think of myself of being good at mapping or organising a situation you know”.

(Participant 7, 49 years old; female)

This journey through self-rejection to arriving at self-acceptance is echoed in the participants' sentiments above. Their language reflects their self-acceptance when talking about the more challenging parts of themselves. The participants above – as well as others not referenced here – used words like *“kinder”*, *“gentler”* and *“more gracious”*. Furthermore, they speak to the value of describing their undesirable traits as characters, which helped Participant 25 come to terms with her social nerves. By personifying and *“picturing her”* character, Participant 25 came to even *“like”* her social nerves and described including this with all her other parts and she felt *“fine”* with this aspect of herself. Participant 1 described being kinder to parts of himself that previously served as *“an annoyance”*. The word *“kinder”* indicates the active component of self-compassion of treating one's imperfections differently. Participant 7 described her process of changing the meaning she attached to her different characters and rather than view the *“stickler”* part of herself as having negative connotations she discovered that a *“gentler”* perspective is that she is *“good at mapping or organising a situation”*; hence, what was regarded as a negative trait becomes a good quality. This coming to terms with one's imperfections and bringing kindness to one's inadequacies in the moment, is a key mechanism within self-acceptance.

Finally, several participants described that in becoming more accepting of their own deficiencies, they became more tolerant of others' flaws and compassionate towards others' contrary traits:

“Everybody's ... in their own boat, but we're all in the same vessel or journey, so it's very, I found that helpful, I did. So you feel compassion for yourself and for everybody”.

(Participant 9: 50 years old; female)

“A more softer understanding perspective of myself and others”.

(Participant 10: 43 years old; female)

Similar to the previous theme, where cognitive self-awareness amidst triggers begets empathy for others, so too does self-acceptance (with its primary driver of self-compassion) effect compassion for others and their inadequacies. Self-acceptance leads to an arrival of understanding that vulnerability and imperfection is part of being human and is something to embrace rather than reject.

In summary, this theme traced the experiences of participants in arriving at greater self-acceptance. It described their process of developing self-compassion for their less desirable qualities and embracing these parts of themselves with more kindness, and in turn, expressing more acceptance towards the flaws in others. Once self-acceptance became part of participants' lives, they took care of themselves with more intention and shared how they began to value and prioritize their self-care. Participant 6, a 43-year-old female, went as far as designing a t-shirt for one of her problematic parts of self, to remind herself to take time for self-care, as she says: *“[F]or my George character I'm going to design a t-shirt for myself and some days when I need self-care I'm going to wear that t-shirt.* The value of self-care is explored further in the next theme.

4.3.5.3 “The things that I need in order to keep myself balanced”: Valuing self-care

Self-care formed an outcome of understanding for participants about what the different parts of themselves needed in order to remain soothed, regulated and in-balance. Participants learnt to prioritise time to take care of themselves.

“...it's made me very conscious of, of making time for myself. [...] caring for myself so that I'm able to care for those around me”

(Participant 4, 60 years old)

Participant 4 speaks eloquently about the importance of becoming conscious about the time devoted to herself, and how this shaped her relationship with self-care – which resonated strongly with the feelings shared by the other participants in this study. Through their engagement with the TBRH intervention, the participants highlighted a distinct change in attitude towards caring for themselves by making time to do activities that kept them in balance, brought them joy and contributed to their regulation. The ‘Character Analysis 1’ exercise in week two in which participants worked with contradictory parts of themselves, offered participants insight into the specific activities that either soothed or regulated each character or part within themselves. As a result of this process as well as the check-ins on participants’ chosen weekly self-care activity throughout the six weeks, participants reported experiencing the value of self-care.

The participants often spoke about the value of the intervention in helping them to challenge their own beliefs that self-care ought to be “earned” and “deserved”:

“I thought I had to deserve it, or earn it. And that was a very interesting realisation, ...I couldn't go have a bath until I had absolutely finished cleaning the kitchen at night kind of thing. [...] You know I don't have to have done all my jobs, done all my homework before I can do something”.

(Participant 5, 56 years old)

“[M]aking a conscious effort to put time aside...I'm going to listen to that podcast now [...] whereas before [...] I might start it but I have to go cook, I have to go pick the boys up and I would stop it. Now I'm carving out that time to do it”

(Participant 4, 60 years old)

It was commonly shared by participants that practicing self-care involved unlearning belief systems that prioritise work and other “jobs” above their individual needs. For example, Participant 5 recounted her realisation through the TBRH intervention of how she placed pressure on herself to “earn” her downtime such as “a bath”. She recognised that she was treating herself like a schoolgirl – she’d have to have “done all my homework” before

she could take care of herself. Even the simple activity of taking a bath required first duty to be completed. Participant 4 narrated her experience of “*carving out that time*” for things that brought her pleasure and fulfilment and no longer allowing that time to be interrupted.

Participants described their experience of self-care as creating more room and ‘space’ within their lives and enhancing their connection with themselves and others. Importantly, self-care and living balanced lives were practiced by participants through drawing boundaries and learning to say ‘no’:

“I make time for myself, for myself alone. [...] I'm made more aware that those are the things that I need in order to keep myself balanced”.

(Participant 14, 45 years old)

“Not to just be "oh I don't have time for me because it's this and this and this endlessly...I kind of learned to say also no”.

(Participant 10, 43 years old)

Several participants referenced the value of self-care in not only helping them achieve balance, but also helping them to care for others. For example, Participant 14 shared her experience of how through the TBRH intervention she became aware of what she needed to do for herself “*to keep balanced*”. She spoke about the busyness of having two young children in addition to her full-time job, yet despite this and more importantly because of the value it brought into her life she made time “*for myself alone*”, which in many ways, resonates strongly with Participant 10’s journey of learning to say “*no*” and set boundaries.

Once participants made conscious efforts to implement self-care strategies, their connection with self and others appeared to be enhanced. Participants reported feeling increased connection with others owing to their self-care activities.

“Every morning when I do it, I think of my mom and I think of my sister. And it also just helps ease the day”.

(Participant 27, 58 years old)

“I think that was part of one of the self-care activities that I try to engage in, is to be more deliberate in contacting people [...] just by message or a phone call or something [...] I did put myself out there a little bit more which I do see as a form of self-care”.

(Participant 15, 34 years old)

Participant 27 shared her ritual of drinking hot water with lemon and honey first thing in the morning. This was something her mom and sister did too. They both lived abroad, and she missed them. Sharing in this ritual with them daily, albeit alone, helped her to feel more connected to them and the attention within this practice *“also just helps ease the day”*. Participant 15 described himself as an introvert and shared that he felt lonely. His journey of self-care grew to incorporate *“contacting people”* and he reported feeling the benefits of this reaching out. Participant 12, a 38-year-old female, communicated how in forgoing guilt and paying attention to nurturing herself, she found she had more capacity for her husband and his emotions,

“I shouldn't feel guilty about that about making or finding time for myself [...] already being full and not having [my husband] fill anything anymore, I can be more understanding of whatever he's going through”.

(Participant 12, 38 years old)

In summary, many participants said that they were not doing anything new for their self-care activities, but rather that they were being more intentional about doing the things that brought them rest and pleasure and kept them in equilibrium. The regulatory component of self-care was experienced and commented on by a few participants who incorporated the breathing tool, the GNLBE, learnt in the intervention as part of their self-care. Participant 16, a 48-year-old female, shared how one of her big takeaways from the TBRH intervention was understanding the impact of self-care on her physiology, *“the self-care um activities because that has an impact on the physiological response and on the emotions”*. This physiological awareness and its impact on relational health is discussed in the next theme.

4.3.5.4 “Doing it calms me”: Using the GNLBE to improve relationships

All the participants highlighted the GNLBE as pivotal to improving their relationships. The GNLBE is a breathing tool designed to regulate emotions within

relationships. Participants were taught to attune to their sensations in the core area (the belt area), in order to understand the capacity of their nervous system in a given moment. Subsequently, through breath and colour visualisation, participants activated the PNS for calmness and stability. This exercise guides participants to inhabit their bodies through listening to internal physiological sensations in the belt area and activates the PNS through breathing into this area with the addition of colour visualisation. This technique is designed to promote calm and social engagement (refer to Section 3.5. in Chapter 2, page 152, for a full description of the exercise). The GNLBE forms a core component of the TBRH intervention and was practised in each week of the intervention as well as at home in between sessions.

Most participants recounted their experience of developing body awareness through becoming aware of their body sensations while practising the GNLBE. They highlighted discovering a body awareness, a link between their physiology and emotions, and with it, a portal to their inner world:

“I live very much in my mind, and I’m detached from the body, so that was kind of interesting uh to feel all kind of emotions the way that feels you know, to be kind of aware that you have a body”.

(Participant 10: 43 years old; female)

“[T]he awareness of the physiological response to, to emotions, being aware of that”.

(Participant 16: 48 years old; female)

“I’m usually someone that lives very much permanently in their head um, and so even emotions are, um, something that I’ve dealt with on a cognitive level”.

(Participant 1: 48 years old; male)

“[M]y body is responding to something so to listen to it...And if it's uncomfortable, you’re going to be uncomfortable, so your body wants to be feeling comfortable and healthy, so it reminds me, also another thing is um uh I’ve stopped smoking for two weeks now because my body says no”.

(Participant 9: 50 years old; female)

Participant 10 described discovering “*you have a body*” and the grounding impact of inhabiting it. The experience of accessing her feelings ‘inside her body’ was new to her and brought about a more vivid experience of connecting to her emotions. Participant 16 re-iterates this discovery of the physiological component of emotions and expressed becoming more “*physiologically aware*”. Both participants described how body awareness enabled them to be more emotionally aware, and to experience their feelings as sensations within their bodies as opposed to detached mental constructs. The experience of being physically detached from emotions and dealing with them at a cognitive level only was re-iterated by Participant 1, who described “*even emotions are...dealt with on a cognitive level*”. Participant 9 shared how becoming aware of her body sensations had led her to pay attention to the information her body was giving her, and how this integration of her body with her emotions informed how she responded to her feelings. Participant 9 recounted how she began to listen to her body, so much so that she began to trust it for information on actions she needed to take to be in balance. She attributed her having stopped smoking to this trusting of her body’s signals.

The GNLBE developed moment-to-moment awareness, enabling participants to be present with themselves and others. Participants expressed a greater sense of physiological awareness, communicating their observation of the link between their physiology and emotional responses:

“So just the lack of distraction, you know, and kind of imaginings and sometimes distressed imaginings [...] a presence um a focus, and it feels nice”.

(Participant 25, 46 years old; female)

“[If] it was a stressful conversation I'm going to be having, I'm already ... like prepared for whatever is going to come up. ... my response then afterwards won't be out of stress or worry or whatever, it will be out of whatever is presented”.

(Participant 12, 38 years old; female)

Participants 12 and 25 – as well as other participants in this study – communicated their experience of how the GNLBE empowered them to have healthier conversations with the development of present-moment attention. This present-moment awareness enabled participants to respond to people and situations at the moment rather than from the perspective of past mulling or future worry. Participant 25, for example, states her experience of how the GNLBE brings her out of “*distressed imaginings*” and back into the present moment which “*feels nice*”. She shared the impact of moving out of the future worrying and returning to inhabit her life in the here and now. Participant 12 relays how she uses the GNLBE to prepare for stressful conversations so that her response inside of the conversation is not out of “*stress or worry*” but rather from attending to “*whatever is presented*” at the moment. This same participant conveyed relief at being able to stop her “*mulling over things*”. Rather she was able to be present with- and pay attention to her inner world enabling her to ask herself “*at this time what do you need?*”. Letting go of ruminating thoughts was reiterated by several participants.

A key outcome of the GNLBE, as told by participants, was a feeling of calmness after doing the exercise. Many participants spoke of feeling “*grounded*” and “*centred*” after doing the GNLBE:

“I just focus on my breath and it just brings me back and I find it wonderful ...and it makes me calm quite significantly which is great you know”.

(Participant 8: 52 years old; male)

And the golden nugget has also taught me to ground myself. [...] It's almost empowered me [...] which gave me some more confidence in the sense that you know what I can do this. It's tough but I'm pretty sure like just tackle it as it is.

(Participant 21: 35 years old; female)

“[W]hen he is reacting to his insecurity or his frustration with not getting the concepts, I'm able to be calm because I am able to just keep myself calm. I think it diffuses situations as well because [...] I'm not reacting to their frustration”.

(Participant 4: 60 years old; female)

“[I]t's also made me pause, you know create more moments to pause, to not react too quickly um and to just, I think just to react from a much calmer place when I am ready to react”.

(Participant 14, 45 years old; female)

The participants noted how the Golden Nugget exercises helped them to achieve a sense of calm, and this equanimity transformed how they engaged with themselves and with others.

Participant 21 shared how grounding herself through the GNLBE “empowered” a sense of confidence in herself that she “*can do this*”, and “*just tackle it as it is*”. The GNLBE initiated ER and consequently inhibited the participant’s fear surrounding her upcoming board exam and fuelled a sense of confidence in her. Similarly, Participant 8 articulated the simple practice of shifting his attention to his breath and then breathing, he returns to himself; “*it just brings me back*”. It is as if through the exercise and becoming calm he re-experiences his true self, rather than becoming lost in this stress, something he finds “*wonderful*”. Participant 4 describes how her son becomes extremely stressed during exam time and prior to the GNLBE tool, she reacted to his stress. Her subsequent calm from using the GNLBE was changing this dynamic, a similar experience articulated by Participant 14 who speaks about the power of “*pausing*” and being more thoughtful about her reactions before responding.

All the participants cited the GNLBE as the tool that – when combined with cognitive self-awareness (see Theme 1) – enabled the management of triggers in relationships:

“[I]it's an improvement of the conversation because it's calmer, it's not so aggressive, it's not so combative. And then you actually get some feedback instead of when somebody shut down on you because you were just screaming right”.

(Participant 10, 43 years old; female)

[T]here was an incident just this past weekend where I was really, I realised I was triggered by something um and I was going to go fix it, and I thought no no, you're not going to fix anything, just do the breathing. Um, and I found that incredibly helpful, it really flipped it, there was nothing to fix, it was just me actually who had the issue, nobody else".

(Participant 5, 56 years old; female)

"[U]nderstanding that, ja, I'm nervous. So I'm going to be shaky and uncomfortable and a little bit weird. But if I then breathe and ground myself and not be weird, I'm going to actually shift the direction of that relationship".

(Participant 25, 46 years old; female)

All participants highlighted the GNLBE as a key mechanism for positive change in their relationships. As the intervention progressed participants, such as those noted above, shared how the GNLBE prepared them for difficult conversations with significant others or at work meetings. As they felt they were becoming triggered they would use the GNLBE to calm themselves. For example, Participant 5 learnt, through the 'Character Analysis 1' exercise in week 2, that she had a part of herself who was a fixer and would jump into 'repair' situations, regardless of whether it was her responsibility or not. She related her experience of practising cognitive self-awareness amidst triggers and then using the GNLBE which "*really flipped it*" highlighting "*it was just me actually who had the issue, nobody else*". The GNLBE enabled her to inhibit her habitual reaction. Similarly, Participants 10 and 25 shared their experiences of "*shifting*" the direction of their relationships by being calm and cognitively aware. Participant 10 described an improved conversation with her daughters as a result of her calm manner versus her usual "*combative*" approach. Her daughters felt safe to communicate openly with their mother. Participant 25 articulated her discovery of working with her social nerves through doing the GNLBE, and consequently, she was able to "*shift the direction of that relationship*".

An integral outcome of being physiologically and cognitively aware of their feelings and triggers involves listening more attentively to others. Many participants detailed

their experience of noticing how their listening had changed through the intervention to become more active, compassionate and unfiltered:

“[T]here's a more two-way engagement, like you're more, you're more able to, to listen to the other person and, and to notice their stuff. You're not just sitting inside”.

(Participant 1, 48 years old; male)

“Then when you do go in you can really listen to what the other person is saying and respond of that, not on the conversation you're having with yourself, trying to protect yourself in a way”.

(Participant 12, 38 years old; female)

“[It] also makes me more of a kinder person so I think that also leads to being more empathetic as well”.

(Participant 8, 52 years old; male)

Both Participants 1 and 12 shared how their listening moved from an internal focus to full attention on the person with whom they were engaging. Participant 1 references his habit of listening while being absorbed in his own inner world by using language like, *“you're not just sitting inside”*, and Participant 12 described how she had been listening to others while simultaneously *“trying to protect”* herself from what they might have to say. When conversations are challenging, there may be a natural inclination towards defending oneself; where listening ought to be externally focused, very often a person's focus is internal. The GNLBE served as a mechanism to change this, enabling participants to feel safe and therefore able to listen without judgement. Participants described how the calm engendered through the GNLBE, brought about a sense of safety and stability that supported them to inhabit the present moment completely. Moreover, they went on to explain that this presence led to active listening versus a listening encumbered with a simultaneous internal monologue defending or explaining their behaviour. Although Participant 8 does not reference listening specifically, he spoke about being *“kinder”* after doing the GNLBE exercise as well as *“more empathetic”*. This does indicate a different way of listening and responding to those key individuals in his life. This sentiment of compassionate listening was echoed by many participants through the intervention.

Participant 1 described how his listening changed from an internal focus to a completely external focus after the GNLBE, where his full attention was with the person he was listening to. This listening moved away from the personal to simply being able to listen to others' points of view with openness and curiosity.

In line with their improvement in listening to others, several participants mentioned how using the GNLBE improved their communication style. This applied to interactions with strangers to intimate family members, work colleagues, and clients. The extracts below talk to the diversity of relationships in which the GNLBE shifted the manner of communication:

"I would have previously marched in and thrown a hissy fit of great proportions whereas I consciously tuned in and went about it in a different way. Without being a bully, without swearing, without bashing anyone".

(Participant 3, 60 years old; male)

"I get the Scrabble out, [...] I don't go into confrontational space, and, and that does give me a lot of peace of mind and heart because [...] I feel better, if she died tomorrow, I'd be fine because we're, I never come away with any angst."

(Participant 2, 60 years old, female)

"I used [the golden nugget] on Friday again in a meeting where I ordinarily may have been a bit harsh in the meeting, critical, and I was patient um and it had a better outcome".

(Participant 14, 45 years old; female)

"I have a difficult client um at work, [...] every second week I have a call with this client, and it is always a long, tiring, draining call, and I had the call last Wednesday [...] I went and I stood outside and I did the golden nugget first and then I went into the call. It was no less difficult, but it was manageable you know, it was like fine we can all, we can do this together.

(Participant 5, 56 years old; female)

The quotes above serve as a testament to the range of relationships impacted by the GNLBE. Participant 3 shared his experience of using the GN to “*consciously tune in*” and regulate himself so that his manner of communication is not that of “*a bully*”. As he explained, later on in his interview, through the GNLBE teachings, he was able to express his disappointment to the shop manager about the faulty heater that was sold to him in a measured, thoughtful manner. The impact was two-fold – the shop manager did not receive “*a bashing*” and Participant 3 circumvented the shame he described he goes through afterwards, “*I feel quite embarrassed and stupid afterwards*”. Participant 2 described her arduous experience of taking care of her ageing mom owing to the complexity of their relationship. She would find herself coming away from their time spent together feeling equally frustrated and guilty. She shared how using the GN had altered their relationship so much that she no longer moved into “*confrontational*” spaces with her mom and left their time spent together with “*peace of mind and heart*”. Her mom was old, and should she die, this participant described how she would feel at peace. Lastly, Participants 14 and 5 described how using the GNLBE at work enabled healthier communication. The experience of being able to work better with colleagues that one found challenging or difficult was re-iterated by several participants. Participants 14 and 5 both speak to the benefits of taking a more “patient”, collaborative approach to challenging work situations, as Participant 5 uses the phrase “*we can do this together*”.

The theme “Doing it calms me: using the GNLBE to improve relationships” encompassed a main outcome for the participants of the TBRH intervention. Together with cognitive self-awareness amidst triggers, the GNLBE led to the regulation of triggers within relationships. Participants cited the breathing tool as significantly contributing to improved relationship outcomes. The GNLBE served as a mechanism to activate ER within stressful conversations, thereby igniting an improved quality of attention, listening and communication style. Moreover, participants developed compassionate listening and increased tolerance through the calmness generated by the GNLBE. This enabled positive outcomes within social engagements and relationships. The relational component of the TBRH intervention was reflected in the format of the group context. Participants reflected on how the group environment formed a significant component in enabling their growth, which is explored further in the next theme.

4.3.5.5 “I could relate to everything”: The group as a support system

All participants reported the group format was a highlight of the TBRH intervention. Although many participants came from different backgrounds and represented different age groups, they expressed a deep connection with their fellow peers in the group. The group was experienced as a space of support and reassurance for participants and encouraged their depth of reflection and sharing. The opportunity to listen to other participants ignited perspective-taking in-group members, and for some, helped them to verbally express their own emotions and thoughts – which they had struggled with in the past. Participants expressed that despite having come from different walks of life, they were able to relate to the issues, struggles and vulnerabilities of other group members, regardless of their differences in age, gender, race, culture or ethnicity:

“I had like, these women, including [the facilitator] from totally different cultural backgrounds and um, age groups really. And I could relate to everything that they were saying, and everything they'd been through [...] there was a lot of vulnerability in them and I'm grateful that they showed that to me”.

(Participant 17, 37 years old; female)

“I think that the others brought a lot of experiences that I was able to relate to, and their experiences helped... how they handled things ... we all have our own hang-ups and we can all learn from each other”.

(Participant 18, 46 years old; female)

“I felt that, wow, you, I'm not alone in this...we could share similarities and we could learn from each other”.

(Participant 24, 54 years old; female)

“[T]here was just this common theme of you know, 'I'm here, these are my struggles,' and it's so funny that you actually realise that oh my gosh we are so alike. Like there's a common thread amongst us [...] You don't speak about these things, so you never know. [...] you're not alone in how you feel. It's normal”.

(Participant 21, 35 years old; female)

Participant 17 was much younger than her group members and expressed her surprise that they were still grappling with similar issues to her. Furthermore, she articulated gratitude for being exposed to the trajectory of life's continual growth. She communicated being comforted by how she was able *"to relate to everything"* as well as being privy to others' vulnerability. This comfort was echoed by Participants 18 and 24, who emphasised the confidence inspired in them through realising we all have *"hang-ups"*, as spoken by Participant 18 and the realisation *"I'm not alone"*, as shared by Participant 24. This sense of common humanity was described by Participant 21, who felt her feelings and experiences were *"normal"* as a result of the other group members sharing. She echoed the sentiments of connection communicated by Participants 18 and 24, *"you're not alone in how you feel"*. In addition to listening to participants' check-ins at the start of each session and their feedback at the end of each session, the participants took part in role-plays in week five. Each participant brought a potential real-world stressful relationship situation from their lives to role play. They chose a group member to play the other person and instructed them in vocal tone, eye gaze, facial gesture and body orientation. They then used the GNLBE to remain regulated through the difficult conversation. Participants were both part of each others' role-plays and were able to observe each other in the group. Most participants shared the impact of witnessing their group members both in their role-plays and the value of participating in their stories:

"[S]eeing the difference in other people...you know experiencing it vicariously through them...it was profound. It was profound to see them do the breathing and then respond so differently. It was really amazing".

(Participant 19, 45 years old; female)

"[T]here was some major shifts that happened um with people in the group. It was amazing to witness that... it's quite humbling I think".

(Participant 7, 49 years old; female)

Participants recounted the value in witnessing their fellow group members in the role-plays. In observing the role-plays and the difference in how people responded before and after the GNLBE, Participant 19 shared how it was akin to *"experiencing it vicariously"* through them. This indirect experience encouraged participants to be more courageous and partake in the role plays and share their vulnerabilities. Participant 7 used the word

“*humbling*” to describe her experience of witnessing others’ “*major shifts*”. She recounted how this enriched her whole experience of the intervention. She felt connected to peoples’ “*life stories*” and emboldened by their development. Many participants reflected on being strengthened in their own lives through being privy to the lives of their fellow participants.

Several participants narrated how the group contributed to their perspective taking, with regard to viewing a problem they experienced differently. Moreover, through listening to others, participants were able to put words to their own feelings for the first time:

“ [P]eople have you know very different um lenses that they perceive life through, many of those people nevertheless have very similar kinds of problems to the problems that you're facing[...] many of them had similar issues in life. [...] I liked was seeing how people verbalised them because I always battled to verbalise my feelings”.

(Participant 13, 4 years old; male)

“[W]hen people are prepared to be a little vulnerable and open it, it helps other people follow that so, so there's good modelling in that sense”.

(Participant 1, 48 years old; male)

Participant 13 shared how exposure to the different “*lenses*” of people’s lives profoundly expanded his perspective-taking, especially as people have “*similar kinds of problems*”. He was able to gain insight into his issues from a different vantage point. Moreover, historically he had “*battled to verbalize*” his feelings and was able to emulate other group members. This “*modelling*” was reiterated by Participant 1 who described how the group members’ vulnerability encouraged his own depth of sharing. The group created a space where each person’s journey inspired another, helping each participant feel validated and accepted.

All the participants emphasised the role of the facilitator as a key mechanism in enabling a feeling of safety and trust within the group. Participants articulated qualities within the facilitator that were essential to forming a safe space within the group that encouraged sharing:

“[S]he is absolutely fully present. She really listens. [...] you feel like you can say anything. She's completely non-judgemental. Um that's very important. Fully present, non-judgemental, listens carefully”.

(Participant 9, 50 years old; female)

“[...] authenticity, um and just the capacity to hold everyone's experience in a very non-judgemental way”.

(Participant 23, 49 years old; female)

“I think the most important thing for a facilitator is to read the group, to read people and to listen, to be tuned in, you know, to be tuned in”.

(Participant 3, 60 years old; male)

“She guided us, and she made us feel safe to open up and she was quite aware of any like um feelings of discomfort or if there are difficult feelings that we were experiencing”.

(Participant 21, 35 years old; female)

Participants emphasised the role of the facilitator as being pivotal to setting up and holding a safe space for the group. They described their experience of the facilitator as inspiring trust in themselves and the group environment and highlighted how her attitude and insight were key features of this. For example, Participant 9 highlighted the facilitator's capability to be “*fully present*” and “*non-judgemental*” and to listen in a manner that “*you feel like you can say anything*”. She echoed the active listening and presence participants referred to in theme 4 as a quality that enables openness in others. Participant 23 adds “*authenticity*” as an essential quality in addition to “*non-judgement*” – *both qualities that* create a sense of trust and encourage participants to share. Participant 3 talked to a different set of skills in which the facilitator “*tuned in*” to the group and to people to “*read*” them. He spoke to the attribute of a deep listening into where others are at within themselves, and consequently how to engage with them and hold them. This too contributed to the development of trust in the participants and a feeling of safety. Participant 21 articulated her experience of feeling “*guided*” and “*safe*” which enabled being “*safe to open up*”. Finally,

some participants highlighted the attitude of the facilitator as central to creating the atmosphere of the group:

“[S]he was just so positive, always kept us on the right track ... super insightful as well”.

(Participant 13, 46 years old; male)

“She's very empathetic, she's very light, she doesn't bring her own stuff into the room.”

(Participant 3, 60 years old; male)

“[T]he gentleness, but also, I think [...] demandingness or you know the, the way she challenged you to get engaged in what was happening. [...] a gently challenge. [...] she was very clear and, and firm. I quite like that.

(Participant 14, 45 years old; male)

Participant 13 used the phrase, “*so positive*” to describe the facilitator’s attitude. Where Participant 3 used the words “*light*”. Both attribute the facilitator’s optimism and bright nature as creating an atmosphere that inspired confidence. Participant 14 on the other hand, spoke to the facilitator’s “*demandingness*” and used the word “*firm*” to describe her approach, and while combined with “*gentleness*” she attributed being “*gently*” challenged as inspiring confidence. Participant 13 in addition spoke to the facilitator’s “*insight*” inspiring sureness in the participants, where Participant 3 spoke to the facilitator’s “*empathic*” nature enabling feeling understood. Participant 3 went further to note the importance of the facilitator’s focus being entirely on the group, “*she doesn't bring her own stuff into the room*” as contributing to the group environment.

In summary, the group format was experienced by participants as contributing to a feeling of common humanity and encouraging shared vulnerability and depth of reflection, in addition to increased perspective-taking. Moreover, participants shared the pivotal role the facilitator plays in creating a safe space for the group that inspires confidence.

4.4 Chapter Summary

This chapter explored the participants' experiences of the TBRH intervention through open-ended semi-structured interviews and using realist thematic analysis to analyse the data. Participants shared their experiences of developing cognitive self-awareness amidst triggers facilitated largely by understanding their contradictory parts of themselves and how to soothe and regulate these parts. In addition, understanding the influence of their early caregiver dynamics on the development of their nervous system reactivity and subsequently, their current relationship patterns enabled deeper cognitive self-awareness amidst triggers. Participants described their process of arriving at self-acceptance and how they became kinder in response to their more negative attributes and inadequacies. Additionally, participants communicated how they began to prioritise their self-care. They shared how this positively impacted their relationship with themselves and with their significant others. Participants described the use of the GNLBE exercise as a significant enabler of regulation. The calmness engendered through the GNLBE initiated active listening and better communication. In turn, this helped participants to manage challenges in their relationships and improve their relational well-being. Finally, participants communicated how the group format was pivotal to their learning and ability to share their vulnerabilities, adding that the facilitator's attitude and aptitude were central to creating a safe and trusting environment.

Chapter 5

DISCUSSION

This study hypothesised that a novel behavioural intervention, the TBRH intervention, would develop IAw and ER to improve RH within the context of stressful relationships. The TBRH intervention is a new behavioural intervention which targets the neurobiological processes which underlie ‘presence’. In acting pedagogy, ‘presence’ is the ability to stay attuned to present moment experience and not deviate into future or past thinking. It is an essential tool to entrain the actor to remain connected and responsive to how external environmental cues activate the character’s inner life and, thus, their behaviour (Barba & Grotowski, 1999; Brook, 1988, 1996, 2017, 2018; Marowitz, 1986; Moffitt, 1999; Rodenburg, 2009; Schechner & Wylam, 2013; Stanislavski, 2013a, 2013b). In MBIs, presence refers to the ability to be open, curious, and non-judgemental to body sensations, emotions, and thoughts (Hofmann & Gomez, 2017; Kabat-Zinn, 2003; Kabat-Zinn et al., 1998; Vollestad et al., 2012; Zhang et al., 2021). The TBRH intervention situates itself within MBIs and the novel therapeutic interventions emerging within the third wave of CBT interventions (Hayes et al., 2012; Teasdale et al., 2002). These interventions target the neurobiological processes of present-moment attention (Shapiro et al., 2008; Tang & Posner, 2012a; Tang et al., 2015).

Results from neurobiological, behavioural, and qualitative measures in this study appear to demonstrate improvement in IAw and ER. Many of these results are corroborated within the existing literature, while some results seem to establish novel contributions made by this study. What follows is a succinct summary of the results which I will be discussing in detail within this chapter.

There were no changes over time in five-minute baseline HRV measures from pre- to post-intervention. However, there were acute changes in HRV measures during the novel breathing exercise, the GNLBE, and the relationship stressor task in the laboratory. These changes occurred during the breathing intervention and carried over into the post-stressful relationship conversation task. The HRV measures differed significantly when comparing the first part of the stressful relationship conversation to the second part immediately after the novel breathing intervention, the GNLBE. Importantly, significant correlations were found between increases and decreases in subscales of the behavioural questionnaires and the changes in five-minute baseline HRV measures. Most of these correlations were novel

findings that seem to have indicated improvements in both IAw and ER, as further shown through the pre- to post-MAIA-2, FFMQ, and SCS scores. We saw the indication of verification for IAw both in associations with changes in subscales of the MAIA-2 and FFMQ and changes in HRV measures. Moreover, IAw seems to be demonstrated through increases in the MAIA-2 and FFMQ scores. The study suggests it saw evidence for ER both in the HRV measures and the acute relationship stressor laboratory task, indicating psychological flexibility and adaptability when faced with a challenge. In addition, it appears ER increased as reported through the MAIA-2 and FFMQ regulatory scales as well as the Total Score of the SCS. The combination of these scales, together with the correlations with HRV measures, suggests improvements in ER. Associations between changes in the Total Score of the SCS and changes in HRV were presented, suggesting self-soothing and social engagement behaviours. Qualitative findings supported the quantitative findings both concerning IAw and ER. Importantly, the qualitative findings articulated participants' experience of improvements in their relational health.

5.1 Study 1 – The Pilot Study

Study 1, the pilot study, served to assess the feasibility and acceptability of the TBRH intervention as well as its preliminary efficacy with regard to developing IAw and ER in the context of stressful relationships.

5.1.1 Feasibility and acceptability of the TBRH intervention

The TBRH intervention was deemed feasible and acceptable across participants. In line with previous research, the feasibility of the TBRH intervention was measured by the high retention of participants. Notably, attendance was high at 85.7%, surpassing standard attrition rates (Bluth et al., 2016; Henje Blom et al., 2016; Hjeltne et al., 2017), with 12 of the 14 participants completing the full programme. Two participants dropped out in week one owing to illness and time constraints, respectively. The format, timing, and exercises were cited as feasible and acceptable by all the participants. The timing increased in weeks three and five, from two hours to two-and-a-half hours, and participants found this acceptable in relation to the content of these sessions. As is common within MBIs, the group format was reported as pivotal to the participants' growth and engagement with the programme (Keyworth et al., 2014; Yavuz Sercekman, 2024). Notably, in the South African context, where historical race issues are prevalent, the diversity of the group was reported as accelerating individual growth through witnessing shared vulnerability and enabling a feeling

of common humanity. The role and style of the facilitator were cited as central to the success of the programme, with active listening, empathy, and an attitude of non-judgement reported as essential attributes.

Results demonstrated the preliminary effectiveness of the TBRH intervention in developing IAw and ER through quantitative self-report measures and qualitative interviews. Study 1 was conducted in-person; however the questionnaires were filled in online. Study 2 was conducted online during Covid-19; however questionnaires were filled in at the laboratory in-person. This may have impacted the Cronbach Alphas for study 1 which display less reliability within some sub-scales. Specifically, in the MAIA-2, 'Not-Distracting' moves from 0.93 in lab 1 to 0.52 in lab 2. This could be a reflection of response bias as lab 1 has excellent reliability. The same with the subscale 'Not-Worrying' which moves from 0.72 to 0.59. The SCS follows the same pattern with subscales 'Self-Kindness' (0.86 to 0.59) and 'Common Humanity' (0.74 to 0.51), however 'Self-Judgement' moves from 0.74 to 0.51 and 'Mindfulness' begins at 0.27 in lab 1 and moves to 0.82 in lab 2. Thus the SCS results for Study 1 need to be interpreted with caution. The small sample size of 10 may account for these vast discrepancies.

Owing to the promising results, a main study with additional neurobiological measures was conducted.

5.2 Study 2 – The Main Study

The main study assessed the TBRH intervention in a quasi-experimental, waitlist-control design with Groups A and B to measure neurobiological, behavioural, and qualitative changes pre- versus post-intervention in IAw, ER, and RH. This was followed by assessing a retest group, Group C, who participated in the Breathing Only intervention, to separate the effects of the full TBRH intervention from the breathing exercise, the GNLBE – a core component of the TBRH intervention.

5.2.1 Pre- vs post-HRV measures of the TBRH and Breathing Only interventions

There were no significant changes in baseline HRV measures pre- versus post-the TBRH intervention nor pre- versus post-the Breathing Only Intervention. This is in line with previous research in which changes in HRV take time to change at baseline (Bornemann et al., 2015; Heckenberg et al., 2019; Radmark et al., 2019). There is a paucity of standardised and large-scale RCT studies that investigate the impact of MBIs on HRV measures.

Moreover, current research combines movement-based interventions with standardised MBIs, and their baseline constructs may produce differing results, with more movement-based interventions having an increased impact on HRV (Radmark et al., 2019). A study to disentangle the impact of standardised MBSR (which incorporates movement through yoga and mindful walking) from yoga-only and mindfulness-only interventions found the yoga and MBSR groups produced an equal impact on HRV measures at baseline and significantly more than the mindfulness-only group (Hunt et al., 2017). This may suggest movement has a greater impact on HRV in the short term as these were 4-week interventions, half the length of the standardised MBSR. Furthermore, the MBSR and yoga interventions were more likable and based on previous research might attest to the increased adherence to home practice owing to the likeability of the exercises (Bornemann et al., 2015; Brown et al., 2022; Taylor & Millea, 2016). Several meta-analyses resonate with these findings. For instance, in a meta-analysis of 19 MBIs, gold standard MBSR, and other CBT interventions, there were no significant changes in HRV measures pre- versus post-intervention (Brown et al., 2022). Moreover, non-gold standard interventions showed higher indices of HRV post-intervention than the gold standard MBSR, though still non-significant (Brown et al., 2021). Similarly, another systematic review and meta-analysis of 17 yoga and tai chi interventions showed there were small to moderate effect size changes in four yoga interventions after eight weeks, while the tai chi intervention took 19 weeks to show change (Zou et al., 2018). Practice time ranged from 60 minutes to 200 minutes per week. It is important to note that the TBRH intervention is six weeks in duration, and the breathing component is four minutes of practice time per week, and the recommended daily homework practise was one to four minutes daily. This departs from the standardised focus-on-breath and body scan protocols, as well as mindful walking and yoga, in the standardised MBSR, which comprise the majority of the two-hour weekly sessions, and homework practice is encouraged for 30-45 minutes of daily practice (Goldberg et al., 2022; Kabat-Zinn, 2003; Kabat-Zinn et al., 1998; Querstret et al., 2020). Yoga and tai chi both have breathing and attentional components, which equate with mindfulness (Zou et al., 2018). In a systematic review with a meta-analysis of MBIs in workplace settings, only one study measured HRV and showed improvement in heart rhythm coherence after 12 weeks (Heckenberg et al., 2019). This study further elucidates that HRV is slow to change at baseline. Bornemann and colleagues (2019) found HF HRV increased during a biofeedback task after three months of presence and interoception training (focus-on-breath meditation and body scan practices only). However, HF HRV showed a significant increase only after six months with the addition of a three-month socio-affective training

module. This module included loving kindness mediation (LKM) and dyad practices, the social nature of which may have contributed to the significant increase in HRV (Bornemann et al., 2019) as in previous research (Kok et al., 2013; Kok & Singer, 2017). However, there were no changes in baseline HRV. Only one study reported changes in baseline HRV over a 6-week intervention (Kok et al., 2013). Participants practised generating feelings of love and connection to themselves and others for one hour per week and were encouraged to practice daily for a length of their choice. The mechanism of change was postulated to be the increase in perceived social belonging and connection felt by participants, which is suggested to be linked to increased vagal tone (Kok et al., 2013). This study demonstrated notable outcomes on the impact of social connection on the heart. Cardiac regulation has been linked to social engagement (Geisler et al., 2013; Park & Thayer, 2014). In this study, simply the perception of increased social engagement increased HRV, confirming the pivotal role relationships and social interaction play in the brain-heart nexus and re-iterating the key role relationships have in maintaining homeostasis. Similarly, to the majority of previous research, in the TBRH intervention and Breathing Only intervention, baseline HRV did not change significantly.

5.2.2 GNLBE – an acute intervention that increases HRV during a challenge

The GNLBE appears to have resulted in significant increases in HRV during the laboratory relationship task. This extends previous research on the impact of brief breathing interventions on ER and on increasing HRV (Bornemann et al., 2015; Prinsloo et al., 2011; Roberto et al., 2018; Shearer et al., 2016; Zaccaro et al., 2018). In addition, this study introduced a novel breathing intervention, the GNLBE, that seems to impact HRV. Previous research shows that acute interventions demonstrate improvement in ER capacities (Bornemann et al., 2015; Howarth et al., 2019; Shearer et al., 2016). In a five-minute biofeedback HRV exercise, which increases HRV in the HF domain, altruistic behaviour improved significantly on multiple games and scales (Bornemann et al., 2016), linking ER to prosocial behaviour. In a different context, a 10-minute HRV biofeedback exercise, where participants practised controlled breathing at the resonance frequency (between 4.5-6.5 breaths per minute), showed a significant decrease in anxiety in participants and an increase in positive emotions versus a comparative group (Prinsloo et al., 2013b). Moreover, participants responded faster on a modified Stroop task without making any more errors after the HRV biofeedback intervention. Notably, compared to the comparative control, the participants were more alert post-intervention (Prinsloo et al., 2011). To assess the impact of a short-form MBSR intervention – one hour weekly for four weeks versus two hours weekly

and eight weeks – a marker of HRV, SDNN, increased significantly in the MBSR group versus an active control group with a therapy dog and a passive control group (Shearer et al., 2016). These three studies uphold the impact of short-breathing interventions on improving HRV. In this study, the GNLBE was incorporated as a three-minute segment within the nine-minute relationship stressor task within the laboratory protocol. This acute intervention appears to show the impact of the GNLBE on HRV measures and its effect on ER in the post-relationship stressor segment of the task. The relationship task reproduced a relationship stressor exercise in week four of the TBRH intervention, which replicated an imagined real-world stressful conversation pre- and post-the GNLBE. Results showed SDNN increased significantly during the GNLBE both pre- and post-intervention. Post-intervention SDNN remained significantly improved in the post-stressor task (the second part of the stressful conversation), which demonstrated that the SDNN was significantly greater in the second stressful conversation versus the first stressful conversation. This may indicate the durability of the effect of the breathing intervention during the second stressful conversation. Similarly, the lnLFP in the cardiac spectrogram of the participants increased significantly during the GNLBE both pre- and post-intervention and remained significantly greater in the second stressful conversation versus the first stressful conversation both pre- and post-intervention. Additionally, lnTP in the cardiac spectrogram of the participants followed the same pattern as lnLFP and increased significantly during the GNLBE both pre- and post-intervention and remained significantly greater in the second stressful conversation versus the first stressful conversation both pre- and post-intervention. These results appear to reinforce the validity of short breathing interventions on increasing indices of HRV. Interestingly, in a study which assessed three brief daily interventions, HRV biofeedback, mindfulness meditation and physical exercise, results improved for mindful awareness and attention control for all groups regardless of the type of intervention (de Bruin et al., 2016). HRV biofeedback, mindfulness meditation and physical exercise share a breathing component (deep breathing, focused attention on the breath or increased breathing), which enhances body awareness and, in turn, ER (de Bruin et al., 2016). Moreover, all three interventions share an attentional component, the combination of which, with breathing, leads to improved ER (de Bruin et al., 2016). This study further supports the efficacy of the impact of acute interventions on attention and emotional control into which the GNLBE establishes itself.

A comprehensive systematic review of brief MBIs, which included 85 studies proved a range of health outcomes which included ER, enhanced cognitive performance and

improved stress management. All, except for one study in this review, were gold-standard RCT; two-thirds were sufficiently powered, and half were breathing interventions, (Howarth et al., 2019). The results in this study appear to substantiate these findings for improved ER and stress management within a stressful relationship conversation. This seems to further validate the target mechanism of parasympathetic activation within the GNLBE, which was designed specifically for relational contexts. It is important to highlight that the GNLBE is a 4-minute intervention which indicates significant changes in most HRV measures. This contributes to an emerging literature that the duration of the intervention is not significant for improving emotional flexibility and regulation in stressful contexts (Bornemann et al., 2015; Brown et al., 2022; Radmark et al., 2019). Frequency of practice is cited as more important than the length of practice (Taylor & Millea, 2016), a finding reiterated by Bornemann and colleagues, who verify that time is not a significant variable for change but rather the frequency of practice and, in addition, the likability of the intervention (Bornemann et al., 2015). In a meta-analysis of MBIs on HRV, the duration of the intervention was a non-significant variable (Brown et al., 2022). The GNLBE appears to emerge as an additional brief tool to activate ER.

Existing literature has evidenced breath as a key mechanism for ER (Doll et al., 2016; Jerath et al., 2006; Levinson et al., 2014; Zaccaro et al., 2018). Breathing initiates the mechanisms of internal awareness of bodily signals, self-awareness, self-monitoring, and self-regulation (Bing-Canar et al., 2016; Busch et al., 2012; Jerath et al., 2006; Lutz et al., 2008). The effect of breath practices on psychological flexibility and ER amidst stressors has emerged as a key mechanism within behavioural interventions (Shapiro et al., 2008; Tang & Posner, 2012b; Zaccaro et al., 2018). The GNLBE appears to extend this research on the adaptive regulation capacities developed through breathing interventions, specifically in stressful relational contexts.

The qualitative findings in this study reinforced the HRV evidence. Participants described their experience of becoming calm through the GNLBE and how this serenity initiated becoming present in the moment and learning to pause before responding. This upholds previous research on the impact of MBIs on calm and ER (Frank et al., 2019; Pearson, 2019; Yavuz Sercekman, 2024). In a pilot study with incarcerated youths, participants described improvements in their ability to self-regulate and inhibit impulsive decisions in favour of healthier responses (Himelstein et al., 2015). In a contrasting

population, in which mindfulness was incorporated into the workplace, participants were less reactive and retaliatory to unfair treatment by a supervisor than the control group (Long & Christian, 2015b). The studies above take place in contrasting contexts and with diverse populations, yet they share participants' development of ER through mindfulness about inhibiting less optimal behaviours. The mechanism within the GNLBE reflects these same results of calm and ER. Within the TBRH study, the GNLBE was practised weekly in the group for four minutes, and participants were encouraged to practice the exercise daily for one to four minutes on their own at home. In addition, the exercise is utilised in Weeks 4 and 5 within a real-world imagined stressful conversation and within role play, respectively, to activate the regulatory mechanism of the breathing tool within stressful relationships. The GNLBE was cited unanimously by participants and across the data as a tool responsible for improving their relationships, citing that the calmness engendered active listening as well as an improved communication style, both of which enhanced connection. Participants recounted how the GNLBE equipped them to feel supported in stressful social engagements in which they needed to show up and which would normally trigger their threat reactivity. As a result of the GNLBE, they felt supported in these situations and were able to show up in a healthier manner. This substantiates previous research in MBIs, which improves relationships through the impact of their regulatory mechanisms (Aeschbach et al., 2021; Frank et al., 2019; Keyworth et al., 2014; Sapthiang et al., 2024). In a study by Sercekman on the sustained impact of an MBSR intervention, increased awareness formed a theme which described being able to be more mindful and present in the moment within interpersonal engagements (Yavuz Sercekman, 2024). This included interpersonal engagements related to both work and personal life. In addition, participants spoke about cultivating a sense of inner calmness and consequently were better able to emotionally regulate themselves and experienced more resilience in the face of stressful situations (Yavuz Sercekman, 2024). Furthermore, participants favoured the breath awareness practices and shared the impact of these on their relationships, engendering better communication skills and increased empathy and depth within their social relationships (Yavuz Sercekman, 2024). These sentiments were echoed in this study, with participants citing the GNLBE as the vehicle for instigating profound relational changes. This proffers exciting findings for a new and brief breathing intervention.

5.2.3 Associations between questionnaire data and HRV measures

Significant confirmatory associations appear to be found within this study, indexing IAw, ER, and improved RH. Significant associations were indicated between the participants' scores on sub-scales of the MAIA-2 ('Not-Worrying' and 'Trusting'), and FFMQ ('Observing' and 'Acting with Awareness') and changes in their indices of HRV. Significant associations were also indicated between participants' scores on the SCS subscale, 'Over-identification', and the proportional changes in their indices of HRV and between the participants' Total Score of the SCS and the proportional changes in their indices of HRV.

While many studies show changes in indices of HRV as a measure for cognitive and ER and autonomic outflow (Brown et al., 2022; Lane et al., 2009; Park & Thayer, 2014; Thayer & Lane, 2009), there remains little evidence for associations between changes in the self-report measure of IAw (MAIA-2) and changes in indices of HRV as well as changes in dispositional mindfulness (FFMQ) and changes in indices of HRV. Both these self-report measures, while distinct from each other, assess cognitive appraisal of interoceptive signals and the integration and regulation thereof (Hanley et al., 2017). The MAIA-2 measures distinct constructs of IAw that encompass the adaptive regulatory capacities of interoception in addition to the appraisal mechanisms within IAw (Mehling, 2016, 2018; Mehling et al., 2012). Interoceptive sensibility, which encompasses the regulatory elements of IAw, has been associated with the subscales 'non-distracting', 'not-worrying', 'attention regulation', 'self-regulation' and 'trusting' (Elliott & Pfeifer, 2022; Hanley et al., 2017; Suzuki et al., 2021).

In assessing the impact of IAw on better management of the COVID-19 pandemic, studies found that interoceptive sensibility in which they included the MAIA-2 subscales 'Not Worrying', 'Self-Regulation', 'Attention Regulation', and 'Trusting', were associated with less anxiety and improved psychological adaptability (Elliott & Pfeifer, 2022; Suzuki et al., 2021). This is echoed in a longitudinal study in which Vabba and colleagues measured the impact of the COVID-19 pandemic on interoception for health and well-being, using various models of interoception (Vabba et al., 2023). These included the heartbeat counting task to measure interoceptive accuracy and the MAIA-2 to measure interoceptive sensibility. RMSSD, an index of HRV decreased during the pandemic, while individual differences in interoceptive accuracy correlated significantly with their RMSSD values (Vabba et al., 2023). However, the individual differences in interoceptive accuracy were not correlated with the corresponding individual self-reports on the MAIA-2 and thus an inference for resilience

through interoceptive accuracy may not be correct. However, interoceptive sensibility as measured through the subscales ‘Self-Regulation’, ‘Not-Distracting’, ‘Not-Worrying’ and ‘Trusting’, showed better psychological resilience during this period (Vabba et al., 2023).

This study appears to verify these findings and suggests new evidence in the form of significant associations between the MAIA-2 subscales of ‘Not-Worrying’ and ‘Trusting’ and indices of HRV. Results appear to indicate a moderate positive correlation between ‘Not-Worrying’ in the MAIA-2 and the proportional increase in lnLFP in the participants’ cardiac spectrograms pre- to post-intervention. In addition, results appear to indicate a significant correlation between ‘Trusting’ in the MAIA-2 and lnHFP post-intervention. HFP is an index of vagal activation of the heart denoting parasympathetic activation (Appelhans & Luecken, 2006; Thayer et al., 2012). ‘Not Worrying’ refers to participants being able to accept uncomfortable physiological sensations and feelings and let them go. Items include - ‘*I can stay calm and not worry when I have feelings of discomfort*’ and ‘*When I feel uncomfortable sensations, I just let it go by*’ (Mehling et al., 2018). ‘Not-Worrying’ forms part of the ‘acceptance in action’ cluster in a correlation between the MAIA and FFMQ (Hanley et al., 2017) and embeds cognitive appraisal with mindful acceptance (Cali et al., 2015). In a study to differentiate between the MAIA constructs of IAW and interoceptive accuracy and emotional susceptibility, ‘Not-Worrying’ was associated with decreased emotional susceptibility and increased tolerance of uncomfortable sensations (Cali et al., 2015). Moreover, in the same study, high scores on ‘Trusting’ indicated low emotional susceptibility (Cali et al., 2015). ‘Trusting’ refers to having confidence in the body’s signals, feeling at home in one’s body and trusting the body as a safe place. Items include, ‘*I trust my body sensations*’ and ‘*I feel my body is a safe place*’. ‘Trusting’ has been negatively correlated with depression (Datko et al., 2022; Dunne et al., 2021).

To the very best of our knowledge, these associations have not been found in previous literature and suggest significant evidence for enhanced present moment IAW in the post-intervention laboratory protocol and appear to show significant changes over time. Notably, this study’s laboratory protocols and interventions took place during the second wave of COVID-19 from January to May 2021 (Groups A and B in the waitlist-control design) and between July and August 2021 (Group C, the Breathing Only intervention) in which physiological sensations that might indicate the threat of COVID became heightened. Thus, for participants in Groups A and B to develop ‘Trusting’ in the body, might hold further

significance. These IAw results were enhanced with significant increases in the FFMQ subscale of ‘Acting with Awareness’ from pre- to post-intervention in Groups A and B and ‘Non-Judging of Inner Experiences’ in Group C, as well as ‘Observing’ and ‘Acting with Awareness’ being significantly correlated with indices of HRV across the combined participants post-intervention. There was a weak, but significant positive correlation suggested between ‘Observing’ and the proportional increase in lnTP from pre- to post-intervention and a significant positive correlation suggested between ‘Acting with Awareness’ and lnHFP post-intervention. ‘Observing’ is a cognitive appraisal capacity and similar to ‘Noticing’ in the MAIA-2, if accompanied by a regulatory capacity like ‘Acting with Awareness’, represents mindful awareness and present moment attention (Bornemann et al., 2015).

Meta-awareness is linked to the PFC which inhibits subcortical reactivity and enhances ER (Park & Thayer, 2014; Tang et al., 2015; Tang & Posner, 2012a; Thayer et al., 2012). ‘Acting with Awareness’ is a central tenant of mindfulness and denotes present-moment responding rather than being on autopilot (Baer et al., 2004; Baer et al., 2008). There is scant research on correlations between the FFMQ and HRV. In a study measuring the associations between dispositional mindfulness and HR reactivity and recovery from a laboratory stressor, a small positive association for the total short form FFMQ and ‘Non-Reactivity to Inner Experience’ predicted the severity of reactivity, while there was a small negative correlation with ‘Non-Judgement’ and the time it took for HR to recover to baseline, however, it did not reach significance (Beshai et al., 2020). A study of three five-minute sessions of heart rate coherence showed no associations were found between the FFMQ and HRV (Soer et al., 2015). To our very best knowledge, this is the first study to demonstrate potential associations between ‘Observing’ and ‘Acting with Awareness’ and indices of HRV.

The enhancement in measures of IAw and its possible significant associations with indices of HRV are novel findings.

This was shown by the possible significant association between the post ‘Not Worrying’ scores and the increase in proportion lnLFP from pre- to post-intervention across the combined 34 participants. Further evidence for enhanced IAw is the possible significant association between the post ‘Observing’ scores and the proportional increase in lnTP from pre- to post-intervention. This might provide evidence for the socio-cognitive components of

the TBRH intervention targeted by the ‘Character Analysis 1’ exercise, the ‘Relationship Triggers and Patterns exercise’ and the ‘Biography Worksheet’ in the TBRH intervention.

The qualitative findings provided insight into the possible novel HRV results of the socio-cognitive components of ‘Not-Worrying’, ‘Trusting’, ‘Observing’ and ‘Acting with Awareness’. Participants’ experience of developing cognitive self-awareness amidst triggers and this socio-cognitive capacity of perspective-taking may support the associations in the heart. Extending previous qualitative research, participants described developing self-awareness of their habitual emotional patterns and reactions (Aeschbach et al., 2021; Frank et al., 2019; Pearson, 2019; Shonin et al., 2014; Yavuz Sercekman, 2024). Moreover, in this study, participants articulated their awareness of their emotional triggers as they happened, enabling a downregulation of their reactivity in the moment. They communicated observing their emotional responses within specific stressful relationships and subsequently practised shifting their patterned behaviour through self-awareness and ER strategies, namely the GNLBE. Self-awareness within this study was articulated by participants through a contextualized relational paradigm. Participants described their experience of developing self-awareness amidst their triggers and how this capacity simultaneously downregulated their threat. Furthermore, the awareness provided participants with the understanding of their need to regulate themselves before responding to others, either through using the GNLBE in the moment or attending to their self-care activities prior to engagements. These qualitative findings extend previous research where self-awareness of one’s behaviour develops as a result of MBIs (Aeschbach et al., 2021; Frank et al., 2019; Pearson, 2019; Shonin et al., 2014; Yavuz Sercekman, 2024).

The TBRH intervention might extend previous literature through contextualising self-awareness to the relational paradigm. In the TBRH intervention, reactivity is context-related, and participants gained insight into how to soothe and regulate their reactivity. The vmPFC has been demonstrated to be a key brain region for context-related threat inhibition for the purpose of social flourishing (Damasio & Carvalho, 2013; Damasio, 1996; Damasio et al., 2000). These appraisal methods that develop self-awareness through the exercises within the TBRH intervention – specifically the ‘Character Analysis 1’ exercise in week two and the ‘Relationship Patterning and Triggers exercise’ in week three may activate the vmPFC for self-appraisal to enhance interpersonal engagement. Qualitative research has shown that MBIs improve self-awareness regarding one’s physiology, emotions, and thoughts, which

improves ER in a range of contexts (McIntyre et al., 2017; Sapthiang et al., 2024; Shonin et al., 2014; Taylor & Millier, 2016; Vollestad et al., 2012). The development of awareness of the link between body sensations and emotions has been shown to enable participants to have insight into their inner world (Kabat-Zinn, 2003; Sapthiang et al., 2024; Shapiro et al., 2008). This intrapersonal connection and regulation have been further shown to improve relationships in a range of settings (Bockler et al., 2017; Khoury et al., 2015; Pearson, 2019; Valk et al., 2017).

A consequence of self-awareness within this study was self-acceptance and self-care. This validates previous research about an increase in self-acceptance and the prioritisation of what was important in participants' lives (Aeschbach et al., 2021; Sapthiang et al., 2024; Shonin et al., 2014). In an MBI tailored for physicians, participants recounted their development of increased equanimity which fostered the prioritisation of their self-care regarding taking time to eat at work and short breaks when needed. Consequently, this led to improvements in their relationships with patients and colleagues as well as personal relationships (Aeschbach et al., 2021). This sequence of self-awareness leading to self-care and consequently improving relationships is shown in previous qualitative research on MBIs (Draper-Clarke, 2014; Frank et al., 2019; Shonin et al., 2014) and was replicated within this study.

The TBRH and GNLBE may serve to develop both socio-cognitive capacities for perspective-taking as well as somatosensory capabilities for present-moment attention. ER is arrived at through a combination of bottom-up and top-down processes. The significant increase in trusting the body as a safe place pre- versus post-intervention and the indication of the significant positive correlation between the 'Trusting' scores and lnHFP during the post-intervention laboratory session is indicative of significant mind-heart synchrony for ER. Scientific research on the benefits of theatre practice is new and in its infancy. Evidence is beginning to show the benefits of acting training in developing TOM and social cognitive processes of empathy (McDonald et al., 2020). Moreover, ER strategies are developed as actors learn to simultaneously embody the physiological and emotional states of their character while observing and regulating their own perspectives (Goldstein & Lerner, 2018; McDonald et al., 2020). Interestingly, performance research uses EEG neurofeedback and HRV biofeedback to enhance flow and presence in performance (Gruzelier et al., 2010). Most of the research on the benefits of actor training has been done in the area of improvisation

with regard to growing adaptability and flexibility with adults in business (Schwenke et al., 2020) and developing ER capabilities in young children and adolescents (Goldstein & Bloom, 2015; Goldstein & Lerner, 2018). There is enormous scope for research on the benefits of acting training and specifically to develop IAW for mental training programmes.

5.2.5 Self-Compassion Scale and HRV evidence self-soothing and social engagement behaviour

Previous studies show correlations between an increase in self-compassion as measured by the SCS with an increase in social approach behaviours and interpersonal engagement behaviours and the activation of the mammalian care system (Bornemann et al., 2016; Dahm, 2017; Rockliff et al., 2008; Sloan et al., 2017). Self-compassion has been linked to improved social soothing behaviours, improved altruism, improved approach and motivational behaviours and extends ER into action (Biber & Ellis, 2017; Dahm, 2017; Neff, 2016a).

Previous research has found correlations between self-compassion and an increase in vagally mediated HRV (Bornemann et al., 2016; Kok et al., 2013; Rockliff et al., 2008). Porges postulated the phylogenetic evolution of the PNS for social flourishing in his Polyvagal Theory (Porges, 2003; Porges, 2007, 2009). This alternate pathway promotes social bonding, social soothing and social approach behaviour (Porges, 2009). A study which measured HRV in conjunction with compassion-based imagery to assess the impact of the imagery on participants with a secure attachment style and healthy self-esteem versus participants with an insecure attachment style and high levels of self-criticism showed an increase in SDNN for the secure attachment group and a decrease in SDNN for the insecure and high self-critical group (Rockliff et al., 2008). Compassion-focused imagery can be difficult for those with insecure attachment (Rockliff et al., 2008) In a healthy population there were significant increases in indices of HRV through a five-minute biofeedback task, which correlated with an increase in altruistic behaviour as measured through a range of computer games and questionnaires that assessed altruistic behaviour in stressful situations (Bornemann et al., 2016). Researchers who assessed two brief self-compassion interventions using self-report measures and HRV found the HRV indices increased significantly and corresponded to reduced self-criticism, increased self-soothing and self-kindness when stressed and, importantly, increased social connectedness (Kirschner et al., 2019). Svendsen and colleagues (2022) disentangled the impact of dispositional self-compassion from mindfulness by using HRV to distinguish between the two constructs. Results verified a

significant positive correlation between the Total Score of the SCS and a marker of HRV. The same did not apply to dispositional mindfulness (Svendsen et al., 2022). Self-compassion presents itself as a mechanism for improving self-soothing and social engagement.

The present study further suggests the connection between self-compassion and HRV and the implications of self-soothing behaviours in response to threats and increased social engagement behaviours. This is important in the context of this study, where RH is indicated by interpersonal approach behaviours, self-soothing and social engagement behaviours within stressful relational contexts. Results showed a possible positive association between the increase in the participants' Total Score of the SCS from pre- to post-intervention and the lnTP in their cardiac spectrograms post-intervention. Moreover, this study tends to support the research on self-compassion as a mechanism for the development of self-soothing and social engagement capacities. The TBRH intervention targets social connection through self-soothing, regulating and integrating the different parts of oneself. This mechanism serves to develop a meta-cognitive perspective of the different parts of self and what contexts- and relationship dynamics activate them. This learning leads to related self-soothing and regulation behaviour that is unique to each participant. The GNLBE is designed as a vehicle for improved social engagement. The mechanism of self-compassion has been shown to develop self-soothing, self-care and social connection (Böckler et al., 2016; Kirschner et al., 2019; Kok et al., 2013; Singer & Engert, 2018; Valk et al., 2017). The TBRH intervention seems to have both supported these findings with increased self-compassion being evidenced at a psychophysiological level and possibly extended these findings with a new behavioural intervention. In the TBRH intervention, early caregiver dynamics were explored through an embodied process in which participants experienced the felt sensation of the relationship dynamic in relation to physiological sensations, corresponding emotions and corresponding thoughts or thinking patterns. This was repeated three times for three different early caregiver relationships. Participants then explored how the relationship patterns might be playing out in current relationships. Future research may investigate the TBRH intervention as a vehicle for improving attachment style and healing from adverse early childhood experiences.

The TBRH and GNLBE interventions suggest that they effected a positive association between the participants' Total Scores on the SCS and the lnTP in their cardiac spectrograms post- intervention extending previous research (Kok et al., 2013; Rockliff et al., 2008). Qualitative findings demonstrated participants' experience of significant positive developments in their relationships, specifically self-soothing behaviours and interpersonal

engagement. The improvements in their Total Score of the SCS potentially supports the qualitative accounts of the participants.

5.2.6 The MAIA-2, FFMQ and SCS evidence IAw and ER

Significant increases pre- versus post- the TBRH intervention for both IAw and ER were indicated through the MAIA-2, FFMQ, and SCS in this study. All questionnaires underwent Cronbach Alpha tests and demonstrated good to excellent internal reliability and correspond well to other MBI studies (Bornemann et al, 2015; Mehling 2018; 2017; Williams et al, 2014).

For IAw, significant changes were seen in the regulatory subscales of ‘Self-Regulation’ and ‘Body Listening’ on the MAIA-2. This confirms and extends existing research in which MBIs shows significant development of the regulatory capacities of IAw, specifically the sub-scale ‘Self-Regulation’ (de Jong et al., 2016; Mehling et al., 2018). In a study on the impact of an integrative exercise program which incorporated breathing, yoga and attitudinal principles from mindfulness, war veterans with PTSD showed the strongest significant improvement on the ‘Self-Regulation’ and ‘Body-Listening’ sub-scales of the MAIA (Mehling et al., 2018). Similarly, in a study with patients with chronic pain and co-occurring depression, an MBCT intervention showed significant improvement in the ‘Self-Regulation’ subscale of the MAIA (de Jong et al., 2016).

These interventions, which are situated in diverse contexts and target diverse physical and mental maladaptation’s, from a reduction in PTSD to a decrease in chronic pain, achieve their outcomes through the regulatory mechanisms embedded within IAw. The TBRH intervention targets RH and it is the same IAw mechanisms that affect appraisal, integration and regulation within relationships. Perhaps the closest study in which to situate the TBRH intervention relating to the mechanisms targeted through the training is the Resource Project, a 9-month contemplative mental training program. It comprises three modules of three months each – an interoception and presence module (the body scan and focus on breath meditation), a socio-affective module (LKM and gratitude practices in dyads) and a socio-perspective module (observing thoughts meditation and perspective-taking exercises on self and other in partners). The ‘Self-Regulation’ subscale on the MAIA showed the largest effect size for improvement after three months of interoceptive and presence training (Bornemann et al., 2015). Comparatively, the TBRH intervention indicates changes for ‘Self-Regulation’

on the MAIA-2 in six weeks. Perhaps the combination of somatosensory and socio-cognitive exercises produces these significances in this shorter period. These effects contribute to the literature on the duration of intervention time not being a criterion for hindering mechanisms of change targeted within MBIs (Brown et al., 2022). ‘Self-Regulation’ denotes the regulation of aversive emotions and sensations through the body, and ‘Body Listening’ infers using the body to understand emotions and impulses and the behaviour required to move into balance. This combination of scales points to the importance of the regulatory component of IAw in promoting adaptive behaviour and psychological flexibility (Mehling, 2016). Moreover, it distinguishes between healthy interoception versus maladaptive interoception and extends the literature on MAIA-2 as a measure for healthy IAw for MBIs and mind-body therapies. The changes in the MAIA-2 situate the TBRH intervention as potentially effective to the mechanisms within MBIs that develop IAw and ER. Moreover, it suggests that adaptive character development exercises cultivate IAw.

In addition to the regulatory scales on the MAIA-2, the regulatory scale ‘Acting with Awareness’ increased on the FFMQ in Groups A and B but not in Group C. There is an overlap between the MAIA-2 measure of IAw and the FFMQ measure of dispositional mindfulness (Hanley et al., 2017). Both have constructs that measure cognitive appraisal of body sensations and emotions as well as the regulation of these physiological sensations and feelings when experienced as uncomfortable or aversive. ‘Acting with Awareness’ signifies present-moment attention to one’s actions versus being on autopilot (Baer et al., 2008). ‘Acting with Awareness’ is a central mechanism within mindfulness (Kabat-Zinn, 2003; Querstret et al., 2020; Shapiro et al., 2008). Group A was the only group in which the ‘Observe’ subscale of the FFMQ moved into significance six weeks post-intervention. This may indicate more cognitive appraisal capacity within this group, or it may be as a result of being the only group to be measured six weeks post-intervention. In this study, ‘Acting with Awareness’ improved significantly in Groups A and B, possibly indicating the growth of presence, a key mindfulness attribute, as a result of the TBRH intervention.

As indicated by the results above and demonstrated in previous studies, IAw encompasses regulatory capacities. Thus, ER is addressed within the MAIA-2 and further substantiated through ‘Acting with Awareness’ on the FFMQ which signifies present-moment attention and forms a key mechanism for ER in MBIs (Kabat-Zinn, 2003; Shapiro et al., 2008; Vago & Silbersweig, 2012). ER describes the ability to be flexible and adaptive in

changing environments (Appelhans & Luecken, 2006; Hoge et al., 2021). Importantly, the significant increases in the ‘Total Score’ of the SCS in Groups A, B, and C, further suggest ER. The paradigm of self-compassion incorporates mindful regulation (Braehler & Neff, 2020; Dahm, 2017; Neff, 2023; Neff & Germer, 2013) and thus verifies ER. Furthermore, studies show the mindful regulation capacity within the construct of self-compassion to surpass ER through activating motivational capacities for altruistic and pro-social behaviour (Braehler & Neff, 2020; de Bruin et al., 2016; Neff, 2023).

In this study, ER was suggested by the combination of the MAIA-2 and FFMQ regulatory subscales together with the mindful regulation capacities embedded in the significant increase in the Total Score of the SCS.

It is interesting to note that there were increases of the regulatory capacities indicated through the GNLBE-only intervention (Group C), which may be a consequence of the target being specifically focused on regulation only. For the FFMQ, ‘Non-Judging of inner Inexperience’ increased significantly which extends previous results in MBI’s (Bornemann et al., 2015; de Jong et al., 2016; Mehling et al., 2018). Again, this is a four-minute practice versus much longer practices and interventions within these cited studies. The SCS changes replicated those of Groups A and B, substantiating mindful regulation as an essential component of self-compassion (Dahm, 2017; Neff, 2023; Neff & Germer, 2013). Group C is the only group with a significant decrease in state anxiety as evidenced by the STAI-S. This extends previous research on breathing interventions reducing state anxiety (Howarth et al., 2019; Prinsloo et al., 2013b; Shearer et al., 2016). These results indicate that the GNLBE exercise might be the dominant mechanism of change in the TBRH intervention.

The within-group changes pre- versus post-intervention show almost identical results for Groups A and B. The ANOVA and Friedman ANOVA tests showed increased and additional subscale significance, however this was lost when the more refined and granular t-tests were run and to best determine effectiveness we regarded the more refined tests. There were significant differences over time for the ‘Self-Regulation and ‘Body- Listening’ subscales of the MAIA-2, in ‘Acting with Awareness’ in the FFMQ, in the ‘Over-Identification’ subscale, and the ‘Total Score’ of the SCS for Groups A and B. These results are similar to Bornemann and colleagues (2015), who used the MAIA to measure IAw pre- and post-intervention practising of the body scan and the focus-on breath meditation daily for

three months as part of a large-scale nine-month longitudinal contemplative mental training program. Notably, this study showed similar results within a six-week intervention and differentiated itself through the addition of the meta-cognitive subscales, a construct which is targeted within the six weeks of the TBRH intervention through adapted character development exercises. Increasingly, research is showing that shorter interventions are as successful as long-term interventions (Howarth et al., 2019).

For Group A we saw changes in the regulation sub-scales, i.e., ‘Self-Regulation’ and ‘Body Listening’ (Bornemann et al., 2015; Mehling, 2016), as it occurs within this study, and with the addition of a strong trend for an increase in the regulation subscale ‘Trusting’.

‘Self-Regulation’ describes using the body and breath to calm oneself (Mehling, 2018; Mehling et al., 2012). It is the dominant construct that shows significant improvement followed by ‘Body-Listening’ within MBIs (de Jong et al., 2016; Mehling et al., 2018). ‘Body-Listening’ showed a significant increase indicating that participants listened to their bodies for cues both on their current emotional state and what behaviour was required to bring them into balance. These results echoed research by Bornemann and colleagues, which aimed to measure the effect of a three-month training module which targeted improving IAw through the body scan and focus-on-breath meditations and using the MAIA as the tool for measurement (Bornemann et al., 2015). Interestingly, the GNLBE incorporates listening to sensations in the belt or core area and activating this area through breath and colour visualisation. This is akin to a body scan in which listening to sensations throughout the whole body is practised, except that it is focused within one area and combined with activating the area through breath. Trusting the body as a safe place has been inversely related to depression and MBIs have been shown to change this in moderate to severe depression (Datko et al., 2022; Dunne et al., 2021).

The FFMQ suggested significant increases for the subscale of ‘Acting with Awareness’. Results suggest the possible development of mindful IAw through the cognitive appraisal of body sensations, emotions and thoughts and the subsequent integration and regulation of them. Notably, present-moment attention is a mechanism that is developed within MBIs and the TBRH intervention.

Group B evidenced the same changes as Group A. In the FFMQ, the ‘Acting with Awareness’ subscale increased significantly. Moreover, these results were the same as Group C. Many of the participants for Group B and C were recruited from those who had been previously excluded owing to PTSD and for the remaining prospective participants, PTSD was no longer a screening measure. This may account for the significant decrease in STAI-S anxiety in Group C and the tendency for a significant decrease in STAI-S for Group B.

For Groups A and B, the SCS results showed a significant decrease in ‘Over-identification’ as well as a significant increase in the ‘Total Score’ of self-compassion. A decrease in ‘over-identification’ shows an ability to let things go rather than become fixated on feelings and thoughts (Neff, 2003; Neff, 2023; Neff & Germer, 2013).

The TBRH intervention targeted somatosensory and socio-cognitive capabilities. Exercises were designed to target IAw, acceptance and regulation of emotions, perspective-taking of self and other, social approach, and engagement behaviours. The HRV correlations results suggest growth in IAw together with the MAIA-2 and FFMQ and the personal accounts of the participants. HRV appeared to indicate ER through the GNLBE in the acute intervention in the laboratory. Moreover, ER showed significant increases through the MAIA-2, FFMQ, and SCS together with the participants’ descriptions of their experience and utilisation of the GNLBE. Finally, RH was demonstrated in the changes in IAw and ER within the context of stressful relationships and specifically through the participant interviews in which they described their progress in RH both within themselves and with significant others. The SCS appears to further validate an increase in self-soothing and social engagement through the HRV associations with the SCS and with the increase in the Total Score of the SCS.

5.3 Limitations of the Thesis Research

There were several limitations within this study. The pilot study did not include demographic measures. The sample size for study 2 was small at the outset and not sufficient to allow for inevitable fallout, thus reducing the strength of producing comprehensive evidence. Randomisation was not included, nor was there an active control condition. This inhibited the generalisation of the results in this study and reduced its internal validity. The waitlist-control design is a robust methodological procedure (Christodoulou et al., 2020; Davidson & Kaszniak, 2015); however, it uses a passive control group which is less optimum

than an active control group, particularly in MBIs (Christodoulou et al., 2020). Moreover, the anticipatory impact was evidenced in the control group (group B) prior to the participants receiving the intervention post-Group A. Furthermore, there was no protocol for blinding participants to the desired outcomes of the intervention.

Importantly, during recruitment, participants were initially excluded for PTSD both in the pilot study and in the main study. Subsequently, with the arrival of COVID-19, PTSD was removed as an exclusion criterion, and some of the participants for group B and group C were recruited from this previously excluded pool. Participants for Group C were recruited without the PTSD measure. This may have influenced the similar results between Group B and C on the self-report measures.

Moreover, the PCL-5 was not administered post-intervention nor controlled for in the analysis for any of the participants. The combination of participants with and without PTSD may have impacted the results, and furthermore, accounting for PTSD may have produced interesting support for the TBRH intervention. While participants were recruited from the public, a high level of education was averaged within the three cohorts. Accordingly, the results may be skewed in this regard, and a more representative sample may produce different results. The small sample size impacted the HRV results. Owing to six participants being lost in the statistical analysis phase due to noise in the electrocardiogram, the remaining participants were combined into a single-arm study to sufficiently power the statistics. Thus, the more robust quasi-experimental waitlist design became a single-arm study. In addition, Body Mass Index (BMI) and age were not controlled for in the statistical analysis for HRV. These factors impact the HRV recording, and best practices incorporate them into the analysis (Christodoulou et al., 2020; Quintana & Heathers, 2014; Shaffer & Ginsberg, 2017). Methodological considerations when using HRV as a measure are widely varied and contribute to the complexity of interpreting cohesive results (Quintana & Heathers, 2014; Shaffer & Ginsberg, 2017). The laboratory protocols and interventions took place during COVID-19. Thus, participants were wearing masks during the laboratory protocol. This may have negatively impacted the breathing and relationship stressor task, which might have reduced the impact on HRV. Surgical masks are found to increase HR as the mask creates a resistance to breathing (Grimm et al., 2022). Furthermore, the relationship task is a new emotional stressor task that has not been previously tested. However, it served as the core

exercise in week four of the program and elicited strong outcomes within the session and post-session feedback.

There was no direct quantitative measure for RH, a main target of the TBRH intervention. However, the qualitative findings directly explored personal accounts of changes in participants' lived experience of RH at a granular and nuanced level. Interviews were not conducted with the Breathing Only Group; thus it was not possible to assess whether their RH had been impacted. It would have been valuable to assess participants' experiences of the breathing intervention and to learn how their relationships changed before and after the intervention. This would have provided clarification as to whether there were fine-grained differences between the TBRH intervention and the Breathing Only intervention with regard to participants' experiences of their RH. This would have allowed one to distinguish between the two interventions. A further limitation is that there was no control TBRH intervention without the GNLBE. Given the acute impact that breathing has on HRV it would have been informative to examine the difference of the TBRH on HRV versus questionnaire correlations with and without the GNLBE.

Homework compliance was not measured nor accounted for in contributing to the results. It has become evident that daily practice impacts the development of mindfulness attributes (Bornemann et al., 2015). This detail would have contributed to the details of the mechanisms of change in the TBRH and Breathing Only interventions.

Finally, the PhD candidate developed and facilitated both the TBRH intervention and Breathing Only intervention which may serve as a source of bias in this study. Having developed the interventions, the PhD candidate was invested in them achieving their targets. The supervisory sessions with Ereshia Benjamin may have served to mitigate this bias. Moreover, the PhD candidate conducted the laboratory protocols as well which may have relaxed participants as they were known to her.

While the HRV evidence is significant in this study and has been suggested to be associated with questionnaires assessing changes in IAw and ER, it will be of further benefit to extend the measurements for the neural correlates to EEG, fMRI, or rCBF measures.

5.4 Implications of the thesis research and future research

This thesis research might have important implications for policy. With relational divides increasing globally, it might be pertinent to roll out the TBRH intervention within different contexts to better equip people to navigate their relational worlds and be able to hold polarity and difference. Within schools The TBRH intervention can equip young people with tools to become self-aware and learn to regulate emotions within stressful relationships, to better navigate their interior and exterior worlds. The theatre component might make it an accessible and enjoyable intervention for teenagers and other school-going populations. Moreover, the perspective-taking and compassion building skills embedded within the intervention can contribute to navigating their home and peer relationships and managing conflict.

In addition to schools, the TBRH intervention may contribute to leadership skills and conflict resolution within the corporate space, with the aim of improving relational acumen, mental well-being and decreasing burnout as a result of better relationships. Self-awareness of one's emotional triggers and relational patterning is essential to navigate the diversity of people that inhabit the corporate space. The GNLBE produced significant results possibly equal to the TBRH intervention. This is a four-minute breathing tool and may hold useful benefits in the high time pressured environment of the workplace.

While the results in this study demonstrate that the TBRH intervention may successfully target RH and its central components of IAw and ER, it would be beneficial to conduct a randomised control trial with an active control group and a much larger sample size to better understand the impact of the TBRH intervention. This will enable the thesis findings to be validated or invalidated as well as allow for insight into the larger scope for the intervention. Moreover, given the results for the GNLBE, it will be valuable to conduct an RCT using only the GNLBE for development of IAw and ER and RH to learn the exact effect and impact of the GNLBE.

Future research might benefit from assessing the TBRH intervention in clinical populations, specifically those with anxiety, depression, PTSD and insecure attachment styles who are prone to high levels of self-criticism and perfectionism. With MBIs' history of success with anxiety, depression and PTSD (Vollestad et al, 2012; Tsang et al., 2015), the embodied nature of the intervention lends itself to potential success within these populations.

Moreover, the added component of experiential exercises derived from theatre pedagogy, might aid the engagement with processes of embodiment and perspective-taking. Furthermore, given the suggested results for regulation from the GNLBE, it is worth testing whether it reduces anxiety.

5.5 Conclusion

This study introduces evidence for a new behavioural intervention, the TBRH intervention. The TBRH intervention appears to have demonstrated the development of IAw and ER to improve RH in the context of stressful relationships. There appeared to be significant associations between post-questionnaire changes in the MAIA-2 and FFMQ and changes in HRV. These results suggest IAw and present moment attention are reflected in the heart. These are novel outcomes. Additionally, extending previous research, this study also indicates significant associations between post-intervention changes in the SCS Total Score and changes in HRV. IAw and ER are possibly further validated through the MAIA-2, FFMQ, and SCS and are in line with previous research. Finally, the qualitative findings describe profound positive shifts and improvements in how participants understand and experience their RH. Participants narrated their experiences of improvements in their relationships with significant others – ranging from intimate, familial, parental, and collegial relationships. Moreover, participants recounted the development of self-worth, self-acceptance, and self-care with regard to their relationship with themselves. The outcomes in this study extend extant research on MBIs that develop IAw and ER. The TBRH intervention and the GNLBE extend research in the field of contemplative science through the addition of a new novel intervention. Moreover the intervention, situated within the MBI literature, successfully incorporates theatre pedagogy as a mechanism to develop IAw. Additionally, this thesis extends the literature the benefits of mental training programs that encompass embodied processes. This thesis research contributes preliminary positive evidence for a new and novel behavioural intervention, the TBRH intervention, which improves RH through developing IAw and ER in stressful relationships. This intervention situates itself within MBIs and directly targets RH, a gap in MBI interventions. Additionally, the intervention incorporates theatre pedagogy, and the results suggest that theatre pedagogy develops socio-cognitive capacities of perspective-taking and empathy through developing IAw within relational contents. This suggests a useful socio-cognitive mental training to incorporate within MBIs to benefit clinical and non-clinical populations. This thesis contributes both novel and corroborative findings within the literature on MBIs and contemplative science.

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Appendix A

Recruitment Advertisement for Pilot Study

Pilot study for the feasibility and acceptability of a Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no.068/2019)

ADVERTISEMENT

Are you interested in improving your relationship with yourself and others?

I will be running a pilot study to investigate the feasibility and acceptability of a Theatre-Based Relational Health intervention as part of my doctoral study in Neuroscience at the University of Cape Town, which aims to test whether a Theatre-Based Relational Health (TBRH) intervention entrains interoception and emotion regulation for regulated communication to improve relational health.

The Theatre-Base Relational Health intervention aims to provide the following training

- Enhance self-awareness to improve relational health
- Enhance emotion regulation to improve relational health
- Learn to understand your relational patterns and to identify the effects of different relational environments on your physiology, emotions and thoughts.
- Learn to improve your relational health through the regulation of your emotions with self-awareness

If you would like to find out more and whether you are eligible to participate, please contact Ruth Levin-Vorster on email, and she will get back to you

Email address for Ruth: **LVNRUT002@myuct.ac.za**

Appendix B

Abbreviated PCL-C

This Abbreviated PCL-C is a shortened version of the PTSD Checklist – Civilian version (PCL-C). It was developed for use with in primary care or other similar general medical settings. Professional judgment should be used in generalizing it to other settings or if using the Military or Specific versions of the PCL. The initial development of the measure is presented in:

Lang, A.J., Stein, M.B. (2005) An abbreviated PTSD checklist for use as a screening instrument in primary care. *Behaviour Research and Therapy*, 43, 585-594

Additional psychometric information about this measure is available in:

Lang, A. J., Wilkins, K., Roy-Byrne, P. P., Golinelli, D., Chavira, D., Sherbourne, C., Rose, R. D., Bystritsky, A., Sullivan, G., Craske, M. G., & Stein, M. B. (2012). Abbreviated PTSD Checklist (PCL) as a Guide to Clinical Response. *General Hospital Psychiatry*, 34, 332-338.

You can generate 2 brief versions by extracting the instructions, items and response choices from the PCL-C (which is included in this document):

- The **2-item version** consists of items 1 and 4. An individual is considered to have screened positive if the sum of these items is 4 or greater.
- The **6-item version** consists of items 1, 4, 7, 10, 14 and 15. An individual is considered to have screened positive if the sum of these items is 14 or greater.

Appropriate citation of the Abbreviated PCL-C would include references to the above papers (Lang & Stein, 2005; Lang et al., 2012) as well as to the full PCL (Weathers, Litz, Herman, Huska, & Keane, 1993).

The complete reference for the PCL is:

Weathers, F., Litz, B., Herman, D., Huska, J., & Keane, T. (October 1993). The PTSD Checklist (PCL): Reliability, Validity, and Diagnostic Utility. Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio, TX.

PCL-C

The next questions are about problems and complaints that people sometimes have in response to stressful life experiences. Please indicate how much you have been bothered by each problem in the past month. For these questions, the response options are: “not at all”, “a little bit”, “moderately”, “quite a bit”, or “extremely”.

		Not at all	A little bit	Moderately	Quite A Bit	Extremely
PCL1	Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?	1	2	3	4	5
PCL2	Repeated, disturbing dreams of a stressful experience from the past?	1	2	3	4	5
PCL3	Suddenly acting or feeling as if a stressful experience from the past were happening again (as if you were reliving it)?	1	2	3	4	5
PCL4	Feeling very upset when something reminded you of a stressful experience from the past?	1	2	3	4	5
PCL5	Having physical reactions (e.g., heart pounding, trouble breathing, sweating) when something reminded you of a stressful experience from the past?	1	2	3	4	5
PCL6	Avoiding thinking or talking about a stressful experience from the past or avoiding having feelings related to it?	1	2	3	4	5
PCL7	Avoided activities or situations because they reminded you of a stressful experience from the past?	1	2	3	4	5
PCL8	Having trouble remembering important parts of a stressful experience from the past?	1	2	3	4	5
PCL9	Loss of interest in activities that you used to enjoy?	1	2	3	4	5
PCL10	Feeling distant or cut off from other people?	1	2	3	4	5
PCL11	Feeling emotionally numb or being unable to have loving feelings for those close to you?	1	2	3	4	5
PCL12	Feeling as if your future somehow will be cut short?	1	2	3	4	5
PCL13	Having trouble falling or staying asleep?	1	2	3	4	5
PCL14	Feeling irritable or having angry outbursts?	1	2	3	4	5
PCL15	Difficulty concentrating?	1	2	3	4	5
PCL16	Being “superalert” or watchful or on guard?	1	2	3	4	5
PCL17	Feeling jumpy or easily startled?	1	2	3	4	5

Appendix C

The Bangor Assessment and Guidelines for Mindfulness Interventions

ASSESSMENT AND ORIENTATION

Preparing participants for a Mindfulness-based course

GENERAL OVERVIEW

With all mindfulness-based courses it is important to:

- assess the suitability of the course for participants at this point in their lives
- orientate participants to what the course offers and demands and
- hear about participants' own expectations of the course

This can be done in a group session, or through individual interviews or with a mix of both. It may be possible through your registration process, to check whether would-be participants have suffered or are suffering from any physical or mental ill-health. If this is the case, we have found it is best to give these participants individual interviews.

However, if you are running mindfulness based courses for people with specific difficulties (such as a history of depression, cancer, pain, chronic fatigue etc), you may find that the process of assessment and orientation needs a longer and more individualised approach – starting at the point that the potential participant is referred or makes contact with you over the phone, and going through a process that takes them up to the very start of the course. This might also include a group process, but it is probably essential to ensure that individual meetings take place between participants and teacher.

It is important to consider the particular area of suffering that your course is targeting and who you will be working with. In this way, you can develop a formulation that clarifies your understanding of the focus of the course and the way it will impact on the particular needs and special vulnerabilities of your participant/s. The design of your orientation and assessment process will need to include all of these considerations. It is also important to look at the whole picture – assessing a participant's previous experience of meditation or yoga, current levels of support, and attitude to the course, may make more severe levels of problems more workable. All this information giving, listening and sharing will take time and it is important not to rush the process, whilst balancing this with inevitable practical constraints.

CONSIDERATIONS TO INCLUDE IN THE ORIENTATION AND ASSESSMENT PROCESS

1. Starting by offering an outline OVERVIEW to the process, explaining that any information given by the participant is treated as confidential (to be discussed in more detail in point 9)
2. 'What brings you here'? Opening an invitation to the participant/s to share some of their personal story that led them to consider taking the course - taking care to include an EXPLORATION of mental health / medical problems / disabilities, as well as any previous experience with meditation / mindful movement etc.
3. DESCRIPTION of the approach – what is mindfulness; MBCT; how mindfulness will be inviting a different relationship to experience; what the class is not – no space to reflect on the 'why' of your experience – or personal stories.
4. The importance of COMMITTING TO THE HOME PRACTICE – linking with earlier discussions about mindfulness as an approach and underlining the need to align to regular practice even if it is difficult or boring etc. Highlighting common reactions to practice – possibly including discussion around the body scan and the reactions this can engender, from i.e. falling asleep to difficulties/aversive ness around body image (*if it has emerged that the person has active mental health problems that may include body trauma issues, it may be helpful for them to have a 'trial run' using the body scan tape for themselves as part of the orientation/assessment process*).
5. The CHALLENGES of taking the course – turning towards, increased awareness, being with what is difficult, learning to be more gentle with ourselves – and balancing this with the benefit of bringing mindfulness into one's life on a longer term basis. Emphasising the importance of committing to the process in openness and curiosity, not knowing where it will lead. Raise the possibility that sometimes things can be experienced more intensely, as an effect of apparently increased awareness – and perhaps exploring the patterns that emerge when things feel difficult and how we might work with these during the course. With someone with particular vulnerabilities, you might discuss this in more detail. Either way, it is valuable to explore the support systems that they could access for support (both personal and perhaps professional – including yourself as the course leader).
6. Some participants come for a mixture of personal and professional reasons. Reflect with them on the experiential nature of the course and 'who am I coming as'. Emphasise that the focus is on the personal.
7. Reflect together on ways in which the course may work in relation to the difficulties that are being presented by the group or the individual.

8. Being in a group – how will this be? Discuss group size, expectations of participation, etc. This is also an important assessment issue and it might be important for the course leader to determine whether the participant will be comfortable in a group – and what support they might need to learn in this setting (bearing in mind that active participation in group discussion is entirely optional). Or it may be necessary to discuss with a participant their tendency to monopolise group discussion. These issues need to be sensitively handled.
9. Explaining the stance on confidentiality encouraged within the group – including information on any invited visitors, teachers, or assistant sitting in on the course, their commitment to confidentiality, and their role. Video taking, if this is planned, and the practice of maintaining confidentiality during supervision discussions also needs to be explained and consent needs to be given. It is advisable to collect the name and address of the participant's General Practitioner and consultant or key worker (if appropriate). There then needs to be a discussion about how this information might be used – and that in the event of a teacher having a significant concern for the safety/well being of the participant, the teacher will contact the participant's General Practitioner, or other professional as appropriate. Wherever possible this would be done in collaboration with the participant.
10. Research – discuss any issues around this.
11. Exploration of “Is this the right time for you to be taking this course?” taking care to revisit the theme of commitment and timing, if it isn't already conclusive. Watch out for potentially destabilising life situations (relationship breakdown, change in medication, dip in depression, changing house or job, recent illness diagnosis, patterns of avoiding difficulties or avoiding difficult information) which may lead to strong motivation to take the course, but make the new learning and change of attitude too stressful and potentially damaging.
12. Practical arrangements – class start and finish times, dates, venue
(include the All-day in this). (*Check out special needs, mobility etc?*)

Another way we can look at assessment and orientation is through the roles we take.....

ASSESSMENT AND ORIENTATION – ROLES

- Assessor (is this the right time to take the course?) (does this participant understand enough about the process, will they be OK in a group, and cope with possible increase in intensity of emotions, negative thoughts, etc?)
- Promoter (potential outcomes) (not too much – this tends to be an overdeveloped role in mindfulness teachers!)
- Informer (venue, group size, what to expect, All Day, etc)
- Cautioner (worse before better) (can be stressful to take course)
- Connector (vital to form a connection with the participant, in order to enable a sense of trust to form and so that it will be possible support her/him to have the courage to stay with the process of the course and the home practice especially at early stages in the course)
- Orientor (emphasising the importance of practice, how will you manage to do this?)
- Support (to just do it) (not judge until the end) (ask a friend to support you to hang on in there) (therapist / counsellor)
- Special circumstances (people sitting in; video permissions; etc)

However, this list suggests that it might be you covering all this ground in one session – it is not like that. The teacher's role is to listen carefully – to inquire gently – to feel our way with people and what they want and need, balancing the process so that you cover all the essential ground and allow whatever else needs to emerge to do so.

Allow plenty of time and be prepared for it to be intense at times. Look after yourself in the process. Seeing 10 at a time will not work; take breaks between interviews.

Participant attrition, with its attendant distress and feelings of failure, can be significantly reduced by undertaking careful assessments and helping people to be well oriented to courses.

Considerations in assessing the safety & suitability of mindfulness- based courses for participants with substantial problems

This is mainly about teaching mindfulness-based programmes (MBPs) such as MBSR and MBCT to participants with substantial physical or mental health problems. It is also important to consider the suggestions below when teaching general groups of participants who are dealing with stress, etc., and when carrying out assessment of participants for any MBP.

GENERAL PUBLIC GROUPS

One consideration is whether you are teaching a general group of participants, or those with a specific diagnosis or problem (see also *Teacher's experience* below); in the latter case you need both training and a setting that will support such a group.

If the group is general (such as an evening class in a leisure centre) you may still get participants with substantial problems (see *Early trauma, past abuse, and dissociative disorders* below). This is one of the reasons we assess participants' readiness and suitability to take a course, as not everyone will benefit from a mindfulness course at any time, and for some people it may be contra-indicated.

The following is useful information to collect about would-be participants in general groups:

- History of mental illness, especially in the last few years – e.g. anxiety and depression – and any medication taken then
- Medication being taken now
- Physical disability (consider accessibility of venue)
- Recent difficult life events such as bereavement, divorce, job loss, any major change
- GP's name and contact details, or those of someone else the participant has agreed you can contact (this could be their therapist or counsellor) in case of a safety issue with the participant; you have an ethical obligation to break confidentiality if you think the participant is likely to harm themselves or others.
- Why the participant wants to take a mindfulness course at present.

Suggested exclusion criteria for general groups (subject to clinical judgement and experience of teacher, and support available to and motivation of participant):

- Active or recent physical addiction to alcohol or drugs
- Suicidality
- Psychosis
- Post-Traumatic Stress Disorder
- Acute depression
- Severe social anxiety which would make attending a class very stressful
- Physical illness which would prohibit attending a class

NB: these are not absolute exclusion criteria – it depends on the context for your teaching practice, the support you have around you, the professional experience you have, and the views of the participant themselves and how supported they are.

Participants who have had a recent severe loss such as bereavement or divorce are often in too raw a state of distress to find a course helpful. It can be advisable to wait till they have worked through the acute stage of the grieving process and are more settled with their loss (see also *Life crises* below).

If participants don't understand the language of instruction they will need interpretation. Those with hearing impairment may require an installed loop system if they have an appropriate hearing aid, or sign language interpretation if they can use this.

Listen carefully to your own concerns about participants with substantial difficulties, as well as assessing their motivation and understanding, and make your own judgement on whether they have enough support, and you have enough knowledge, time, and confidence to work with them.

GROUPS OF PARTICIPANTS WITH SPECIFIC DIAGNOSES

General considerations

Teacher's experience

Ensure you have training in and experience of the particular problems/illnesses that participants come with, and an understanding of how these may be affected by practising mindfulness meditation, and working in a group. If not, work alongside someone else with these areas of experience. Experts elsewhere can also be helpful, either through their written work, or through personal contact. You may also need to consider the setting where you work and how it fits your participant group.

Example 1: Only work with participants with a history of mental illness such as depression or mood disorders if you have training and experience with this client group.

Example 2: If working with people in chronic pain or with physical illness, you need to check access and available space, and have considered what kind of mindful movement would be suitable, and whether you have experience or back-up available in first aid should that be necessary.

Example 2: Only work with participants with a history of psychosis if you have full understanding of this illness, and how it may be affected by mindfulness practice. If you do, see the chapter about mindfulness training in Paul Chadwick's book 'Person-Based Cognitive Therapy for Distressing Psychosis'.

If you are trained and very used to working with a particular client group, where there is no research on mindfulness training with them, and if you have trained in teaching mindfulness and feel it could be helpful to try mindfulness with these clients, you need to:

- (a) consider from your knowledge of your clients and your experience of mindfulness, the different ways that mindfulness training is likely to affect them and their illness
- (b) formulate how mindfulness training could best be used with this client group, including length and kind of meditation practices; how meditation practice is likely to interact with their problems; didactic material that would enhance and support their use of mindfulness
- (c) do some cautious pilot training, evaluate this carefully, and use your evaluation to improve or cease the training.
- (d) choose a supervisor to work with you who is well equipped to support your process

Examples: This is being done in the UK with patients with acquired brain injury; cardiac failure; obsessive compulsive disorder, etc.

Participants' attitudes

The participant's attitude, understanding of their own process, and willingness to work with their experiences and with the teacher, are important factors in assessment of their readiness to take a mindfulness course. Participants who are open-minded about what may happen, who are willing to discuss openly with the teacher if they have problems, and who will accept support (and/or leave the course) if necessary, may be able to take a course with a higher level of problems or illness than participants without these attributes. Participants who think mindfulness will magically solve all their difficulties are much less likely to do well.

With participants who are professionals interested in using or teaching mindfulness as part of their work, it's important to point out to them beforehand that the course is not a training, and is experiential, and that it's essential they fully experience it for themselves (including doing the home practice) and be willing to let go of their professional personas while on the course. It's also helpful to discuss beforehand how professionals will introduce themselves in the group. Otherwise, the sense of 'being observed' can inhibit other participants from sharing their experiences in the group.

It is always important to encourage participants to find ways of working with the practices that are both safe and helpful for them. This makes the participant's experience central, and empowers them to make the training their own.

Example: If a participant suffers from panic or severe anxiety, they may find it very difficult to tolerate lying or sitting still, especially at the beginning of the course. In this case it may be helpful to have them start with a simple walking meditation, keeping their attention as much as possible in sensations in their body. For participants who find the bodyscan frightening, it can help to keep the eyes open, sit up, or mindfully shift positions, until exposure to the practice makes it more comfortable.

Research

It's a part of a teacher's ethical responsibility to be aware of research into mindfulness-based interventions (MBIs) and the useful information this provides.

Example 1: Two research studies of MBCT for the prevention of depressive relapse have shown that participants with only 2 previous episodes of major depression (who had their first episode when adult and following a specific life event, and had normal childhoods) were less likely to benefit from MBCT, whereas participants with 3 or more previous episodes (who had started being depressed when younger, and had a history of childhood difficulties) were more likely to benefit from MBCT. (Ma & Teasdale, 2004; Teasdale, 2006). There are clinical implications of these results – e.g. 1. people who are experiencing their first or second depression at a young age and who have had difficult childhood experiences may benefit from MBCT straight away rather than waiting until they have had a number of episodes;

e.g. 2. people whose depression is largely triggered by their own ways of processing experience are more likely to benefit than those whose depression is linked to a recent life event.

Example 2: One research study of MBSR for patients with different levels of current depression and anxiety found that patients with all levels of anxiety (from mild to severe) could tolerate and benefit from MBSR; however, while patients with mild to moderate levels of depression could learn to meditate and benefit from it, those with severe levels of depression were unable to do so (see Gionmi in ed. Kwee, 2006).

Participants with severe problems or vulnerabilities

Participants with more severe problems, e.g. treatment-resistant depression (see Kenny & Williams, 2007) and some cases of PTSD, may be able to take a mindfulness course. It's essential that they understand what it entails, and are given (and give themselves) full permission to drop out of the course if they find it unhelpful (though be aware that this may reinforce negative self-image). It is most important that they are fully supported, either by the teacher, or by their own therapist; the former needs to understand the nature of their difficulties, and the latter needs to understand the experiential, intense and potentially stressful or painful nature of learning awareness and acceptance in a MBI.

If therapists, etc. are referring clients to you for mindfulness training, give them at least a taster so they know something about it – if possible, get them to do some training themselves – many therapists (and their own clients) will gain considerable benefit from this.

Clients with problems that are too severe for them to learn mindfulness themselves can be greatly helped by their carers (professional or family) being given mindfulness training (see Singh et al., 2004). This can also greatly benefit the carers.

Specific considerations

Chronic v. acute illnesses

MBSR and MBCT are generally used with participants with chronic problems or illnesses, either physical or mental, who are therefore used to dealing with them (though they can learn better ways to do this). Periods of acute illness (or sometimes an acute attack of an existing illness) where patients are dealing with high levels of stress, and can be getting used to dealing with a new and different way of being, are generally not good times to learn mindfulness practice

Life crises

Similar to acute illnesses above, when participants have had a recent bereavement, divorce, cancer diagnosis, etc., is usually not a good time to take a mindfulness course. Pre-existing mindfulness practice is very helpful in dealing with strong, raw feelings such as grief, shock and anger, but these are usually too overwhelming for participants to learn how to meditate while dealing with them.

Suicidal tendencies

This is a dangerous vulnerability for new meditators, so people who are feeling suicidal should be asked to wait and take a course when things are better for them, and then be carefully monitored in case of reoccurrence. See the results of the trial on MBCT for people with suicidal depression (Williams et al., 2013) and the final chapter in the book MBCT for people at risk of suicide which outlines the clinical implications of the research (Williams, Fennell et al., 2015).

Substance misuse

If participants are currently physically dependent on drugs or alcohol, they are very unlikely to be able to undertake a normal mindfulness course, as their awareness and ability to stay in the present are negatively affected because they would either be under the influence of a substance (which precludes meditative awareness) or in a process of withdrawal; their lives may also be too chaotic to make a regular commitment. Participants who are psychologically but not physically dependent on substances, and who meet other criteria for taking a course (e.g. well motivated to change, some insight) may be able to engage with mindfulness training, and to work with their reactive use of substances, as would participants dealing with ruminative thinking, anxiety or stress.

Mindfulness-based Relapse Prevention (MBRP) has been developed specifically for people who are working with their own tendencies to misuse substances. In a generic group, when assessing someone where there are concerns about their level of substance use, it would be helpful to have supervision from someone experienced in using mindfulness within the substance misuse field. If the participant is suitable to take an 8-week course, their addiction can be worked with in the same way as any other difficulty. CMRP is now offering trainings in MBRP – check our website.

Psychosis, schizophrenia, etc.,

Participants who are currently psychotic, or out of contact with what is normally considered reality, are unlikely to be helped by mindfulness meditation, and may be harmed. There is a small amount of evidence that meditation has triggered psychotic episodes in some individuals, and although this may not be true of mindfulness meditation, with its emphasis on grounding in physical sensations and other bodily senses, it would make sense to aim for safety here. See also *Teacher's experience* and *Participants with severe problems or vulnerabilities* above.

Early trauma, past abuse, and dissociative disorders

These are all indications to move into mindfulness training with great care, in-depth understanding of the issues involved, and willingness to support and go at the client's own pace. See the results of the trial mentioned above (Williams et al., 2013) which does give a strong indication that MBCT adapted for people with heightened vulnerability does support people who have experienced early childhood trauma to stay well in the longer term.

If a participant reports 'leaving the body' when meditating, although this can be a spiritual experience, it can indicate that there are embodied memories that are too dangerous or painful to face, and the participant is maintaining an important defence strategy by dissociating. If you are working with such a participant, go very cautiously indeed, encourage them to come back into their bodies by opening their eyes and focussing on what they can see (perhaps describing it to themselves or you), shifting position, or getting up and moving about, having a drink of water, etc.

Recognise that many people have suffered from trauma, so there's quite likely to be one or more in any group, and some may work positively with this using mindfulness, with or without the teacher's knowledge of their past. Participants may be understandably reluctant to talk about difficulties such as flashbacks when meditating, so it's important they feel they can talk to the mindfulness teacher outside the class, and/or their therapist, about such experiences. This is one reason why it is essential to give participants the option of sitting instead of lying down for the bodyscan, and to move positions if they need to.

CMRP offers a masterclass on trauma informed ways of working in the context of MBPs. You can also look up recent work on mindfulness and trauma (e.g. see Follette reference below).

Learning disabilities, and severe multiple disabilities

There has been little use of mindfulness training reported with participants who suffer from learning disabilities, apart from some initial work by Singh (see his 2003 case study on using a simple practice of bringing attention to the soles of the feet for a man with learning disabilities who suffered from outbreaks of anger). Practices would need to be simplified and carefully tailored.

Singh has also researched mindfulness training for carers of men with severe and multiple disabilities, and found that this significantly increased their level of happiness (see Singh et al. 2004).

Asthma and other breathing problems

Participants with breathing problems may not feel safe using their breath as an 'anchor' into the present moment. They can be guided individually to find another part of their body that represents a 'safe place' for them to place their attention – (sometimes taking attention lower down in the body such as the buttocks on the seat or feet on the floor can reduce fear and increase calmness). With one or more such participants in a group, it is helpful to remember to include this in general instructions, e.g. 'return to the breath or to the connection of your body with what is supporting it'.

Difficulties being in a group

This could be a difficulty for the participant (e.g. social anxiety) that would make working in a group too stressful or even impossible (in which case consider 1-to-1 mindfulness training). If you feel the participant would be disruptive in a group situation, seriously consider excluding them for the sake of the rest of the group.

Acknowledgements to the Center For Mindfulness for use of a version of their 'Screening Criteria for Exclusion from the Stress Reduction Program'.

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Pilot Study - Participant information Sheet and Consent Form.

**Pilot study for the feasibility and acceptability of a
Theatre-Based Relational Health Intervention**

(UCT FHS HREC Ref no. 068/2019)

PARTICIPANT INFORMATION SHEET

Relational health is being considered a key indicator of mental health. The ability to be aware of and regulate one's thoughts and emotions for well-being supports healthy relationships that are empathic, compassionate and authentic. Behavioural interventions are able enhance relational health by re-education of behavioural choices and provision of tools which train self-regulation internally and in response to the external environment. Similarly, theatre training entrains self-awareness (interoception) and targets awareness of the relationship between internal and external behaviour.

The aim of this research study is to investigate a 6-week Theatre-Based Relational Health (TBRH) intervention; the purpose of which is to improve relational health through the development of interoception (self-awareness) and emotion regulation (the ability to keep yourself in balance within changing environments). The TBRH is comprised of exercises that emerge from theatre training and includes present-based exercises and character development exercises which give insight into the different aspects of yourself. The intervention will address your relational health with those you are close to and environmental contexts, and how these relationships affect your physiology, emotions and thoughts. A core exercise in the TBRH is a breathing exercise which you will master through the course of the intervention, to bring you into physiological balance (homeostasis), before and after reflecting on different aspects of yourself when engaged in relations.

The TBRH intervention will be conducted over 6 weeks during which time we will meet in a group format once a week for 2 hours of contact time. The pilot study data collected will include (1) the completion of questionnaires which measure self-awareness and emotion regulation when you start and at the end of the intervention; and (2) a semi-structured scheduled interview to gain insights of your experience during the intervention and feedback about different exercises within the TBRH intervention. In addition, (3) during the intervention there will be daily homework, and only the period of time where only the period of time taken to complete my homework and not what I write will be recorded online. All data collected will be anonymized and analyses will be performed to determine whether the intervention is feasible and acceptable, and if modification to the TBRH is needed. This initial study will include 2 groups of 12 healthy adults; the groups will be run separately.

Criteria for inclusion:

- All participants need to be healthy and within the ages of 25-65 years old.

- Individuals who have not been on prescription medication currently or in the last year for a medical condition, e.g. antidepressants or ARVs or insulin
- Have either had no exposure to or have no regular practise of reflective and/or breathing related interventions
- Participants need to be fluent in English only as the intervention is conducted in English.

Benefits of participation:

- Receive free 6-week Theatre-Based Relational Health (TBRH) intervention
- Receive tools to become aware of self and how different relationships and contexts affect you
- Receive tools to emotionally regulate and return to a physiological balance (homeostasis)
- Learn about what activities keep you in physiological balance and return you physiological balance to improve relational health

This research study has been approved by the University of Cape Town's Human Research Ethics Committee (UCT HSF HREC). This study is conducted in accordance to the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013).

Participation is voluntary; no data will be collected unless you as a research participant have signed informed consent. If you want to stop participating in the research project at any time, you can and an explanation is not required. The study is for research purposes only. Your personal details will be held confidentially, and your name will be anonymized with a code once it has been collected and before data analysis is performed.

If you have any queries in regard to the TRBH study, and meet our inclusion criterion and would like to participate in this research please email: Ruth Levin-Vorster LVNRUT002@myuct.ac.za

If you have any concerns with this research study please email, the Principal Investigator Associate Professor Fleur Howells: fm.howells@uct.ac.za; else call her office: 021 404 5480

**These first two pages of information are for the participant, and must be read before proceeding to the consent. The consent, following two pages are to be stored securely, by the researcher.*

Pilot study for the feasibility and acceptability of a Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no. 068/2019)

INFORMED CONSENT

I understand that this study will measure the feasibility and acceptability of a Theatre-Based Relational Health (TBRH) intervention, designed to entrain self-awareness and emotion regulation (the ability to stay in balance) for regulated communication to improve relational health **Yes / No**

To participate in this study there are inclusion and exclusion criterion, please answer yes or no to the following questions to ensure that you are eligible to participate, please *circle* relevant response:

- (1) I am between the ages of 25 and 65 years old **Yes / No**
- (2) I am not currently, and have not taken chronic medication for a medical condition in the last year **Yes / No**
- (3) I have either no exposure to or no regular practice of breathing related interventions **Yes / No**
- (4) I am fluent in the English language **Yes / No**

I will be one of up to 12 participants in a group, and I am able to participate in a group format **Yes / No**

This research project will require my participation in an intervention delivered over 6 weeks, for two hours of contact time per week **Yes / No**

I will need to complete 10-20min of homework per day, where only the period of time taken to complete my homework and not what I write will be recorded **Yes / No**

Before and after the TBRH intervention I will complete several questionnaires and scales **Yes / No**

At the end of the 6 weeks I will interviewed about the TBRH intervention **Yes / No**

I understand that this study comprises adapted theatre exercises and awareness-based exercises to develop self-awareness and a breathing intervention to develop emotion regulation **Yes / No**

I understand that the TBRH intervention is aimed at improving self-awareness and emotion regulation for regulated communication to improve relational health **Yes / No**

I understand that the information I provide by participating in the research project will be held confidentially and will only be used for research purposes of this study **Yes / No**

I understand that the data collected from this research study will be anonymized, i.e. my name will not be attached to the data collected **Yes / No**

I understand that I will not receive any remuneration directly except for the tools within the intervention itself and that this study is only for research purposes **Yes / No**

I understand that I am receiving tools to improve self-awareness and emotion regulation at no cost. **Yes/No**

I understand that my relational health may not improve as a result of the intervention. **Yes/No**

I understand that as I become more self-aware I might experience some discomfort as I learn about negative aspects of my relational patterning. **Yes/No**

I understand that participation in this study is voluntary and I will be able to withdraw from this study at any given time and this withdrawal will bear no negative effect on my person or wellbeing **Yes / No**

I understand that the data collected will form part of a doctor of philosophy degree, however I will not receive individualized feedback **Yes / No**

In addition:

The University of Cape Town (UCT) has insurance cover for the event that research-related injury or harm results from your participation in the study. The insurer will pay all reasonable medical expenses in accordance with the South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI) in the event of an injury or side effect resulting directly from your participation in the study. You will not be required to prove fault on the part of the University.

The University **will not be liable** for any loss, injuries and/or harm that you may sustain where the loss is caused by

- The use of unauthorised medicine or substances during the study
- Any injury that results from you not following the protocol requirements or the instructions that the study doctor may give you
- Any injury that arises from inadequate action or lack of action to deal adequately with a side effect or reaction to the study medication
- An injury that results from negligence on your part

“By agreeing to participate in this study, you do not give up your right to claim compensation for injury where you can prove negligence, in separate litigation. In particular, your right to pursue such a claim in a South African court in terms of South African law must be ensured. Note, however, that you will usually be requested to accept that payment made by the University under the SA GCP guideline 4.11 is in full settlement of the claim relating to the medical expenses. “

An injury is considered study-related if, and to the extent that, it is caused by study activities. You must notify the study research immediately of any side effects and/or injuries during the trial, whether they are research-related or other related complications.

UCT reserves the right not to provide compensation if, and to the extent that, your injury came about because you chose not to follow the instructions that you were given while you were taking part in the study. Your right in law to claim compensation for injury where you prove negligence is not affected. Copies of these guidelines are available on request.

This consent form has been read and understood by:

Participant's name _____

Participant's email address: * _____

Participant's cell no. * _____

**These contact information will only be used towards completing your participation in this research study*

Participant's signature _____ Date of consent signing _____

Researcher who collected completed informed consent: **Ruth Levin-Vorster**

Researcher's signature _____ Date of confirmatory signing _____

**Multidimensional Assessment of Interoceptive Awareness
(MAIA)
Version 2
(2018)**

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<http://www.osher.ucsf.edu/maia/>

Permission and Copyright

- Please refer to the survey using its complete name – Multidimensional Assessment of Interoceptive Awareness - and provide the appropriate citation.
- Modifications may be made without our written permission. However, please clearly identify any modifications in any publications as having been made by the users. If you modify the survey, please let us know for our records.
- We recommend including entire subscales when selecting items from the MAIA to retain the psychometric features of these subscales (rather than selecting items from subscales).
- If you translate the MAIA into another language, please send us a copy for our records.
- If other investigators are interested in obtaining the survey, please refer them to the source document (PLOS-ONE 2012, and www.osher.ucsf.edu/maia/) to assure they obtain the most recent version and scoring instructions.

Note: (R): reverse-score (5 – x) items 5, 6, 7, 8, 9 and 10 on Not-Distracting, and items 11, 12 and 15 on Not-Worrying.

1. **Awareness:** Awareness of uncomfortable, comfortable, and neutral body sensations

 Q1_____ + Q2_____ + Q3_____ + Q4_____ / 4 = _____
2. **Not-Distracting:** Tendency not to ignore or distract oneself from sensations of pain or discomfort

 Q5(R)____ + Q6(R)____ + Q7(R)____ + Q8(R)____+Q9(R)____+Q10(R) / 6 = _____
3. **Not-Worrying:** Tendency not to worry or experience emotional distress with sensations of pain or discomfort

 Q11(R)_____ + Q12(R)_____ + Q13_____ + Q14_____ + Q15 (R) / 5 = _____
4. **Attention Regulation:** Ability to sustain and control attention to body sensations

 Q16_____ + Q17_____ + Q18_____ + Q19_____ + Q20_____ + Q21_____ + Q22_____ / 7 = _____
5. **Emotional Awareness:** Awareness of the connection between body sensations and emotional states

 Q23_____ + Q24_____ + Q25_____ + Q26_____ + Q27_____ / 5 = _____
6. **Self-Regulation:** Ability to regulate distress by attention to body sensations

 Q28_____ + Q29_____ + Q30_____ + Q31_____ / 4= _____
7. **Body Listening:** Active listening to the body for insight

 Q32_____ + Q33_____ + Q34_____ / 3= _____
8. **Trusting:** Experience of one's body as safe and trustworthy

 Q35_____ + Q36_____ + Q37_____ / 3= _____

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life.

	Circle one number on each line					
	Never			Always		
1. When I am tense I notice where the tension is located in my body.	0	1	2	3	4	5
2. I notice when I am uncomfortable in my body.	0	1	2	3	4	5
3. I notice where in my body I am comfortable.	0	1	2	3	4	5
4. I notice changes in my breathing, such as whether it slows down or speeds up.	0	1	2	3	4	5
5. I ignore physical tension or discomfort until they become more severe.	0	1	2	3	4	5
6. I distract myself from sensations of discomfort.	0	1	2	3	4	5
7. When I feel pain or discomfort, I try to power through it.	0	1	2	3	4	5
8. I try to ignore pain	0	1	2	3	4	5
9. I push feelings of discomfort away by focusing on something	0	1	2	3	4	5
10. When I feel unpleasant body sensations, I occupy myself with something else so I don't have to feel them.	0	1	2	3	4	5
11. When I feel physical pain, I become upset.	0	1	2	3	4	5
12. I start to worry that something is wrong if I feel any discomfort.	0	1	2	3	4	5
13. I can notice an unpleasant body sensation without worrying about it.	0	1	2	3	4	5
14. I can stay calm and not worry when I have feelings of discomfort or pain.	0	1	2	3	4	5
15. When I am in discomfort or pain I can't get it out of my mind	0	1	2	3	4	5
16. I can pay attention to my breath without being distracted by things happening around me.	0	1	2	3	4	5
17. I can maintain awareness of my inner bodily sensations even when there is a lot going on around me.	0	1	2	3	4	5
18. When I am in conversation with someone, I can pay attention to my posture.	0	1	2	3	4	5

How often does each statement apply to you generally in daily life? Circle one number on each line

	Never					Always
19. I can return awareness to my body if I am distracted.	0	1	2	3	4	5
20. I can refocus my attention from thinking to sensing my body.	0	1	2	3	4	5
21. I can maintain awareness of my whole body even when a part of me is in pain or discomfort.	0	1	2	3	4	5
22. I am able to consciously focus on my body as a whole.	0	1	2	3	4	5
23. I notice how my body changes when I am angry.	0	1	2	3	4	5
24. When something is wrong in my life I can feel it in my body.	0	1	2	3	4	5
25. I notice that my body feels different after a peaceful experience.	0	1	2	3	4	5
26. I notice that my breathing becomes free and easy when I feel comfortable.	0	1	2	3	4	5
27. I notice how my body changes when I feel happy / joyful.	0	1	2	3	4	5
28. When I feel overwhelmed I can find a calm place inside.	0	1	2	3	4	5
29. When I bring awareness to my body I feel a sense of calm.	0	1	2	3	4	5
30. I can use my breath to reduce tension.	0	1	2	3	4	5
31. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.	0	1	2	3	4	5
32. I listen for information from my body about my emotional state.	0	1	2	3	4	5
33. When I am upset, I take time to explore how my body feels.	0	1	2	3	4	5
34. I listen to my body to inform me about what to do.	0	1	2	3	4	5
35. I am at home in my body.	0	1	2	3	4	5
36. I feel my body is a safe place.	0	1	2	3	4	5
37. I trust my body sensations.	0	1	2	3	4	5

Appendix F

Five Facet Mindfulness Questionnaire

Description:

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

- _____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- _____ 2. I'm good at finding words to describe my feelings.
- _____ 3. I criticize myself for having irrational or inappropriate emotions.
- _____ 4. I perceive my feelings and emotions without having to react to them.
- _____ 5. When I do things, my mind wanders off and I'm easily distracted.
- _____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- _____ 7. I can easily put my beliefs, opinions, and expectations into words.
- _____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- _____ 9. I watch my feelings without getting lost in them.
- _____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- _____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- _____ 12. It's hard for me to find the words to describe what I'm thinking.
- _____ 13. I am easily distracted.
- _____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

- _____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- _____ 16. I have trouble thinking of the right words to express how I feel about things
- _____ 17. I make judgments about whether my thoughts are good or bad.
- _____ 18. I find it difficult to stay focused on what's happening in the present.
- _____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- _____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- _____ 21. In difficult situations, I can pause without immediately reacting.
- _____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
- _____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
- _____ 24. When I have distressing thoughts or images, I feel calm soon after.
- _____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
- _____ 26. I notice the smells and aromas of things.
- _____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
- _____ 28. I rush through activities without being really attentive to them.
- _____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- _____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- _____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- _____ 32. My natural tendency is to put my experiences into words.
- _____ 33. When I have distressing thoughts or images, I just notice them and let them go.
- _____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
- _____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
- _____ 36. I pay attention to how my emotions affect my thoughts and behavior.
- _____ 37. I can usually describe how I feel at the moment in considerable detail.
- _____ 38. I find myself doing things without paying attention.
- _____ 39. I disapprove of myself when I have irrational ideas.

Scoring Information:Observe items:

1, 6, 11, 15, 20, 26, 31, 36

Describe items:

2, 7, 12R, 16R, 22R, 27, 32, 37

Act with Awareness items:

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R

Nonjudge items:

3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R

Nonreact items:

4, 9, 19, 21, 24, 29, 33

Reference:

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.

Appendix G

The Self-Compassion Scale (SCS)

To Whom it May Concern:

Please feel free to use the Self-Compassion Scale in your research. Masters and dissertation students also have my permission to use and publish the Self-Compassion Scale in their theses. The appropriate reference is listed below.

Best,

Kristin Neff, Ph. D.
Associate Professor
Educational Psychology Dept.
University of Texas at Austin

e-mail: kneff@austin.utexas.edu

Reference:

Neff, K. D. (2003). Development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223-250.

Coding Key:

Self-Kindness Items: 5, 12, 19, 23, 26

Self-Judgment Items: 1, 8, 11, 16, 21

Common Humanity Items: 3, 7, 10, 15

Isolation Items: 4, 13, 18, 25

Mindfulness Items: 9, 14, 17, 22

Over-identified Items: 2, 6, 20, 24

Subscale scores are computed by calculating the mean of subscale item responses. To compute a total self-compassion score, reverse score the negative subscale items before calculating subscale means - self-judgment, isolation, and over-identification (i.e., 1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1) - then compute a grand mean of all six subscale means. Researchers can choose to analyze their data either by using individual sub-scale scores or by using a total score.

(This method of calculating the total score is slightly different than that used in the article referenced above, in which each subscale was added together. However, I find it is easier to interpret the total score if a mean is used.)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never					Almost always
1	2	3	4		5
_____					1. I'm disapproving and judgmental about my own flaws and inadequacies.
_____					2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
_____					3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
_____					4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
_____					5. I try to be loving towards myself when I'm feeling emotional pain.
_____					6. When I fail at something important to me I become consumed by feelings of inadequacy.
_____					7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
_____					8. When times are really difficult, I tend to be tough on myself.
_____					9. When something upsets me I try to keep my emotions in balance.
_____					10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
_____					11. I'm intolerant and impatient towards those aspects of my personality I don't like.
_____					12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
_____					13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
_____					14. When something painful happens I try to take a balanced view of the situation.
_____					15. I try to see my failings as part of the human condition.
_____					16. When I see aspects of myself that I don't like, I get down on myself.
_____					17. When I fail at something important to me I try to keep things in perspective.

- _____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- _____ 19. I'm kind to myself when I'm experiencing suffering.
- _____ 20. When something upsets me I get carried away with my feelings.
- _____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- _____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- _____ 23. I'm tolerant of my own flaws and inadequacies.
- _____ 24. When something painful happens I tend to blow the incident out of proportion.
- _____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- _____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

State-Trait Anxiety Inventory for Adults

Self-Evaluation Questionnaire

STAI Form Y-1 and Form Y-2

Developed by Charles D. Spielberger

in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

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SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name _____ Date _____ S _____

Age _____ Gender (Circle) M F T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL
SOMEWHAT
MODERATELY SO
VERY MUCH SO

- | | | | | |
|--|---|---|---|---|
| 1. I feel calm..... | 1 | 2 | 3 | 4 |
| 2. I feel secure | 1 | 2 | 3 | 4 |
| 3. I am tense | 1 | 2 | 3 | 4 |
| 4. I feel strained | 1 | 2 | 3 | 4 |
| 5. I feel at ease | 1 | 2 | 3 | 4 |
| 6. I feel upset | 1 | 2 | 3 | 4 |
| 7. I am presently worrying over possible misfortunes | 1 | 2 | 3 | 4 |
| 8. I feel satisfied | 1 | 2 | 3 | 4 |
| 9. I feel frightened | 1 | 2 | 3 | 4 |
| 10. I feel comfortable | 1 | 2 | 3 | 4 |
| 11. I feel self-confident..... | 1 | 2 | 3 | 4 |
| 12. I feel nervous | 1 | 2 | 3 | 4 |
| 13. I am jittery | 1 | 2 | 3 | 4 |
| 14. I feel indecisive..... | 1 | 2 | 3 | 4 |
| 15. I am relaxed | 1 | 2 | 3 | 4 |
| 16. I feel content | 1 | 2 | 3 | 4 |
| 17. I am worried | 1 | 2 | 3 | 4 |
| 18. I feel confused..... | 1 | 2 | 3 | 4 |
| 19. I feel steady..... | 1 | 2 | 3 | 4 |
| 20. I feel pleasant..... | 1 | 2 | 3 | 4 |

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

ALMOST NEVER
SOMETIMES
OFTEN
ALMOST ALWAYS

- | | | | | |
|--|---|---|---|---|
| 21. I feel pleasant..... | 1 | 2 | 3 | 4 |
| 22. I feel nervous and restless | 1 | 2 | 3 | 4 |
| 23. I feel satisfied with myself..... | 1 | 2 | 3 | 4 |
| 24. I wish I could be as happy as others seem to be | 1 | 2 | 3 | 4 |
| 25. I feel like a failure | 1 | 2 | 3 | 4 |
| 26. I feel rested | 1 | 2 | 3 | 4 |
| 27. I am "calm, cool, and collected" | 1 | 2 | 3 | 4 |
| 28. I feel that difficulties are piling up so that I cannot overcome them..... | 1 | 2 | 3 | 4 |
| 29. I worry too much over something that really doesn't matter..... | 1 | 2 | 3 | 4 |
| 30. I am happy | 1 | 2 | 3 | 4 |
| 31. I have disturbing thoughts | 1 | 2 | 3 | 4 |
| 32. I lack self-confidence..... | 1 | 2 | 3 | 4 |
| 33. I feel secure | 1 | 2 | 3 | 4 |
| 34. I make decisions easily | 1 | 2 | 3 | 4 |
| 35. I feel inadequate..... | 1 | 2 | 3 | 4 |
| 36. I am content | 1 | 2 | 3 | 4 |
| 37. Some unimportant thought runs through my mind and bothers me | 1 | 2 | 3 | 4 |
| 38. I take disappointments so keenly that I can't put them out of my mind..... | 1 | 2 | 3 | 4 |
| 39. I am a steady person..... | 1 | 2 | 3 | 4 |
| 40. I get in a state of tension or turmoil as I think over my recent concerns
and interests | 1 | 2 | 3 | 4 |

State-Trait Anxiety Inventory for Adults Scoring Key (Form Y-1, Y-2)

Developed by Charles D. Spielberger in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, fold this sheet in half and line up with the appropriate test side, either Form Y-1 or Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question # 1, if the respondent marked 3, then the **weight** would be 2. Refer to the manual for appropriate normative data.

Form Y-1	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	4	3	2	1
2.	4	3	2	1
3.	1	2	3	4
4.	1	2	3	4
5.	4	3	2	1
6.	1	2	3	4
7.	1	2	3	4
8.	4	3	2	1
9.	1	2	3	4
10.	4	3	2	1
11.	4	3	2	1
12.	1	2	3	4
13.	1	2	3	4
14.	1	2	3	4
15.	4	3	2	1
16.	4	3	2	1
17.	1	2	3	4
18.	1	2	3	4
19.	4	3	2	1
20.	4	3	2	1

Form Y-2	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21.	4	3	2	1
22.	1	2	3	4
23.	4	3	2	1
24.	1	2	3	4
25.	1	2	3	4
26.	4	3	2	1
27.	4	3	2	1
28.	1	2	3	4
29.	1	2	3	4
30.	4	3	2	1
31.	1	2	3	4
32.	1	2	3	4
33.	4	3	2	1
34.	4	3	2	1
35.	1	2	3	4
36.	4	3	2	1
37.	1	2	3	4
38.	1	2	3	4
39.	4	3	2	1
40.	1	2	3	4

Appendix I

Theatre-Based Relational Health Intervention Programme – Developed by Ruth Levin-Vorster

Administered over 6 weeks with 2 hours contact time per week. Daily homework (10-20min)

Week 1 (2hours contact time)

- A talk about relationships – ‘why they are so difficult and what one can do about it’

Information includes:

- Empathy and its challenges
- Compassion
- The notion of integration
- Brain-mind-relationships
- The brain in stress – what happens when you are triggered
- The complexity of a feeling – looking at the neurophysiology
- Neuroplasticity – socio-affective and cognitive mental training programmes

The talk is based on the work of Daniel Siegel¹⁻⁴, Brene Brown⁵⁻⁸, Kristin Neff⁹, Tania Singer, Klimecki and colleagues¹⁰⁻¹³, Bud Craig¹⁴⁻¹⁷, Antonia Damasio¹⁸⁻²⁰, Vittoria Gallese²¹⁻²⁴, Rick Hanson²⁵ and ongoing research.

- Overview of the course
- **The Golden Nugget Listening/Breathing exercise (GNLBE).** Developed by Ruth Levin-Vorster

Located in the mindfulness breathing tradition this exercise activates parasympathetic regulation and promotes compassionate listening to the self and other.

Participants are guided through this breathing exercise in stages. They are guided to place their feet hip width apart directly under their shoulders. They are instructed to take three deep and slow breaths and gently bring themselves into the room and into their body. Participants are orientated to the ‘core’ area of the pelvis, the ‘belt’ area, known as the ‘tan tien’ in traditional Chinese medicine. This is found by placing four fingers horizontally below the naval. Where the 4th and baby finger lie is where the entire hand should be placed to gently activate the area with touch. They are instructed to gently activate and fill this area of the body with breath. They are asked to notice whether the sensations within this area are tight, pulling, resisting, aching, soft or expansive etc. The participant is guided to gently activate this area with breath. After a few minutes participants are asked to allow a colour to emerge. If a colour emerges, they are asked to fill this area with the colour and breath. If no colour emerges they are instructed to continue just with the breath alone. For many the addition of the visualization of colour enhances an embodied activation of this ‘core’ area in line with psychophysiological changes that are activated with visualization of different kinds (Menzies et al, 2013)

The exercise can be done standing or sitting. It is preferred to learn the exercise standing as whole body-mind engagement is more accessible in this position, i.e. one is not tempted to rest against the back of the chair.

Daily homework:

- to practise the GNLBE for 5min.

Week 2 (2hours contact time)

- Feedback from Week 1
- The GNLBE
- **An exercise to address aspects of self, using character analysis 1.** (Developed by Ruth Levin-Vorster)

Materials: sheets of paper, fabric of different kinds, scissors, glue, colour kokis and crayons.

Preamble: This exercise begins to address different aspects of one's character, which are often contradictory. It explores the participant's character when in balance and when out of balance. In addition, it reveals activities that are regularly needed for the individual's character to maintain a mental, emotional, physical and spiritual equilibrium, together with information about what shifts them out of balance.

This is a creative process that utilizes visual and tactile stimuli to prompt an emotional distance between the core self and different aspects of one's character. The individual transfers different elements of their internal self onto external characters that reflect different parts of the self, however not the whole self. The process stimulates a meta-awareness of the self and how it changes and adapts to contextual cues.

The exercise is introduced through the notion of various aspects of the self that emerge within different relationships. For example, with a parent, friend, work colleague, a boss, spouse or romantic partner. An awareness of the normality of this human trait is primed through the introduction.

The exercise's instruction: Write down one aspect of yourself that you like. Write down one aspect of yourself that you don't like. Write down one aspect of yourself that you don't understand. Create a character for each of these parts. Design their clothes from the selection of fabric. Cut and paste them on your paper – a sheet for each character. Name them. Write three characteristics for each one. Write down 1-3 things that keep each character in balance and three things that overwhelm them. Now create three additional characters that are the opposite of the original three characters. Repeat the same process as above for the remaining 2 characters.

- **Reflection questions to be journaled in class for 10 minutes and continued at home.**

What character surprised you? Why?

Did you gain any new insight into yourself? Write down one or more.

Describe what pushes one aspect of you out of balance.

Describe one ritual that keeps you in balance.

- **Discussion in pairs in class**

What was the exercise like for you?

Share one insight with your partner.

Daily homework:

- participants are asked to hold an awareness of their findings as they go about their lives through the week. Participants are asked to observe when different aspects of themselves emerge. Perhaps additional ‘characters’ present themselves. In addition, participants are asked to implement one activity that they have identified as keeping them in balance.
- to practise the GNLBE for 5min.
- to complete the journaling about the different aspects of self.

Week 3 (2hours contact time)

- Feedback from Week 2
- **The Biography Worksheet (20 min)** Developed by Ruth Levin-Vorster

This is a questionnaire to prompt awareness of the early caregiver, environmental and life events that have shaped one’s perspective lens, communication and affective style and emotional triggers.

Biography Worksheet: developed by Ruth Levin-Vorster

This document is confidential.

Any sharing during the course is at your own discretion.

What does your name mean? Who named you?

What country did you grow up in?

What was the political and social climate?

What country did your parents grow up in?

What was your home language growing up?

Was it the same language you spoke at school?

Is it the same language you speak at work?

What religious environment did you grow up in?

Did it resonate with you? Have you carried it forward into your current life?

What cultural environment did you grow up in?

Did it resonate with you? Have you carried it forward into your current life?

Where the above two entwined or separate?

Did your family mix with different cultures and religions when you grew up?

Do you mix with different cultures and religions?

How do you think your family environment growing up has influenced your perspective lens?

Are you aware of any biases from this perspective lens?

The next three questions answer very simply.

Who did you live with growing up?

Was it a happy home?

Did you feel seen and acknowledged?

Did you feel safe?

What dominated your childhood for you?

What food?

Music?

Childhood Activities?

Friends?

Write down any sensations, smells, sounds, tastes, images, in your mind that jumps up on childhood?

Return to now:

Favourite food?

Worst food?

Favourite smell?

Hobbies?

What do you do for down time?

What activity is essential to your overall health?

3 key people in your life.

In your personal life do you feel seen and acknowledged?

In your professional life do you feel seen and acknowledged?

Don't write these down. First thing that comes into your mind.

What's your secret dream?

What's your secret fear?

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- **Relationship triggers and patterning, using character analysis 2:** Developed by Ruth Levin-Vorster

The exercise explores the felt dynamic implicit within primary care-giver relationships that might have modelled current relationship patterns and relational reactivity cues. It is an embodied mindfulness process that prompts the body's implicit memory to surface into conscious awareness with regard to the physiological and emotional signals that early caregiver relationships set in motion (or trigger). The exercise develops to explore the physiological, emotional and mental components of these triggers.

The exercise's instruction: Lie on the floor or sit on a chair or on the floor against the wall. Allow yourself to be comfortable. Take three deep slow breaths in and out. Feel your back melting into the floor or into the chair. Bring to mind your earliest caregiver. Hold this person in your imagination. Notice the dynamic between you. What does it feel like? Notice the sensations in your body. Where are they located? What is the texture? Colour? Sound? What emotion are you feeling? What kind of thoughts are going through your mind?

Take a deep breath in and release. Now take 10 deep and slow breaths and bring yourself back into your body and into the room. This exercise is repeated a further two times for additional significant people in one's early life. Participants are then guided out of the exercise and given a worksheet to fill in.

Worksheet questions for week 3, in session, after the exercise - Relationship triggers and patterning, using character analysis 2

Describe each relationship dynamic in terms of sensation, emotion and thoughts.

Are there any patterns between the different relationship dynamics?

© Ruth Levin-Vorster

Are they present in current relationships? If yes how is it manifesting. Describe the relationship.

How does each dynamic make you feel about yourself?

How would you like the challenging dynamics to shift?

Write about a positive relationship dynamic and how this makes you feel.

© Ruth Levin-Vorster

Daily homework:

- participants are asked to observe the physiological, emotional and mental patterns connected to their relational experiences through the week. They are asked to journal daily for 10-20min on their observations.
- to practise the GNLBE for 5min.

Week 4 (2hours contact time)

Feedback from Week 3

- GNLBE
- Practising the GNLBE within an imagined stressful relationship environment. Developed by Ruth Levin-Vorster

The golden nugget breathing exercise is now applied within an imagined but real stressful relational context to experience the impact of the breathing exercise on emotional reactivity and the quality of listening to the other party involved in the conflict.

The exercise: Find a space in the room. Place your feet hip width apart directly under your shoulders. Take three deep and slow breaths and gently bring yourself into the room and into your body. I want you to think about a stressful relationship, professional or personal, and the first one that enters your mind. Where do you feel the in your body? Intensify this feeling. What texture is it? What colour? What shape? Again, intensify these feelings.

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Participants are now instructed to move towards a wall and to face it with enough distance between them and the wall to allow for the wall to represent the person they are thinking about. They are asked to begin a conversation with the person, and this is executed silently in their mind. After 2-3min, participants are asked to release this and to return to the centre of the room.

Participants are then guided through the golden/nugget breathing exercise. Subsequently they are asked to return to the same place facing the wall and to continue their conversation while maintaining the awareness of their 'core' breathing and colour. When this is complete, the differences in the two conversations are unpacked in the group.

- At the end of the exercise, paper is provided, and participants are asked to write down one core trigger.
- Feedback from exercise in group discussion.

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Daily homework:

- participants are asked to continue practising the GNLBE daily and to implement it in a real-world context. They are required to journal about the experience. They are asked to continue observations in their journal.
- continue to implement one activity for mental well-being.

Week 5 (2hours contact time)

- Feedback from Week 4
- **Role-Play exercise:** Various challenging relational scenarios are role-played by the group based on triggers provided by the group at the end of week 4. Participants are instructed to consciously observe their triggers as they arise and intercept them with the golden nugget breathing exercise. Each role-play is unpacked after the enactment.

Daily homework:

- participants are asked to continue practising the GNLBE daily and to implement it in a more challenging real-world context. They are required to journal about the experience.

Week 6 (2hours contact time)

- Feedback from Week 5
- **Recap and forward intentions:** Recapping all the exercises learnt and ironing through any remaining queries.
- Practising the GNLBE.

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- In pairs participants discuss how and where to include at least one practise into their daily life going forward.
- Wrap up discussion (includes addressing any concerns for carrying practises forward).

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Appendix J

Intellectual Property Rights Letter



**Director
Research Contracts & Innovation (RC&I)**

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26th June 2018

Ms Ruth Levin-Vorster
PhD Candidate in Neuroscience
Department of Psychiatry and Mental Health
University of Cape Town

By email: ruth@createbridges.co.za

Intellectual Property: Mindfulness-based Relational Health Intervention

Thank you for approaching RC&I (Dr Andrew Bailey) regarding the Mindfulness-based Relational Health Intervention (IP) that you created prior to the commencement of your current studies at UCT and as described in the attachments to this letter, which you supplied. We note that this IP will be used in your research work at the university and confirm that UCT makes no claim to the intellectual property (IP).

Dr Bailey has also been in contact with your supervisor, Dr Fleur Howells who has confirmed the creation of the IP occurred prior to you joining UCT.

Yours sincerely

Signed by candidate

PW Barnard
Director RC&I

cc: Dr Andrew Bailey
Dr Fleur Howells

Mindfulness-based Relational Health Intervention (MBRI)

Developed by Ruth Levin-Vorster in October 2016

The exercises were developed by Ruth Levin-Vorster between 2002 and 2016.

This is an experiential intervention set in the tradition of mindfulness based interventions in which breath plays a central component to training attention, presence and attunement. The intervention targets relational attunement and flexibility, with the goal of equipping individuals with tools to navigate themselves within challenging relationship contexts in a healthier way.

The intervention aims to develop self-awareness of one's character in and out of balance and attunement to one's relational triggers and their physiological, emotional and mental counterparts. This is combined with an emotion regulation strategy that is learnt and practised, and the combination is role-played and trained to promote regulated communication.

The intervention combines mindfulness practises with character analysis processes from the theatre and is underpinned with interpersonal neurobiology principles. It situates itself within the third wave of novel interventions emerging out of Mindfulness Based Cognitive Therapy (MBCT).

The intervention was developed in October 2016 by Ruth Levin-Vorster and emerged out of extensive research in the field of interpersonal neurobiology and social psychology which the author combined with her field of discipline namely theatre directing and actor training.

Mindfulness-based Relational Health:

Run over 6 weeks for 2 hours per week. Daily homework (10-20min)

Week 1: (1hr30 hours)

A talk about relationships – ‘why they’re so difficult and what one can do about it’ (40min)

Information includes:

Principles of interpersonal neurobiology

- The concept of mind in interpersonal neurobiology
- The notion of integration

Brain-body basics:

- The interplay of the relational-mind-brain circuitry
- The brain in stress - regions of the brain that are activated when triggered.
- Neuroplasticity
- Empathy

The talk is based on the work of Daniel Siegel, Brene Brown, Kristin Neff, Barbara Friederikson, Tania Singer, Bud Craig, ‘the divided brain’, Antonio Damasio and Vittorio Gallese amongst others.

Overview of the course – 20min

The Golden Nugget Breathing/Listening exercise (GNBE) (30min)

Located in the mindfulness breathing tradition this exercise activates parasympathetic regulation and promotes altruistic listening and responding.

Participants are guided through this breathing exercise in stages. They are guided to place their feet hip width apart directly under their shoulders. They are instructed to take three deep and slow breaths and gently bring themselves into the room and into their body. Participants are orientated to the ‘core’ area of the pelvis, the ‘belt’ area. This is found by placing four fingers horizontally below the naval. Where the 4th and baby finger lies is where the entire hand should be placed to gently activate the area with touch. They are instructed to gently activate and fill this area of the body with breath. They are asked to notice whether the area is tight, pulling, resisting, aching or soft and fluid etc. The breath is guided into this area. After a few minutes participants are asked to allow a colour to emerge. If it does they are asked to fill this area with the colour and the breath. If it doesn’t they are asked to continue just with the breath. For many the addition of colour seems to trigger an embodied connection to this ‘core’ area.

The exercise can be done standing or sitting. It is preferred to learn the exercise standing as whole body-mind engagement is more accessible in this position, i.e. one is not tempted to rest against the back of the chair.

Located in the mindfulness breathing tradition this exercise activates parasympathetic regulation and promotes altruistic listening and responding.

Homework: to practise the GNBE for 4 min per day daily.

Week 2:

Feedback on the week (20min)

The Golden Nugget Breathing Exercise (GNBE) (10min)

Aspects of self - character analysis 1: (1hr30)

This exercise begins to address different aspects of one's character, which are often contradictory. It explores the participant's character when in balance and when out of balance. In addition it reveals activities that are regularly needed for the individual's character to maintain a mental, emotional, physical and spiritual equilibrium, together with information about what shifts them out of balance.

This is a creative process that utilizes visual and tactile stimuli to prompt an emotional distance between the core self and different aspects of one's character. The individual transfers different elements of their internal self onto external characters that reflect different parts of the self, however not the whole self. The process stimulates a meta-awareness of the self and how it changes and adapts to contextual cues.

The material: sheets of paper, fabric of different kinds, scissors, glue, colour koki and crayons.

The exercise is introduced through the notion of various aspects of the self that emerge within different relationships. For example, with a parent, friend, work colleague, a boss, spouse or romantic partner. An awareness of the normality of this human trait is primed through the introduction.

The exercise:

Write down one aspect of yourself that you like.

Write down one aspect of yourself that you don't like.

Write down one aspect of yourself that you don't understand.

Create a character for each of these parts. Design their clothes from the selection of fabric. Cut and paste them on your paper – a sheet for each character. Name them. Write three characteristics for each one.

Write down 1-3 things that keep each character in balance and three things that overwhelm them.

Now create three additional characters that are the opposite of the original three characters.

Repeat the same process as above.

Add* Reflection questions:
Did you
Journal these reflections.
Discussion in pairs.

Homework:

Participants are asked to hold an awareness of their findings as they go about their lives through the week. Participants are asked to observe when different aspects of themselves emerge. Perhaps additional 'characters' present themselves. In addition participants are asked to implement one ritual that they have identified as keeping them in balance.

The GNBE daily.

The Biography Worksheet: (20 min)

This is a questionnaire to prompt awareness of the early caregiver, environmental and life events that have shaped one's perspective lens, communication and affective style and emotional triggers. (Appendix 1).

It is developed from character development processes.

Week 3:

Feedback on insights from the week (30min)

Relationship triggers and patterning – character analysis 2: (1h15) by Ruth Levin-Vorster

There are two versions of this exercise. Within the corporate sector I will use the second version. The first version can unlock unresolved feelings if there has been early childhood trauma.

1. This exercise is an embodied mindfulness process that prompts the body's implicit memory to surface into conscious awareness with regard to the physiological and emotional signals that early caregiver relationships set in motion (or trigger). The exercise explores the felt dynamic implicit within these primary relationships that might have modelled current relationship patterns and relational reactivity cues.

OR

2. This exercise is an embodied mindfulness process that prompts the body's implicit memory to surface into conscious awareness with regard to the physiological and emotional signals that challenging personal, professional and familial relationships set in motion (or trigger). The exercise develops to explore the physiological, emotional and mental components of these triggers.

The exercise. Lie on the floor or sit on a chair or on the floor against the wall. Be comfortable. Take three deep slow breaths in and out. Feel your back

melting into the floor or into the chair. Bring to mind a stressful personal relationship. Hold it in your mind's eye and observe the dynamic. What does it feel like? What is the texture? Colour? Sound? Notice what is happening to your body in this relationship. Intensify it.

At the end of the exercise: Take 10 deep and slow breaths and bring yourself back into your body and into the room.

This exercise is repeated a further two times for a professional relationship and a familial relationship.

Participants are guided out of the exercise and given a worksheet to fill in (10-15min)

Worksheet questions:

Are there any patterns between the three relationship dynamics?

Are they present in other relationships?

How does each dynamic make you feel about yourself?

Write about a positive relationship dynamic and how this makes you feel.

How would you like the challenging dynamics to shift?

Homework: Participants are asked to observe the physiological, emotional and mental patterns connected to their triggers through the week. They are asked to journal daily for 10-20min on their observations.

Week 4:

Feedback (30min)

The Golden Nugget breathing/listening exercise (10)

The GNBE contextualized. (40min) Ruth Levin-Vorster

The golden nugget breathing/listening exercise is used within an imagined but real stressful relational context to experience the impact of the breathing exercise on emotional reactivity and the quality of listening to the other party involved in the conflict.

Participants are asked to think about a stressful relationship, professional or personal, and the first one that enters their mind. They are asked to locate where they experience the relationship in their body and to intensify the 'feeling'. They are asked what texture the relationship dynamic is, what shape and what colour. Again they are asked to intensify focus on these. Now participants are instructed to move towards and face a wall with enough distance between them to allow for the wall to represent the person they are thinking about. They are asked to begin a conversation with them, which takes place silently in their mind. After 2-3min, participants are asked to release this and to return to the centre of the room. They are guided through the golden/nugget breathing exercise. Subsequently they are asked to return to the same place facing the wall and continue their conversation while

maintaining the awareness of the 'core' breathing. When this is complete, the differences in the two conversations are unpacked.

Feedback (20-30min)

Homework: Participants are asked to continue practising the golden nugget breathing/listening exercise daily and to implement it in a real world context. They are required to journal about the experience. They are asked to continue observations in their journal. Continuing to implement character rituals is encouraged.

Week 5: Role-Play

Feedback (20-30min)

Various challenging relational scenarios are role-played by the group. Participants are instructed to consciously observe their triggers as they arise and intercept them with the golden nugget breathing/listening exercise. Each role-play is unpacked after the enactment.

Homework: Participants are asked to continue practising the golden nugget breathing/listening exercise daily and to implement it in a more challenging real world context. They are required to journal about the experience.

Week 6: Recap and forward intentions:

Feedback (30min)

Recapping all the exercises learnt and ironing through any remaining queries.

Practising the golden nugget breathing/listening exercise.

Exercise: in pairs participants discuss how and where to include at least one practise into their daily life going forward.

Wrap up discussion (includes addressing any fears for carrying practises forward).

Times for the exercises are estimates and may vary slightly.

Appendix K Amendment to name of Intervention



**Director
Research Contracts & Innovation (RC&I)**

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14 November 2018

Ms Ruth Levin-Vorster
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Department of Psychiatry and Mental Health
University of Cape Town

By email: ruth@createbridges.co.za

Dear Ms Levin Vorster

Update to Intellectual Property Relating to Mindfulness-based Relational Health Intervention

UCT acknowledges that you have renamed your intervention: "Theatre-Based Relational Health Intervention" and the name of the name of the Golden Nugget breathing exercises has been changed to the "Golden Nugget Listening/Breathing Exercise".

Thank you for sending us a copy of the revised intervention for our records. I can reconfirm that UCT makes no claim to this intellectual property.

Yours sincerely

Signed by candidate

PW Barnard
Director: RC&I

cc: Dr Andrew Bailey
Dr Fleur Howells

Appendix L

Pilot Study Interview Schedule

Pilot study for the feasibility and acceptability of a

Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no. 068/2019)

INTERVIEW SCHEDULE

A semi-structured interview will be administered to all pilot study participants at the end of the 6-week TBRH intervention, the information obtained will be used to determine the feasibility, acceptability, and whether modifications to the administered TBRH intervention are needed before proceeding with the planned main study, for which a separate ethics application will be submitted.

1. Tell me about your experience of the TBRH intervention you've just done?
2. How do you experience your self-awareness after completing the intervention?
3. How did the exercise in which you looked at different parts of yourself and created characters for them influence your understanding of yourself?
4. How has your ability to keep yourself in balance developed since the intervention?
5. In what way/s has your awareness of the environments and relational dynamics that trigger you developed over the intervention?
6. Which is the element you are most aware of when you are triggered– your physiological sensations, emotions or thoughts?
7. Can you give me an example of the physiological sensations, emotions and thoughts that occur when you become triggered during a relationship?
8. Do you notice a relationship between your physiology, emotions and thoughts?
9. Has your awareness of your perspective lens, how you see the world, developed since the intervention and in what way?
10. How has your ability to self-regulate your emotions and thoughts developed or not during the intervention?
11. Do you apply the GNLBE in your life? When? And where? With whom? If not, please share your reasons.
12. In ways way has your ability to empathize with others developed or not since completing the intervention?
13. What was your experience of using the GNLBE both in an imagined stressful situation within the intervention and outside in the real world? Expand.
14. Have any of your relationships developed over the course of the intervention? Can you provide concrete examples, both positive and negative are applicable?

Questions pertaining to feasibility and acceptability, which only pertain to pilot study:

15. Which exercise did you find most valuable and why?
16. Would you have liked any other information to be included or excluded in the talk in week 1?
17. Tell me about your experience of the Golden Nugget Listening Breathing exercise (GNLBE).
18. Tell me about the experience of the exercise exploring the different aspects of yourself through creating different characters for them and what you found most useful?
19. What did you take away from the relationship triggers and patterning exercise? How has it contributed to understanding your relationship dynamics with significant people in your life?
20. Was the Biography Worksheet in which you explored your environmental, familial, political, religious and other influences useful? If yes, how? If not, why?
21. Tell me about your experience of participating in the role-plays?
22. Tell me about your experience of watching the others in the group?
23. What exercises did you did not enjoy (lacked resonance) or you found didn't contribute anything of value to you?
24. Did you feel you had enough time for the exercises each week? Would you have liked any of the exercises to have been given more or less time?
25. Did you feel safe to explore your internal world within the intervention environment?
26. Describe your experience of interacting with the group?
27. Who do you think this intervention is suited to? E.g. which groups of people/persons would enjoy and benefit from this intervention now you have completed it?
28. Was the venue appropriate for this intervention?
29. Did logging the homework have value for you?
30. Any additional insights or comments that you would like to make?

Neurobiological markers of a Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no 771/2019)

ADVERTISEMENT

Are you interested in improving your relationship with yourself and others?

Following on from a successful pilot study, be part of a study to test the neurobiological markers of a Theatre-Based Relational Health study for my PhD in Neuroscience at the University of Cape Town (*UCT FHS HREC Ref no. 771/2019*). Non-invasive methods will be used to measure neural activity from the scalp (electroencephalography or EEG) and heart rate and respiration.

The Theatre-Based Relational Health intervention aims to provide the following training

- Enhance self-awareness to improve relational health
- Enhance emotion regulation to improve relational health
- Learn to understand your relational patterns and to identify the effects of different relational environments on your physiology, emotions and thoughts.
- Learn to improve your relational health through the regulation of your emotions with self-awareness

If you would like to find out more and whether you are eligible to participate, please contact Ruth Levin-Vorster on email, and she will get back to you

Email address for Ruth: **LVNRUT002@myuct.ac.za**

[Type here]

Facebook groups (reduction of main advert)**For waitlist design:**

Hi All,

I am recruiting 32 participants (woman and men) for a study of a Theatre-Based Relational Health intervention to improve your relationship with yourself and others for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*).

This 6-week TBRH intervention teaches tools for self-awareness and self-regulation.

- Learn to understand your relational patterns and to identify the effects of different relational environments on your physiology, emotions and thoughts.
- Learn to improve your relational health through the regulation of your emotions with self-awareness.

To find out more and whether you are eligible to participate, please contact me - Ruth Levin-Vorster on LVNRUT002@myuct.ac.za

For retest control group

Hi All,

I am also recruiting 16 participants (woman and men) for a study of a breathing intervention to improve your self-awareness and emotion regulation for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*).

This 6-week breathing intervention called The Golden Nugget Listening Breathing Exercise teaches a tool for self-regulation, self-awareness and compassionate listening.

- Learn to improve your relational health through the regulation of your emotions with self-awareness.

To find out more and whether you are eligible to participate, please contact me - Ruth Levin-Vorster on LVNRUT002@myuct.ac.za

[Type here]

Linked-In

Personal:

I am recruiting 32 to test the neurobiological markers of a Theatre-Based Relational Health intervention to improve relationships for my PhD in Neuroscience (*UCT FHS HREC Ref no.771/2019*). Happy to do a brief talk at your offices. Email Ruth on LVNRUT002@myuct.ac.za

Warmly,

Ruth

AND

I am also recruiting 16 participants to test the neurobiological markers of a breathing intervention called the Golden Nugget Listening Breathing Exercise for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*). Email Ruth on LVNRUT002@myuct.ac.za

Warmly,

Ruth

OR

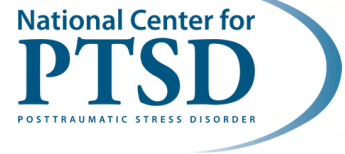
Are you interested in gaining tools to improve your relationship with yourself and others?
Recruiting 48 participants for an intervention study for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*). • Learn to improve your relational health through the regulation of your emotions with self-awareness. Contact Ruth on LVNRUT002@myuct.ac.za

WhatsApp

Are you interested in gaining tools to improve your relationship with yourself and others?

[Type here]

Recruiting 48 participants for an intervention study for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*). • Learn to improve your relational health through the regulation of your emotions with self-awareness. Contact Ruth on LVNRUT002@myuct.ac.za



Appendix N

PTSD Checklist for *DSM-5* (PCL-5)

Version date: 29 August 2023

Reference: Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM-5 (PCL-5) – Standard* [Measurement instrument]. Available from <https://www.ptsd.va.gov/>

URL: <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp>

Note: This is a fillable form. You may complete it electronically.

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PCL-5

Instructions: Below is a list of problems that people sometimes have in response to a very stressful experience. Keeping your worst event in mind, please read each problem carefully and then select one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

Your worst event: _____

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
2. Repeated, disturbing dreams of the stressful experience?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
4. Feeling very upset when something reminded you of the stressful experience?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
8. Trouble remembering important parts of the stressful experience?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
10. Blaming yourself or someone else for the stressful experience or what happened after it?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
12. Loss of interest in activities that you used to enjoy?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
13. Feeling distant or cut off from other people?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
15. Irritable behavior, angry outbursts, or acting aggressively?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
16. Taking too many risks or doing things that could cause you harm?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
17. Being "superalert" or watchful or on guard?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
18. Feeling jumpy or easily startled?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
19. Having difficulty concentrating?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐
20. Trouble falling or staying asleep?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐

Appendix O

Participant Information and Consent Form

Neurobiological markers of a Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no.771/2019)

PARTICIPANT INFORMATION SHEET

Our relationships with our families, our loved ones, our friends and our work colleagues form an important part of our well-being, happiness and health. When our relationships are not working, we can experience a great deal of stress and unhappiness in our lives. Programs that improve our relationships with ourselves have been shown to improve our well-being and happiness, and our relationships with others.

This study is testing a new program (or intervention) that has been developed specifically to improve challenging relationships. It is called a Theatre-Based Relational Health intervention (or program) and it gives you a variety of tools to develop self-awareness of your behavior in your different relationships, a breathing and compassion tool for when your emotions are running wild and a kindness to self or others is needed. These tools are learnt in the context of your relationship with yourself and with those challenging relationships in your life. The Theatre-Based Relational Health intervention will take place over 6 weeks during which time we will meet in a group once a week for 2 hours. Week 3 and week 5 will run longer at 2.5 and 3 hours respectively. It is made up of adapted theatre exercises and awareness-based exercises to develop self-awareness and a breathing exercise to develop emotion regulation.

We have already run a pilot study with overwhelmingly positive results. We want to expand this research with this study and measure if your self-awareness and emotion regulation, compassion and relationships improve before and after the intervention. We will test this in several ways at the start and end of the intervention. You fill in questionnaires that measure self-awareness, emotion regulation and compassion. You will have an individual interview in which you will be asked questions about what changes have taken place in your self-awareness, emotion regulation, compassion and relationships. The interview only happens once in the week after you have finished the intervention. And finally, we will measure your heart and breathing rate in the lab while you are doing a simple computerized task. These measurements will be done at 3 timepoints, one before and two after the intervention. All of the measurements recorded are to determine whether this intervention supports relational health.

All data collected will be made anonymous. This means your name will be removed and replaced with a number. This way your data will stay private. Analyses of the data will be performed to find out the impact of the intervention on self-awareness, emotion regulation and relational health. This information will contribute to future research and training of professionals in the intervention with the aim of helping people improve their relationships.

Criteria for inclusion:

- All participants need to be healthy and within the ages of 25-60 years old.
- Individuals who have not been on prescription medication currently or in the last 6 months, e.g. antidepressants or ARVs or insulin.

- Have either had no exposure to- or have no regular practise of embodied and breathing related interventions.
- Participants need to be fluent in English as the intervention is conducted in English.

Exclusion criteria:

- Participants are to be excluded if they have any cardiovascular or heart problems, as this may affect the record of heartbeat activity, using electrocardiography (ECG) which is used to determine heart rate variability (HRV).

Benefits of participation:

- Receive free 6-week Theatre-Based Relational Health (TBRH) intervention or undergo a 6-week Breathing Exercise.

For those participating in the 6-week Theatre-Based Relational Health (TBRH) intervention:

- Receive tools to become aware of self and how different relationships and contexts affect you.
- Receive tools to become aware of the sensations, emotions and thoughts connected to your relational triggers.
- Receive tools to emotionally regulate and return to a physiological balance. Learn about what activities keep you in physiological balance and return you physiological balance to improve relational health.

For those participating in the 6-week Breathing Exercise only:

Receive a tool to emotionally regulate and bring you into physiological balance.

This research study has been approved by the University of Cape Town's Human Research Ethics Committee (UCT FHS HREC *Ref no. 771/2019*). This study is conducted in accordance to the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013).

Participation is voluntary; no data will be collected unless you as a research participant have signed informed consent. If you want to stop participating in the research project at any time, you can, and an explanation is not required. The study is for research purposes only. Your personal details will be held confidentially, and your name will be replaced with a number, to remove your identity from the data, before any analyses are performed. If the intervention shows positive results, more people will be given access to it and future studies will involve training professionals to teach the intervention. **If you have any queries in regard to the TRBH study, and meet our inclusion criterion and would like to participate in this research please email: Ruth Levin-Vorster LVNRUT002@myuct.ac.za**

If you have any concerns with this research study please email the Principal Investigator, Dr. Adele Marais on adele.marais@uct.ac.za

If you feel that study is not being carried out in accordance with the informed consent form or in accordance with the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013), please contact the HREC office, Asande Mpila: asande.mpila@uct.ac.za; or call her office 021 650 1236.

**These first two pages of information are for the participant and must be read before proceeding to the consent. The consent, following two pages are to be stored securely, by the researcher.*

Neurobiological marker of a Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no. 771/2019)

INFORMED CONSENT

- (1) I understand that this study will measure the neurobiological markers of a Theatre-Based Relational Health (TBRH) intervention designed to train self-awareness and emotion regulation (the ability to stay in balance) to improve relational health.

Yes / No

To participate in this study there are inclusion and exclusion criteria. Please answer yes or no to the following questions to ensure that you are eligible to participate. Please *circle the* relevant response:

- (2) I am between the ages of 25-60 years old.

Yes / No

- (3) I am not currently, and have not taken chronic medication for a medical condition in the last 6 months, for example, anti-depressants, Insulin, or ARV's.

Yes / No

- (4) I have no regular practice of breathing related interventions such as yoga or meditation or embodied reflective practices such as journaling.

Yes / No

- (5) I am fluent in the English language.

Yes / No

Procedure requirements and intervention format and information. Please answer yes or no to the following questions to ensure that you understand what you are committing to. Please *circle the* relevant response:

- (6) I understand that I will experience the intervention in a group ~~format~~, up to 16 participants in a group, and I am able to participate in a group format.

Yes / No

- (7) I understand this research project will require my participation in an intervention delivered over 6 weeks, for two hours of contact time per week (week 3 and 5 are 2.5hours and 3 hours respectively).

Yes / No

- (8) I understand before and after the TBRH intervention I will complete several questionnaires.

Yes / No

- (9) I understand before and after the TBRH intervention my heart and breathing rate will be measured in the laboratory while I am at rest and doing simple computerized tasks. This will take place in the daytime.

Yes / No

- (10) I understand at the end of the 6 weeks I will interviewed about the TBRH intervention which will be audio-recorded.

Yes / No

- (11) I understand that this study comprises adapted theatre exercises and awareness-based exercises to develop self-awareness and a breathing exercise to develop emotion regulation.
Yes / No
- (12) I understand that the TBRH intervention is aimed at improving self-awareness and emotion regulation to improve relational health.
Yes / No
- (13) I understand that the data collected from this research study will be anonymized, i.e. my name will not be attached to the data collected.
Yes / No
- (14) I understand that the information I provide by participating in the research project will be held confidentially and will only be used for research purposes of this study.
Yes / No
- (15) I understand that the feedback sessions within the group will contribute to the data collection. These sessions will be audio-recorded.
Yes / No
- (16) I understand all personal identifiers will be removed from the data shared in order that the person cannot be recognized within the data reporting.
Yes / No
- (17) I understand that I will not receive any remuneration directly except for the tools within the intervention itself and that this study is only for research purposes.
Yes / No
- (18) I understand that I am receiving tools to improve self-awareness and emotion regulation at no cost.
Yes / No
- (19) I understand that my relational health may not improve as a result of the intervention.
Yes / No
- (20) I understand that as I become more self-aware, I might experience some discomfort as I learn about negative aspects of my relational patterning.
Yes / No
- (21) I understand that participation in this study is voluntary, and I will be able to withdraw from this study at any given time and this withdrawal will bear no negative effect on my person or wellbeing.
Yes / No
- (22) I understand that the data collected will form part of a Doctor of Philosophy degree, however I will not receive individualized feedback.
Yes / No

In addition:

The University of Cape Town (UCT) has insurance cover for the event that research-related injury or harm results from your participation in the study. The insurer will pay all reasonable medical expenses in accordance with the South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI) in the event of an injury or side

effect resulting directly from your participation in the study. You will not be required to prove fault on the part of the University.

The University **will not be liable** for any loss, injuries and/or harm that you may sustain where the loss is caused by:

- The use of unauthorised medicine or substances during the study
- Any injury that results from you not following the protocol requirements or the instructions that the study doctor may give you
- Any injury that arises from inadequate action or lack of action to deal adequately with a side effect or reaction to the study medication
- An injury that results from negligence on your part

“By agreeing to participate in this study, you do not give up your right to claim compensation for injury where you can prove negligence, in separate litigation. In particular, your right to pursue such a claim in a South African court in terms of South African law must be ensured. Note, however, that you will usually be requested to accept that payment made by the University under the SA GCP guideline 4.11 is in full settlement of the claim relating to the medical expenses. “

An injury is considered study-related if, and to the extent that, it is caused by study activities. You must notify the study research immediately of any side effects and/or injuries during the trial, whether they are research-related or other related complications.

UCT reserves the right not to provide compensation if, and to the extent that, your injury came about because you chose not to follow the instructions that you were given while you were taking part in the study. Your right in law to claim compensation for injury where you prove negligence is not affected. Copies of these guidelines are available on request.

This consent form has been read and understood by:

Participant's name _____

Participant's email address: * _____

Participant's cell no. * _____

**This contact information will only be used towards completing your participation in this research study*

Participant's signature _____ Date of consent signing _____

Researcher who collected completed informed consent: **Ruth Levin-Vorster**

Researcher's signature _____ Date of confirmatory signing _____

Appendix P

Recruitment Advertisement for Breathing Only Intervention

Looking for 16 participants (all genders) to take part in a breathing intervention to improve your self-awareness and emotion regulation for my PhD in Neuroscience (*UCT FHS HREC Ref no. 771/2019*).

This 6-week breathing intervention called The Golden Nugget Listening Breathing Exercise teaches a tool for self-regulation, self-awareness and compassionate listening. The program runs once a week over 6 weeks starting mid-July 2021. Sessions are 30min and run in the evening via zoom.

Criteria for inclusion:

- All participants need to be healthy and within the ages of 25-60 years old.
- Individuals who have not been on prescription medication currently or in the last 6 months, e.g. antidepressants or ARVs or insulin.
- Have either had no exposure to- or have no regular practise of embodied and breathing related interventions.

Exclusion criteria:

- Participants are to be excluded if they have any cardiovascular or heart problems, as this may affect the record of heartbeat activity, using electrocardiography (ECG) which is used to determine heart rate variability (HRV).

To find out more please contact me - Ruth Levin-Vorster on LVNRUT002@myuct.ac.za

Appendix Q

Referral therapists:

Soraya Nair - 0878976690

Kate Leinberger - kateleinberger@gmail.com

Ereshia Benjamin - ereshia.benjamin@uct.ac.za (women only)

Marlize Swanepoel - Drama Therapist

Email: info@marlize.co.za

Nonkululeko Busiko - Drama Therapist (Jhb based - via zoom)

Email: nonkululekobusika@gmail.com

Louise Mina - +27 21 461 4237

Clint Maggott - 0658184907

Wahbie Long - wahbie.long@uct.ac.za

Gary Viljoen - 082 5631470 (please WhatsApp)

Lesley Palmer – Drama Therapist

lesley@presenceinaction.co.za

Karen Cohen – Clinical Psychologist

Email: kcohenpsych@gmail.com

Ilse Jordaan - ilsejordan@iafrica.com

Ruth Scott - 0722149846

SADAG (South African Depression and Anxiety Group): <http://www.sadag.org/>

Cape Mental Health in Observatory offers free counselling services: <http://www.capementalhealth.co.za/contact.html>.

The Counselling Hub Woodstock: <https://www.counsellinghub.org.za/work-with-us>

Appendix R

Main Study Interview Schedule

Main Study - Theatre-Based Relational Health Intervention

(UCT FHS HREC Ref no. 771/2019)

INTERVIEW SCHEDULE

1. How has your relationship with yourself developed through the intervention?
2. How do you feel this is impacting your relationship with significant others in your life?
3. How did working with different parts of yourself through characters impact your relationship with yourself? Could you give me an example of the characters and how they showed up in your relationships?
4. What was it like to look at the characters at the end of the program?
[What insights emerged through awareness of different parts of self as you stepped into different relationships] – think we can delete this?
5. What context or dynamics activates the different characters arrival? What insights emerged for you through this? [delete?]
6. Are you doing any self-care activities to keep yourself in balance that you weren't doing before the intervention? (How did self-care develop through the intervention)
7. Tell me about your experience of doing the GNLBE?
8. Do you maintain a practice routine?
9. Do you apply it in your real life?
10. How would you view your ability to bring your emotions into balance has developed since the intervention?
11. How has the awareness of your reactivity and how it manifests in your nervous system developed through the intervention?
12. How does understanding your nervous system help you in your relationship with yourself?
13. How has insight into how your nervous system responds in stressful relationships impacted how you navigate the relationship. Can you give me an example?
14. Can you describe the experience of having a conversation when you feel threatened vs when you feel safe?
15. What insights did you gain from understanding your relational triggers and early caregiving environment? Did anything surprise you?

16. Are any of your past relational patterns playing out in your present relationships?
17. In which way has your understanding of your perspective lens influenced your relationships?
18. Can you provide specific examples of how your relationships have developed through the intervention? [delete? – repetitive]
19. How has your ability to connect with others or not developed through the intervention?
20. How has your ability to be authentic in relationships developed or not through the intervention?
21. Tell me about how your compassion towards yourself has developed or not from the intervention.
22. What is the biggest take away for you from participating in the intervention?
23. How would you describe relational health?
24. How would you describe this program to a friend?
Who would you recommend this program to?
25. Any additional comments? Do you want to add anything that I didn't ask or we haven't spoken about?

Online questions:

1. This intervention was originally meant to be in-person and then owing to Corona had to move online.
2. How did you find the online experience? What did you like about it? What did you find challenging about it?
3. Have you done an online personal growth program before? Was the online experience the same or different?

Corona questions related to relationships:

E.g. Do you think Covid impacted your relationships, if so how?

Appendix S

Ethics Approval for Pilot Study



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room E53-46 Old Main Building
Groote Schuur Hospital
Observatory 7925

Telephone [021] 406 6626

Email: shuretta.thomas@uct.ac.za

Website: www.health.uct.ac.za/fhs/research/humanethics/forms

01 April 2019

HREC REF: 068/2019

A/Prof Fleur Howells
Psychiatry & Mental Health
Office H37, H-Floor, OMB

Dear A/Prof Howells

PROJECT TITLE: PILOT STUDY FOR THE FEASIBILITY AND ACCEPTABILITY OF A THEATRE-BASED RELATIONAL HEALTH INTERVENTION (PHD CANDIDATE - MRS R LEVIN-VORSTER)

Thank you for submitting your response to the Faculty of Health Sciences Human Research Ethics Committee dated 20 March 2019.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until 30 March 2020.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

The HREC acknowledge that the student, Ruth Levin-Vorster will also be involved in this study.

Yours sincerely


PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
NHREC-registration number: REC-210208-007

HREC 068/2019

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code of Federal Regulation Part 312.61, 312.62 and 312.63.



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room G50-46 Old Main Building
Groote Schuur Hospital
Observatory 7925

Telephone [021] 406 6492

Email: hrec-enquiries@uct.ac.za

Website: www.health.uct.ac.za/fhs/research/humanethics/forms

21 January 2020

HREC REF:771/2019

A/Prof F Howells

Division of Psychopharmacology & Biological Psychiatry
Department of Psychiatry & Mental Health
H37, GSH

Dear A/Prof Howells

PROJECT TITLE: NEUROBIOLOGICAL MARKERS OF A THEATRE-BASED RELATIONAL HEALTH INTERVENTION (SUB-STUDY _ 068/2019) (PHD DEGREE - MRS R LEVIN-VORSTER)

Thank you for your response letter dated 15 January 2020, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 January 2021.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Mrs Ruth Levin-Vorster will also be involved in this study.

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate Institutional approval, where necessary, before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Confidentiality agreement for conducting semi structured interviews:

The semi-structured interviews form part of the research study 'Pilot study for the feasibility and acceptability of a Theatre-Based Relational Health Intervention' and has been approved by the University of Cape Town's Human Research Ethics Committee (UCT HSF HREC 068/2019). This study is conducted in accordance to the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013).

I understand that the information I the interviewing/transcribing must be held in confidentially Yes / No

Interviewer/Transcriber's name:

Natalie Cunningham

Interviewer/Transcriber's signature

[Signature]

Date of signing

20 June 2019

Researcher who is analyzing the interviews: Ruth Levin-Vorster

Researcher's signature _____

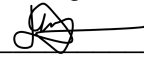
Date of signing _____

Confidentiality agreement for transcribing the interviews of participants in the Theatre-Based Relational Health intervention

I understand that the information I am engaging with must be held in confidentiality.

~~Y~~es / No

Transcriber's name: Donna Ingram

Transcriber's signature  _____

Date of signing 11 May 2021 _____

Researcher who is employing research assistant: Ruth Levin-Vorster

Researcher's signature _____

Date of signing _____

Confidentiality agreement for conducting semi structured interviews:

The semi-structured interviews form part of the research study 'Pilot study for the feasibility and acceptability of a Theatre-Based Relational Health Intervention' and has been approved by the University of Cape Town's Human Research Ethics Committee (UCT HSF HREC 068/2019). This study is conducted in accordance to the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013).

I understand that the information I the interviewing/transcribing must be held in confidentially Yes / No

Interviewer/Transcriber's name:

Natalie Cunningham

Interviewer/Transcriber's signature

[Signature]

Date of signing

20 June 2019

Researcher who is analyzing the interviews: Ruth Levin-Vorster

Researcher's signature _____

Date of signing _____

Confidentiality agreement for the transcription of audio-recorded semi structured interviews:

The semi-structured interviews form part of the research study 'Pilot study for the feasibility and acceptability of a Theatre-Based Relational Health Intervention' and has been approved by the University of Cape Town's Human Research Ethics Committee (UCT HSF HREC 068/2019). This study is conducted in accordance to the human research guidelines stipulated by the Declaration of Helsinki (World Medical Association, 2013).

I understand that the information I am transcribing must be held in confidentially **Yes / No**

Transcriber's name: Zimkhitha Ndinga

Transcriber's signature  Date of signing 07 Oct 2019

Researcher who is analyzing the interviews: Ruth Levin-Vorster

Researcher's signature _____

Date of signing _____

Appendix V

Reliability Metrics

Cronbach's Alpha Tables for Study 1 and Study 2

Cronbach's Alpha Study 1

MAIA-2	Cronbach Alpha	
	Lab 1	Lab 2
Noticing	0.75	0.89
Not-Distracting	0.93	0.52
Not-Worrying	0.72	0.59
Attention Regulation	0.90	0.88
Emotional Awareness	0.61	0.67
Self-Regulation	0.84	0.90
Body Listening	0.78	0.80
Trusting	0.82	0.78
FFMQ		
Observe	0.59	0.75
Describe	0.78	0.87
Acting with Awareness	0.89	0.82
Non-Judgement of Inner Experience	0.89	0.87
Non-Reactivity to Inner Experience	0.87	0.76
SCS		
Self-Kindness	0.86	0.59
Self-Judgement	0.72	0.37
Common Humanity	0.74	0.51
Isolation	0.86	0.79
Mindfulness	0.27	0.82
Over-Identification	0.88	0.76
Total Score	0.85	0.80

STIA-S	0,93	0.91
STIA_T	0.87	0.87

Cronbach's Alpha Study 2

MAIA-2	Cronbach Alpha		
	Lab 1	Lab 2	Lab 3
Noticing	0.72	0.68	0.77
Not-Distracting	0.83	0,86	0.90
Not-Worrying	0.65	0.70	0.90
Attention Regulation	0.90	0.82	0.89
Emotional Awareness	0.83	0.83	0.82
Self-Regulation	0.74	0.68	0.60
Body Listening	0.83	0.86	0.91
Trusting	0.83	0.85	0.88
FFMQ			
Observe	0.74	0.72	0.83
Describe	0.94	0.95	0.98
Acting with Awareness	0.86	0.90	0.90
Non-Judgement of Inner Experience	0.91	0.93	0.97
Non-Reactivity to Inner Experience	0.82	0.76	0.77
SCS			
Self-Kindness	0.77	0.86	0.86
Self-Judgement	0.86	0.86	0.89
Common Humanity	0.77	0.83	0.82
Isolation	0.76	0.82	0.85
Mindfulness	0.64	0.72	0.69
Over-Identification	0.70	0.76	0.82
Total Score	0.92	0.94	0.94
STIA-S	0.88	0.93	0.95

STIA_T	0.93	0.94	0.97
--------	------	------	------