JOURNAL OF QUANTUM SCIENCE OF CONSCIOUSNESS

RESEARCH ARTICLE
OPEN ACCESS

DOI: 10.69573/jqsc.2026.4.1.21-85
Year: 2026, Volume: 04, Issue: 01, Pages: 21-85
Original Article

Received 02.01.2026
Accepted 21.01.2026
Published 05.02.2026

Recovery from intergenerational trauma using quantum field entanglement: A therapeutic case study

By Imogen K. Salzman, D-IM, PhD, MAPS, FCCOUNP

Corresponding author
imogen.salzman@gmail.com
upweypsychology@gmail.com

Published By
www.quantumjournalofconsciousness.com

Electronic ISSN No. 2583-7788

Abstract

Complex post traumatic stress can be both cause and consequence of migration to Australia. Over time untreated complex post traumatic stress becomes intergenerational trauma where responses to trauma are established in interpersonal relationships, maintained as cultural norms and constellated in the restricted expression of the self. The trauma self emerges characterized by trauma responses, such as dissociation, that obstruct recovery. The focus of contemporary treatment, such as cognitive behavior therapy or eye movement desensitization reprocessing, is symptom reduction whereas the focus of quantum medicine goes further to include the restoration of the self. The approach of process oriented psychology is the result of integrating quantum theory concepts, such as quantum collapse, entanglement, fields and the role of the observer, with applied psychology. The present study used a repeated measures experiment design to investigate the effects of quantum entanglement between therapist and client, using applied process oriented psychology, on dissociation in the treatment of complex post traumatic stress following exposure to intergenerational trauma. Participants (N = 13), seven women and six men ranging in ages from 21 to 72 years, who scored a three or more on the Primary Care Post Traumatic Stress Disorder Screen for DSM-5, indicated a history of intergenerational trauma during treatment and who had also completed at least 18 months of treatment, were recruited from my practice records. Dissociation was measured before and after treatment using the Shutdown Dissociation Scale (SDS) and the Dissociative Experiences Scale (DES). A one tailed Wilcoxon signed rank test was conducted to compare median scores before and after treatment. A statistical difference between median scores for the SDS was found before (Md = 26, n = 13) and after treatment (Md = 8, n = 13), z = -3.18, p < .05. Similarly for the DES, median scores before (Md = 44, n = 13) and after treatment (Md = 24, n = 13), z = -3.18, p < .05, were found to be significantly different. A moderately large effect size was found for both measures, r = .62. Results are discussed in terms of the quantum entanglement within the therapeutic relationship and the relevance of quantum medicine in the health care of the future.

Keywords. *field, quantum entanglement, quantum collapse, dissociation, trauma, intergenerational trauma, complex trauma, quantum medicine, process oriented psychology, complex posttraumatic stress disorder, CPTSD, therapeutic relationship, quantum healing, consciousness*

1) INTRODUCTION

1.1 The Problem

Australia is both a very young and a very old, even ancient, country. Archeological evidence indicates First Nations people arrived in Australia at least 60 000 years ago (Cawthorne, n.d.; National Museum of Australia [NMA], 2022). Australia became a colonial settlement but not without substantial loss of life and extreme opposition from the First Nations people (Colonial Frontier Massacres in Australia, 1788-1930, 2025; Perkins, 2022). Allam and Evershed (2025) reported at least 10374 Aboriginal or Torres Strait Islander people were killed in the course of establishing a colonial settlement and approximately half of all the recorded massacres were carried out by police and other government agents. Captured and or dispossessed Aboriginal men were pressed in to military service and ordered to carry out these duties as the colonists increased their control of territory over time (Perkins, 2022; Rowley, 1970). Australia was established as a colonial nation but not without leaving a legacy of trauma.

Australia has relied on migration to expand since Captain Arthur Phillip arrived in 1788 with the First Fleet in Botany Bay to establish the first settlement (Mence et al., 2017). The journey to Australia and the events that inspired individuals and family groups to leave their homeland and make a new home in Australia are varied, powerful and complex (Immigration Museum, n.d.). Extreme political and economic circumstances are common reasons people seek to immigrate to Australia (Australian National Maritime Museum, n.d.). This means Australia, as a nation and place, is home to members of every culture and country on Earth. Each person and family that has migrated to Australia also brought their stories, struggles, beliefs and histories with them. Many sought sanctuary in Australia to escape persecution, horror and war. They also brought wounds. Sometimes those wounds can be carried by many generations before they are healed.

Complex post traumatic stress can develop as the cause or consequence of migration. Trauma is considered complex when describing the case of an individual who has been exposed to multiple, as distinct from one, incidents of trauma (Herman, 1992b). Exposure to complex trauma resulted in a perpetual sense being anxious, fearful and feeling unsafe. Also, the wound of being dispossessed of a place to call home and the loss of a sense of belonging and protection is not resolved by migration alone. Forms of trauma can be induced in the course of arriving and adapting to a new culture and a new place. Individuals and family groups are challenged to face the hardship of isolation and alienation as they adjust and try to integrate living in a new way, far from the security of the familiar. The process and experience of arrival in Australia likely happens progressively over an individual's life and even over generations in the life of a family group. Healing from the reasons that compelled immigration also happens progressively as a sense of safety and familiarity grows.

Untreated or unresolved symptoms of complex post traumatic stress can develop in to cultural norms and behavior habits which perpetuate the transmission of trauma from generation to generation. This phenomenon is known as intergenerational trauma (Rakoff, 1966).

Individuals growing up in environments characterized by intergenerational trauma have multiple difficulties coping with the demands of adulthood. They exit developmental stages with a distorted sense of self where they have learned to dissociate from aspects of human experience as a way to cope with perpetually unmet needs for safety, guidance and support (Herman, 1992b; Schore, 2003). This sense of self defined by exposure to complex trauma throughout childhood is normalized as there is no alternative modelled and is perpetuated by being passed on as a cultural norm. The skills and understandings of negotiation within relationships are diminished. Both intrapersonal and interpersonal domains, that is the relationship an individual has with themself and the relationships that develop between individuals are affected by this process. Patterns of relating are organized around different kinds of abuse, such as physical, sexual, economic and substance use to name a few. The potential sophistication of culture offering multiple adaptive responses to a given circumstance is reduced to basic displays of dominance and tyranny to meet survival needs or achieve goals.

The traumatized self or trauma self that emerged from exposure to complex trauma during key developmental experiences is a diminished departure from the potential and coherence of the healed authentic self (Herman, 1992b; Schore, 2003). The transmission of intergenerational trauma is maintained by the prevalence of the trauma self in the following way. The healing response, inherent within all biological systems, is primed to explore and adapt by attempting a new behavior or a new response to an old stimuli or situation. Curiosity, for example, inspired an individual to take a risk or try something unfamiliar in an attempt to learn and or adapt. The curiosity that inspired the individual to explore new possibilities is then punished with ridicule, exclusion and shame as community members are triggered and reenact recollected incidents of their own personal trauma and consolidate maladaptive cultural norms. The expression of the trauma self is reinforced to avoid social exclusion. The community response is consistent with the phenomenon known as the tall poppy syndrome where individual achievement or success is denigrated and resented by members of the community (Peeters, 2004; School of Literature, Languages & Linguistics: ANU College of Arts & Social Sciences, 2017). Tall poppy syndrome is an example of the way in which the trauma self within Australian communities is maintained. The trauma self is reinforced by learning to avoid exploration, risk taking, adaptation and ultimately healing and recovery.

Transformation of the trauma self in to the healed authentic self can be facilitated through the quantum entanglement present within the therapeutic relationship. A strong foundation of the therapeutic relationship between client and therapist is needed for translation from superposition to embodied experience. The

therapeutic relationship is developed as a kind of agreement between client and therapist where each party, or a conscious aspect of each party, agrees to the general goal of improving and transforming the client's experience of symptoms. The therapist built the necessary foundation by approaching the therapeutic work and the client with compassion, acceptance and curiosity about the client's experience and internal process whilst maintaining a non-judgmental, open, receptive position. The contribution of the therapist's awareness, focus and dedication developed the therapeutic relationship in to a system with qualities indicative of a quantum field. The therapeutic experience required client and therapist to both be the observer and the observed. The position of the observer is used to notice and describe what is happening within and between themselves during therapy sessions. Potential held in superposition can be perceived though imagination or direct experience and enacted. The trauma self is moved towards the healed authentic self through the awareness practice during sessions of noticing, following, observing, describing, expressing and embodying what is happening between therapist and client.

1.2 The Purpose of the Study

The paradigm of quantum physics as applied to medicine, psychology and healthcare sits on the cutting edge of modern scientific understanding not only of biological systems but of consensus reality itself. Investigating the application of quantum physics concepts to healthcare interventions is made more complex and difficult due to the phenomenon of quantum entanglement, quantum collapse and the role of the observer. The implication of quantum entanglement indicates an absence of absolute separation between the observed and the observer thereby calling in to question the assumption of causation. Similarly quantum collapse suggests perceived reality is selected, by the act of observation, from near infinite potentials held in superposition. The role of the observer, therefore, interferes with experimental outcomes. The implications of these three elements, when considered together, question the veracity of the canon of mainstream science. The paradigm of quantum physics describes a perplexing universe of the very small that inconveniently opposes the classical perspective of the much larger, which itself is valid and meaningful for much of the phenomenon encountered in the material universe. Despite these difficulties, quantum physics also describes phenomenon that may be investigated experimentally and applied therapeutically.

The purpose of this study was to demonstrate the therapeutic application of quantum physics principles in the case of post traumatic stress disorder (PTSD) with complex presentation resulting from exposure to intergenerational trauma. The principles of quantum physics were represented in the therapeutic interventions used and constellated in the therapist's awareness as the agent of change. The therapeutic interventions employed were taken from process oriented psychology which is an approach that integrates the practice of Jungian psychology with quantum physics. This study examined the phenomenon of quantum

entanglement and demonstrated the role of the therapist's awareness in facilitating recovery from intergenerational trauma.

2) LITERATURE REVIEW

2.1 Intergenerational Trauma

The conceptualization of intergenerational trauma as a clinical phenomenon was first considered in response to the unique psychiatric and behavioral presentation in treatment of holocaust survivors (Rakoff, 1966 as cited in Yehuda & Lehrner, 2018). Rakoff (1966) initially described intergenerational trauma in the following way, "The parents are not broken conspicuously, yet their children, all of whom were born after the holocaust, display severe psychiatric symptomatology. It would almost be easier to believe that they, rather than their parents, had suffered the corrupting, searing hell" (Yehuda & Lehrner, 2018, The origins of studies of intergenerational trauma section). Initially mechanism of transmission was assumed to be psychological rather than biological (Sigal & Rakoff, 1971). Children became unwitting containers for non-verbal expression of post traumatic stress symptoms and unconscious enactment of the traumatic events experienced by the parents (Barocas & Barocas, 1980; Kestenberg, 1980). Attachment style, that is the development of insecure attachment between parent and child, was identified by Bar-On et al. (1998) as the mechanism by which intergenerational trauma was transmitted. Patterns of interpersonal relating within in families and during childhood development are indicated as one of the ways in which generational trauma is transmitted.

The nature of generational trauma transmission continues to be investigated. Kellerman (2001) reviewed findings regarding psychopathology in children of Holocaust survivors and found no significant difference between survivor offspring and comparative groups. Kellerman (2001) did however identify a predisposition for offspring to develop PTSD, multiple difficulties in the separation individuation developmental process in addition to both some resilience and some vulnerability when challenged to cope with stress. O'Toole et al. (2016) investigated the intergenerational transmission of PTSD in families of Australian Vietnam veterans and found a paternal diagnosis of PTSD increased the risk of PTSD in both sons and daughters. Schechtner et al. (2007) examined the effect of maternal exposure to family violence, maltreatment, and PTSD on the development of mental representations of self and caregivers in young children. They found maternal experience of domestic violence and severity of violence related PTSD symptoms strongly predicted dysregulated aggression, perceptual bias towards danger and distress in addition to withdrawal from and avoidance of conflicts. Yehuda and Lehrner (2018) suggest biology plays a role in the transmission of intergenerational trauma through epigenetics. These authors propose biological transmission may occur through developmentally programmed effects and or due to epigenetic changes associated with preconception trauma affecting the germline and in turn impact fetoplacental interactions. These findings indicated the mechanism for intergenerational trauma appeared to be both biological and psychological therefore and an effective

treatment approach would needs to address both elements.

2.2 Post Traumatic Stress Disorder

2.2.1 Diagnostic Considerations

Complex trauma, distinct from single or simple trauma, is not currently considered a unique category for diagnostic purposes. The fifth edition text revision of the Diagnostic Statistical Manual of Mental Disorders (5th ed.; DSM-5-TR; American Psychiatric Association, 2022) used by mental health professionals to make diagnoses distinguishes between cases of singular or discreet and repeated or continuous incidents of trauma. The DSM-5-TR stipulates the former meets the criteria for a PTSD diagnosis whilst the latter does not. The rationale for this exclusion was due the insufficiency of evidence distinguishing the complex trauma presentation from the traditional perspective on PTSD and also from the case of other diagnoses such as borderline personality disorder (Cutlip et al., 2023). Rosen et al. (2008) identified several diagnostic concerns regarding PTSD prior to the release of the fifth edition of the Diagnostic Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) in 2013. These authors observed PTSD is distinct from other prescribed as the necessary etiology required stipulates exposure to a specific set of traumatic stressors. Developmental trauma or exposure to trauma in childhood was not specifically required to meet the DSM-5-TR PTSD diagnostic criteria (Schmid et al., 2013). Childhood exposure to adverse events is, however, a risk factor for the development of PTSD in later life (Copeland et al., 2007; Widom et al., 2008). Prior to the release of the DSM-5 in 2013, Spitzer et al. (2007) cautioned against considering PTSD as a syndrome and advocated for tighter diagnostic criteria. They observed a subsequent risk of the potential to conflate separate diagnoseable conditions such as depression co occurring with a phobia and thereby mirroring PTSD and potentially contaminating research findings. Sheeringa (2024) employed factor analysis to revise the DSM-5-TR diagnostic criteria for PTSD and concluded the findings did not support the use of factor analysis because factors derived from diagnostic criteria were not sufficiently homogeneous. The conceptualization of PTSD using the DSM-5-TR diagnostic criteria is limited in capturing more complex trauma presentations. This is particularly true if the exposure to trauma stressors is repeated or continuous as can happen within a close relationship or during childhood development.

2.2.2 Complex Trauma Presentation

Some research findings have indicated complex trauma to be a clinically distinct kind of trauma. Herman (1992a; 1992b) suggested trauma was complex rather than simple or singular in circumstances of prolonged and repeated trauma exposure. According to Herman, complex PTSD develops when the victim is in a state of captivity and under the control of a perpetrator of violence. Herman (1992a) described this kind of relationship that as being one of coercive control where the victim is deprived of autonomy and self determination over their body and life circumstances. Conditions of coercive control can develop in

prisons, concentration camps, labor camps, religious groups, brothels, other situations of sexual exploitation, slavery and family groups among others (Herman, 1992a). Complex PTSD has been found to be clinically different from PTSD in three observable ways. “The first is symptomatic; the symptom picture in survivors of prolonged trauma often appears to be more complex, diffuse, and tenacious than in simple PTSD. The second is characterological; survivors of prolonged abuse develop characteristic personality changes, including deformations of relatedness and identity. The third area involves the survivor’s vulnerability to repeated harm, both self inflicted and at the hands of others” (Herman, 1992a, p. 379). Symptoms indicative of complex trauma include “shame, feeling permanently damaged and ineffective, feelings of threat, social withdrawal, despair, hostility, somatization and a diversity from pervious personality” (Giourou et al., 2018, para. 5). Additional characteristics of complex PTSD involve disturbed self organization as indicated by dysregulated affect, negative perception of self, distorted perception of the perpetrator thereby contributing to the formation of dysfunctional relationships and interpersonal relationship difficulties (Bryant, 2010; Cloitre et al., 2011; Reed et al., 2016). Complex and simple trauma can be distinguished in terms of their symptom constellation, etiology and impact on the self.

Clinicians providing trauma treatment have also reported a meaningful difference between simple and complex trauma. Cloitre (2021) conducted a meta anlalysis of over 40 studies across 15 countries. Their findings replicated previous results where Cloitre et al. (2020) consistently showed clinicians determining a difference in presentation between simple and complex PTSD. Maercker et al. (2022) observed consistency in symptoms of disturbed in self organization across situations irrespective of exposure to a triggering stimulus in cases of complex PTSD as compared to inconsistent symptom expression in the case of PTSD. These authors also found increased functional impairment coping with the demands of day to day living in the case of complex PTSD as compared with PTSD. Maercker et al. (2022) observed a higher prevalence of comorbidities occurring in cases of complex PTSD including symptoms of dissociation, somatization and psychosis in addition to substance use disorders, depression and anxiety disorders among others. Complex PTSD appears to be a disorder of trauma both similar to PTSD, in terms of the negative impact trauma exposure has on the individual’s capacity to adapt, and also distinct from PTSD, in terms of the damage sustained and injury to the individual’s concept of self.

2.3 Mainstream Approaches to Trauma Treatment

2.3.1 Cognitive Behavioral Therapy (CBT)

CBT is the most recommended and preferred treatment approach worldwide for PTSD (Kar, 2011; World Health Organization [WHO], 2024). The American Psychological Association (2017a) implemented a practice guideline and policy in 2017 that recommended CBT as the most effective approach to trauma treatment. CBT is one of the therapeutic approaches

approved by the Australian Government, Department of Health and Aged Care to receive a medicare rebate to support public access to mental health treatment (Australian Government Department of Health & Aged Care [DOH&AC], 2024). Rebated psychology services were first introduced in Australia in 2006. The CBT approach to trauma treatment employs a constellation of techniques that have the dual goal of reducing symptoms and improving functioning. The CBT approach involves the therapist and client form a collaborative relationship. The client is progressively encouraged to identify, examine, reflect, review and challenge their cognitive processes, beliefs, perceptions, assumptions and their behavior patterns, habits, actions and responses to trauma triggering situations and stimuli (American Psychological Association [APA], 2017a; Psychology Today, 2022). The CBT approach to trauma also incorporates planned exposure to trauma narratives and stimuli triggering emotions, memories and or trauma responses whilst ensuring the client maintains a sense of autonomy, choice and control over the exposure experience (APA, 2017a). This approach has been found to consolidate self confidence, restore a sense of predictability and reduce the prevalence of avoidance and escape behaviors.

Psychoeducation is an aspect of the CBT approach that is focused on educating the client as to the etiology of trauma and how elements of treatment work. Applying CBT as a learning process has the effect of enlisting the client as a leader in their own recovery, motivate participation and facilitate compliance with treatment protocols (Psychology Today, 2022). The efficacy of CBT in clinical practice for the treatment of trauma and PTSD has been thoroughly investigated and researched over many decades. (Mavranezouli et al., 2020; Ramirez de Arellano et al., 2014; Thielemann et al., 2022). CBT has been found to be an effective trauma treatment approach that is established by clinical literature and largely endorsed by practice guidelines and health organizations around the world.

2.3.2 Eye Movement Desensitization and Reprocessing (EMDR)

EMDR is another widely used therapeutic approach to the treatment of PTSD (Valiente-Gómez et al., 2017; WHO, 2024). The American Psychological Association (2017a; 2017b) conditionally recommends the use EMDR in their practice guidelines and treatment policy for PTSD treatment. EMDR is also included as one of the treatment approaches approved by the Australian Government, Department of Health and Aged Care and is eligible for a medicare rebate to support public access to mental health care in Australia (DOH&AC, 2024). Shapiro (1989) first introduced the idea of using eye movement desensitization to treat trauma memories. Shapiro (1989) proposed eye movements were fundamental to desensitizing behavioral responses to trauma memories. Subsequently, EMDR techniques were expanded to include other forms of rhythmic bilateral, left and right, stimulation such as using tones or taps (Shapiro, 1994).

Despite its relatively recent development, EMDR has an established presence in the clinical literature demonstrating its efficacy in

trauma treatment (Torres-Giménez et al., 2024; Yunitri et al., 2020). Shapiro (2014) reviewed 24 randomized controlled trials demonstrating positive effects using EMDR therapeutic techniques for treatment in cases of emotional trauma and other adverse life experiences. Additionally Shapiro (2014) reviewed 12 studies where administration of the eye movement component of EMDR was found to be associated with a reduction in symptom intensity of reported negative emotions and for memories of disturbing visual images. Shapiro (1995; 2001; 2007) proposed the presence of trauma memories and responses were more likely due to an adaptive response becoming blocked, and or impaired. Symptoms could therefore be resolved by facilitating processing of the trauma towards adaptation or resolution.

Shapiro (1995; 2001; 2007) summarized her findings by proposing the adaptive information processing model which has three foundational principles. Firstly, humans exhibit an intrinsic information processing capacity that is able to restructure an initial maladaptive state of incoherence to an adaptive state of coherence. Secondly exposure to trauma and or persistent stress during early life can disturb, limit and disorder the development of this information processing capacity. Thirdly, the application of EMDR techniques and procedures restores coherence and integrity to the adaptive information processing capacity and capability. Adaptive learning and resolution is restored. EMDR therapy is effective because techniques engage trauma memories directly and resolve trauma symptoms by changing the way in which memory is stored in the information processing capacity of the nervous system and brain.

2.3.3 Limitations of CBT and EMDR

CBT and EMDR as approaches to the treatment of PTSD have similar and different limitations identified in the clinical literature and practice domains. Both approaches are mechanistic. Both approaches focus on symptom expression and not the personal experience of symptoms. The client is viewed as if they were a defective machine requiring fixing or servicing. The client's identity as a whole person is ignored (De Jongh et al., 2024; Gaudiano, 2008; Hayes et al., 2023; Novo Navarro et al., 2018). Founder of humanistic psychology Carl Rogers strongly believed for therapy to be effective it must focus on the internal landscape and include the experiential aspect of the client's lived experience (Yao & Kabir, 2023). CBT and EMDR are not technically person centered or client led in the Rogerian sense (Josefowitz & Myran, 2005; Shapiro, 2014; Yao & Kabir, 2023). CBT and EMDR are limited as a treatment approach for PTSD due to their primary focus being on symptom removal rather than on the client or person who is experiencing symptoms as part of their larger identity, story and in the context of their life.

The suitability of CBT for treatment of PTSD is a continued and ongoing focus of research. Gaudiano (2008) identifies three main criticisms of CBT which has implications for the treatment of PTSD. Firstly the cognitive element of CBT is not sufficiently stronger therapeutically when compared to implementing behavioral therapy alone. Secondly research has been unable to demonstrate a sufficient integration with cognitive and neuropsychology findings.

Thirdly, CBT research has not sufficiently elucidated, expounded or identified the precise mechanism of action when experiments have not yielded expected results. Since 2008, Burbank et al. (2024) have been able to address Gaudiano's second and third criticisms to some degree by examining treatment efficacy in relation to the specific condition of PTSD however Gaudiano's criticisms remain unaddressed outside this focus. The CBT mechanism responsible for positive treatment outcomes in the case of PTSD remains obscure.

Guy-Evans (2023) and Cuijpers et al. (2020) agree EMDR is demonstrably effective in treating PTSD however they also observed the mechanism responsible remains unclear. Cuijpers et al. (2020) commented despite widespread enthusiasm for EMDR there is a lack of comprehensive meta-analysis of randomized trials investigating the effects of EMDR on PTSD. These authors conducted a systematic review and meta-analysis of 76 trials and found indications that EMDR is effective in the short term for treatment of PTSD however the quality of studies was insufficient to be conclusive. Guy-Evans (2023) and Leonard (2019) observed EMDR carries the risk of the following potential side effects; feeling uncomfortable, feeling emotionally sensitive, emergence of new trauma memories, eliciting intense emotions, physical sensations and vivid dreams. Further research investigating the efficacy of EMDR for PTSD treatment is needed to identify those components necessary for a positive treatment response.

2.4 The New Paradigm of Quantum Medicine

Quantum physicist Amit Goswami (2011) proposed integral medicine as the needed evolution of the mainstream approach to medicine. The accepted approach to healthcare sees the body as a type of machine and the presence of symptoms indicate a need for repair due to damage and or malfunction. He argued for updating mainstream healthcare by replacing the fallacies of classical world view derived from deterministic Newtonian physics with a quantum physics understanding where consciousness is considered the foundational causal element determining the overall state of health. Goswami (2011) argued for the primacy of consciousness. He said, "Consciousness comes first; it is the ground of all being. Everything else, including matter, is a possibility of consciousness. And consciousness chooses out of these experiences all the events we experience" (Goswami, 2011, p. 3). The paradigm of quantum medicine indicated good health and complete recovery as a goal not only the only the removal, management or reduction of symptoms.

Goswami (2011) distinguished between upward and downward causation as different explanations for the emergent phenomenon of the material universe. Upward causation attributed the phenomenon of matter to the aggregation of elementary particles that progressively develop in to more complex structures. These processes detail much of the observed universe and are described exactly by the laws of Newtonian physics however they do not explain the origins of matter itself.

Downward causation, by comparison, attributes the emergence of the material universe to quantum phenomenon such as the wave function collapse, discontinuity, non locality and tangled hierarchy (Goswami, 2011). Goswami (2011) proposed quantum phenomenon are not separate from consciousness. They describe the movement and action of consciousness.

Goswami (2011) distinguished between ordinary and non ordinary states of consciousness. He proposed matter emerged following the wave function collapse, that is taking a measurement, making a choice and or an observation. He stated “consciousness splits itself into what we experience as subject object awareness” (Goswami, 2011, p. 65). The perceived object moves from a potential state in superposition to an observable object made from matter. The wave function collapse creates an illusion of separation where the subject perceives itself to be separate from the object. The subject is also able to perceive the material universe. Goswami (2011) argued that healthcare should be guided by a paradigm grounded in quantum physics as this approach provides a more complete account of the observable universe.

2.4.1 Quantum Collapse

Any incorporation of quantum theory in to a contemporary healthcare approach must integrate the phenomenon of quantum collapse which emphasizes the role of the observer in precipitating the material universe (Meijer, 2014; Wheeler, 1994). Goswami (2011, p. 62), in accordance with Wheeler’s notion of the participatory universe observing itself, resolved this dilemma by commenting “in the realm of possibility the electron is not separate from consciousness”. Quantum medicine as an approach to healthcare treatment and provision can be defined in terms of the process by which a quantum object moves from a wave state of potential to an actual state of matter, that is a material object. The object moving from a state of potential to a state of matter occurs as a function of being observed or measured (Faye, 2024). These ideas emerged following the findings of the famous double slit experiment that was first conducted in 1801 by Thomas Young (Parry-Hill & Davidson, n.d.; Young, 1804). Young (1804) used the double slit experiment design to demonstrate that light acts like a wave. Subsequently Heinrich Hertz discovered the photoelectric effect in 1887 which demonstrated that light also behaves like a particle (Buchwald, 2011; Editors of Encyclopedia Britannia, 2024). Bohr (1913) introduced further perplexing detail regarding the nature of the material world with his proposed model of the atom. He suggested electrons are particles that exhibit two styles of motion; that being continuous and discontinuous motion. Electrons either move continuously around the nucleus of the atom in a stable orbit or jump discontinuously between orbital planes.

The phenomenon of discontinuous movement of an electron around the nucleus of the atom sparked research interest that culminated in the development of the branch of physics known as quantum mechanics (Faye, 2024). Newtonian physics meaningfully, predictably and accurately describes the mechanics of the classical material world but does not as easily

apply when comprehending and describing the mechanics of the very small, that is the quantum universe (Goswami, 2011; Mindell, 2000). Newtonian physics cannot precisely locate the electron that moves discontinuously and jumps from one orbital plane to another. The electron appears to disappear and then reappear in a different orbital plane. Heisenberg's uncertainty principle summarized the difficulty of precisely locating electrons comprising quantum systems. "There is no way yet thought of for measuring the details of the path of an electron without totally disturbing its appearance" (Mindell, 2000, p. 206). Feynman's explorations of the double slit experiments demonstrated the position and momentum of the electron cannot be determined with certainty or conversely uncertainty cannot be disproved (Feynman et al., 1965). Goswami (2011) illustrated the phenomenon of the observer in the quantum universe by describing the imagined example of an electron being released in a room. The electron's wave of possibility spreads out in potentia or is in superposition throughout the room as long as it is not looked at or observed. The electron is and is not everywhere and anywhere until it is observed at which point all possibilities for the electron reduce to just one. Goswami (2011) referred to this discontinuous movement of the electron as a quantum leap or a quantum collapse.

The Copenhagen interpretation of quantum mechanics collectively developed by Neils Bohr, Werner Heisenberg, Erwin Schrödinger and other physicists in the 1920s proposed the idea that a quantum system can exist in multiple possible states at once, that is in a state of superposition. Superposition is defined as an undifferentiated potential state where quantum systems can exist until an observation is made or a measurement is taken (Lu et al., 2023). The thought experiment known as the Schrödinger's cat paradox is a popular illustration of the concept of superposition (Schrödinger, 1935). Von Neumann (1955) later developed a clearer mathematical formulation that incorporated superposition into the emerging quantum theory. Von Neumann (1955, cited in Goswami, 2011) proposed quantum objects are possibility waves in superposition that develop in time in two different ways. Continuous movement of a quantum object between observations or measurements is where possibility waves spread out continuously. Conversely, discontinuous movement occurs when the quantum object is observed that is when a quantum measurement is made. The quantum object changes from spreading out as a wave to localized particle by the act of taking an observation or measurement.

2.4.2 Quantum Entanglement

Quantum theory proposes particles are connected throughout the universe in an unexpected way. They are entangled such that if one particle is influenced in a particular way, the entangled particle will also respond instantly in the same way. Quantum entanglement, also known as non locality, was described by Albert Einstein in a letter to Max Born in 1947 as "spooky action at a distance" (Einstein & Born, 1971, pp. 157–158). "Quantum entanglement refers to the way particles or molecules that arise from the same source, or are part of the same quantum system, connect with one

another without any visible signal exchange" (Mindell, 2010, p. 84). Einstein et al. (1935) in an attempt to disprove quantum theory showed a simple interaction between two quantum objects established a connection sufficient to combine both in to a non local whole. These authors demonstrated that the quantum collapse of one quantum object or wave of possibility in one part of the quantum system instantly results in the quantum collapse of the rest of the system (Goswami, 2011). This means "the wave function does not provide a complete description of the physical reality" (Einstein et al., 1935, p. 780). The quantum entanglement or non local connection between the two quantum objects lies outside space and time.

Alternate explanations of quantum entanglement were not forthcoming. Bell's theorem proposed if quantum entanglement is correct then entangled particles exhibit correlations that cannot be explained by classical physics or unknown concealed covariables (Bell, 1964). Aspect et al. (1982) tested the predictions made by Bell's theorem. Entangled photons were passed through polarizers set to different angles and polarization correlations of the two photons were measured. The findings indicated the correlations between polarization measures of the entangled photon pairs failed to meet predictions of Bell's inequalities by a significant margin. These findings demonstrate the phenomenon of non locality because the correlated quantum objects were found to be influencing each other without any signal exchange (Aspect et al., 1982; Goswami, 1993; 2011). These findings do not, however, reveal the anatomy or demonstrate the mechanism by which quantum entanglement or non-locality occurs. Goswami (1993; 2011), Mindell (2000; 2010) and Wheeler (1994), among others, suggest consciousness itself as the mechanism underlying the phenomenon of quantum entanglement.

Mini wormholes or super small blackholes at the scale of the proton were proposed by Haramein (2010) as a possible mechanism by which quantum entanglement occurs. Haramein (2010) demonstrated the proton has sufficient force and energy, derived from quantum fluctuations, to generate a super small blackhole. Haramein (2013a) incorporated and developed the holographic principle, in a general sense, further by applying it to examine the similarities between a proton and a blackhole thereby further extending previous theoretical work with the holographic principle. 't Hooft (1993) proposed the holographic principle as a property of quantum gravity such that information describing a volume of space can be encoded on a lower dimensional boundary condition such as an event horizon. Previously, Bekenstein (1973) described the entropy of a black hole as being proportional to its surface area, rather than its volume. Subsequently, Susskind (1995) developed the holographic principle further by proposing the entropy of ordinary mass, in addition to black holes, is proportional to surface area and not volume. He suggested volume is a kind of illusion and the universe is more like a hologram indicative of the information imprinted on its two dimensional surface boundary. The holographic principle

enabled meaningful investigation in to the potential mechanism by which quantum entanglement occurred.

Haramein (2013a) described holographic gravitational mass in terms of planck spherical units distributed across the surface area of the proton horizon. He suggested they appear as a circle in a two dimensional plane. He proposed the internal volume of the proton relates to its surface geometry such that one planck spherical unit holographically expresses all energy and or information with which it is entangled. He found the value of quantum fluctuations present on the circular surface of the proton divided by the volume of the proton is equivalent to the current estimate of the total particles comprising the universe. Furthermore, Haramein (2013a) also derived an extremely accurate measurement of the radius of a proton. Haramein (2013a; 2013b) applied his conceptualization of holographic gravitational mass mathematically to investigate the relationship between the proton's charge radius and mass. His results regarding the proton's radius differed from the standard model by 4% but were within one standard deviation of the contemporaneously accepted value. Subsequently his results were validated through experiments performed at the Paul Scherrer Institute (Haramein, n.d.; 2013b). Haramein proposed every single planck circle at the proton surface can be understood as a mini wormhole internally connecting it with another proton. Haramein's (n.d.; 2010; 2013a; 2013b) research efforts are yet to receive mainstream acceptance by the scientific community. Despite this, his work illustrates the mechanism by which quantum entanglement occurs could be mini wormholes networked with all other protons in the universe.

2.4.3 Quantum Fields

Supporters of quantum field theory have proposed that fields and not particles make up the fundamental nature of the universe (Ash, 2020; PBS Space Time, 2017). Fields are a naturally occurring phenomenon that organize and give structure to a particular sphere (Mindell, 2000; 2012). The gravitational, magnetic and electrodynamic fields are examples established by classical physics that describe the action of the forces of gravity, magnetism and electricity respectively (Baird, 2023; Center for Nondestructive Evaluation, n.d.). The effect of a force on a field can be observed as in the case of magnetism where the field effects of the magnetic force are made visible by covering a magnet with a sheet of paper and sprinkling iron filings on the surface of the paper. The magnetic field exerts an invisible force emerging from the poles of the magnet through the space around the magnet. The force is strongest near the magnet and weakest further away from the magnet. The iron filings are attracted and organized by the magnetic field. The lines and direction of the magnetic force can be observed in the arrangement patterns on the paper (Baird, 2023). Quantum field theory similarly suggests the presence and influence of an ordering and organizing force on a quantum field.

Quantum field theory is a framework that combines classical field theory, special relativity and quantum mechanics. It became the

theoretical foundation for the standard model of particle physics (Conseil Européen pour la Recherche Nucléaire [CERN], n.d.; Kuhlmann, 2023). The standard model of physics is not a unified theory because it does not incorporate all four of the fundamental physical forces and their associated fields (CERN, n.d.). The mathematical definition of a field is a function that assigns a value to each point in space and time (Mindell, 2000; 2012). Heisenberg's uncertainty principle demonstrated mathematically that quantum fields cannot be at rest, are constantly moving and changing their value over time (Goswami, 2013; Mindell, 2000; 2012). Quantum field theory proposed "elementary particles as vibrational nodes in fundamental fields that exist at all points in space and time through the universe" (PBS Space Time, 2017, 1:19). Subatomic particles, such as electrons and quarks, within quantum field theory are conceptualized as excitations, vibrations or oscillations of a field phenomenon rather than as discreet material particles (Lincoln, 2016; The Piggs Boson, 2023).

Ash (2020) described quantum fields, incorporating the wave function collapse, as being fluid like substances that exhibit perturbations. They are present in the vacuum of space that is not empty but contains elementary particles that are constantly being created and destroyed (Goswami, 1993). Both quantum physicists Goswami (1993; 2008; 2011; 2013; 2014) and Mindell (2000; 2010; 2012; 2013) have proposed consciousness itself as being the invisible force that organizes and structures quantum fields.

2.4.3.1 Consciousness. Goswami stated "consciousness, not matter, is the ground of all being" (Goswami, 1993, p. 1) because "everything, including matter, is made of consciousness (Goswami, 2008, p. 60). He suggested the dual properties of light and the wave function collapse occurred due to consciousness making a choice (Goswami, 1993; 2024). Goswami (2024) referred to this phenomenon as the observer effect. Von Neumann (1955) proposed a thought experiment to illustrate the role of consciousness, more specifically the observer effect, in the Copenhagen interpretation of the double slit experiment (Goswami, 1993; PBS Space Time, 2020). He proposed a chain of information develops in superposition following the potential movement of the electron as it passes through the slit, registered on the detection device, is interpreted by the measurement device and is ultimately perceived by the mind brain system of an observer. Von Neumann (1955) suggested that the chain of information continued indefinitely in superposition until an observer outside the chain made an observation. He believed the wave function collapse occurred at the moment awareness of the experiment result became conscious (PBS Space Time, 2020). Von Neumann (1955) interpreted the information chain thought experiment as evidence of consciousness being a nonlocal phenomenon acting external to the material universe.

Wigner (1961) developed the role of the observer further with another thought experiment known as 'Wigner's friend' (New Mind, 2019; PBS Space Time, 2020). Wigner

proposed a scenario where his friend conducted a quantum experiment in another laboratory, that is his friend made a quantum measurement of a physical system in another place. Both Wigner and his friend were aware of the experiment however Wigner's friend observed the outcome of the experiment before Wigner was aware of the outcome. Wigner's friend then communicated the experiment results to Wigner. The thought experiment highlighted the role of the observer noticing or measuring different outcomes and at different times in so far as prior to communicating the experiment results to Wigner, his friend and the experiment outcome are in superposition. The Wigner's friend thought experiment challenged the veracity of the assumptions necessary to the scientific enterprise regarding objectivity, facts, observations and consensus or generally agreed upon reality. Proietti et al. (2019) conducted an experimental test of Wigner's friend thought experiment. These authors found that experimental outcomes were in fact observer dependent. This finding provided support for the role of consciousness, that is the role of the observer or many observers, in precipitating the material universe.

2.4.3.1.1 Awareness. Goswami (1993) proposed awareness as the aspect of consciousness necessary to make a quantum measurement that is to collapse the wave function. He defined awareness as "the space of the mind in relation to which objects of consciousness, such as thoughts, can be distinguished; analogous to physical space in which material objects move" (Goswami, 1993, p. 275). He (1993) defined consciousness in terms of four components; a field, objects, a subject and the foundation. Goswami (1993) referred to the field of consciousness or mind field as awareness. Objects of consciousness, thoughts and feelings, emerge and move through this field. He suggested the subject of consciousness was the witness, observer or experiencer. Lastly and as stated previously, he proposed that consciousness itself is the foundation of all being. Goswami (1993) distinguished between conscious and unconscious awareness. He suggested conscious awareness was necessary to make a choice or quantum measurement and precipitate the wave function collapse.

Goswami (1993) further differentiated awareness from perception. He observed awareness is entwined with conscious but not unconscious perception. He suggested it is possible to perceive or observe something unconsciously without making a quantum measurement and that conscious awareness was necessary for wave function collapse. Goswami (1993) postulated that the mind brain system uniquely evolved as both a quantum measurement apparatus and as a perceptual bridge between the classical and quantum universe. Goswami (1993) proposed the mind brain system performed a quantum measurement due to a tangled hierarchy, that is "a hierarchy that cannot be causally traced without encountering a discontinuity" (Goswami, 1993, p. 283). Tangled hierarchy gives rise to self awareness, consciousness of the self or the function of consciousness and agency referred to in everyday speech as 'I' where the self is defined as "the subject of

consciousness" (Goswami, 1993, p. 283). Awareness is a function of consciousness distinct from but entangled with perception and functions of perception.

Two kinds of awareness, primary and secondary, are indicated by the concept of a tangled hierarchy. Primary awareness, as proposed by Goswami (1993), is that awareness which is present initially that is prior to the precipitation of the object subject split. Goswami (1993) called this the quantum self and he defined it as "the primary subject modality of the self beyond the ego in which resides real freedom, creativity and nonlocality of the human experience" (Goswami, 1993, p. 282). He suggested secondary awareness, attributable to the sense of 'I', emerged as a consequence of self awareness, reflection and introspection. Goswami (1993) referred to this subject as the classical self which he designated as a limited individual self resulting from behavioral learning principles that is, a collection of conditioned responses.

Tangled hierarchy is the mechanism by which primary and secondary awareness precipitate a coherent sense of 'I', the material world and an ongoing movement of consciousness between the classical and quantum universe.

2.4.3.3.2 Memory. Memory is a function of consciousness that exhibits qualities and traits similar to that of a field (Budson et al., 2022; Sheldrake, 2009; 2011). Sheldrake (1981; 2009; 2011) observed memory is inherent in nature and is necessary for morphogenesis, that is the development of biological form. Since the 1920s, biologists have assumed morphogenetic fields guide the development of organisms but have not been able to specify the mechanisms involved (Sheldrake, 2013). Sheldrake (2011) considered the mechanics or laws of nature were more accurately conceptualized as habits and an indication of memory, that is a record of the past. He proposed all plants and animals inherit, engage with and contribute to a collective memory of their species in the course of being alive in physical form. He called this collective memory morphic resonance which he suggested was a kind of vibrational residue of past forms that remain, hypothetically, imprinted invisibly on a field (Sheldrake, 1981; 2011). Sheldrake (1981) combined the ideas of morphogenetic fields and morphic resonance into the hypothesis of formative causation which says "… morphic resonance occurs between such rhythmic structures of activity on the basis of similarity, and through this resonance past patterns of activity influence the fields of subsequent similar systems. Morphic resonance involves a kind of action at a distance in both space and time" (Sheldrake, 2011, p. 182). Morphic fields are influenced by morphic resonance and "play a causal role in the development and maintenance of the forms of systems at all levels of complexity" (Sheldrake, 2009, p. 93).

The nature of memory is consistent with the influence of morphic resonance on a personal or collective morphic field because memory can be personal or collective. Individuals are influenced by morphic resonance from their own past, that is personal memories, in addition to their species' past, that is collective memories (Sheldrake, 2011). Personal memories do not

appear to have a single physiological mechanism or physical trace (Sheldrake, 2011). Damage to the brain in both human and animal subjects does not prevent personal memory from being accessed and employed (Sheldrake, 2011). Consistent with morphic resonance, personal memories are grouped around patterns of sameness that is what is significant, meaningful, familiar and similar (Sheldrake, 2011). Collective morphic resonance is similar to Jung's (1959b) concept of the collective unconscious which he suggested does not develop individually but is inherited collectively. Jung (1959b) called the inherited collective unconscious of pre-existing forms archetypes. He suggested these universal patterns accumulated in the collective unconscious across generations of human lives and serve a guidance function for human beings as they progress through the various learning and developmental stages over the span of a human life. Sheldrake (2011) conducted experiments on both animals and human populations that investigated the impact of morphic resonance on collective memory. He found an inverse relationship between time taken for new learning and number of skilled learners. The time taken to learn a new skill reduced as the number of skillful learners increased thereby providing confirmation of the phenomenon of morphic resonance. Morphic resonance can be considered as a kind of memory field.

Sheldrake (2009) also observed the similarity between morphic and quantum fields. He suggested the influence of morphic resonance on morphogenetic fields may be tangled, entangled and non local (Sheldrake, 2009; 2011). He further suggested morphic resonance cannot be precisely located only described in terms of spatial probability. Morphic fields provide a parsimonious explanation for normal biological development and regeneration (Sheldrake, 2009). They are intrinsically holistic or fractal as they cannot be divided into component parts. Sheldrake's (1981) hypothesis of causative formation and his subsequent research findings have provided some support for the contention that memory or morphic resonance and morphic fields guide, develop and organize morphogenesis in the physical universe.

2.4.3.1.3 Perception. Perception is the function of consciousness necessary for the observer effect to collapse the wave function or make a quantum measurement. The standard approach to modelling perception is mechanistic in nature (Cherry, 2024). The American Psychological Association defines perception as "the process or result of becoming aware of objects, relationships, and events by means of the senses, which includes such activities as recognizing, observing, and discriminating. These activities enable living beings to organize and interpret the stimuli received into meaningful knowledge and to act in a coordinated manner" (American Psychological Association, 2018, para. 1). Living beings gain information about their environment through the sense channels including touch, sight, sound, smell, taste and proprioception that is the sense that detects changes in body position and movement. The senses pick up an array of information, much of which is not relevant to the need of the moment,

so perception evolved together with cognition to select in and focus on relevant information and screen out and ignore irrelevant or unnecessary information (Cherry, 2024; Shi, 2021).
Relevance of perceived information is determined by intention among other demands of survival.

Perception is a process that can be understood in terms of stages. Cherry (2024) described the process of seeing or visual perception as comprising of eight steps. Firstly, environmental stimulus is encountered. Secondly, attention is focused on the stimulus. Thirdly, light is passed through cornea and pupil on to the eye lens. The cornea and lens projects an inverted image on to the retina. Fourthly, transduction converts the image in to electrical signals and these are transmitted to the brain. Fifthly, electrical signals are processed by the brain. Sixthly, the stimulus object is able to be consciously perceived. Seventhly, the stimulus object has been identified accurately and meaningfully by the application of cognitive process including perception of pattern recognition and matched with memory. Lastly the perception process initiated some mobilization of activity in response to the stimulus. This model of perception proposes the brain co ordinates sensory stimulus information to represent both the object encountered and the body sensations, proportions and locations involved in perception (Costall, 1984). This model is called the representational theory of perception and it is assumed that artefacts of perception reside in the brain.

Several researchers have identified difficulties with the representational theory of perception (Dicker, 2011; Goswami, 2008; Locatelli & Wilson, 2017; Sheldrake, 2013). Goswami (2008) criticized the representational model in the following way. Perception as experienced by the observer is unified, ordered and co ordinated however brain imaging during the process of observing an external object does not exhibit similarly patterned neuronal excitatory responses. Brain activity patterns are constantly reorganizing and changing even when patterns of activity are observed in response to smells (Sheldrake, 2013). Brain imaging shows neuronal activities of many disparate regions of the brain not just those areas of the brain representing particular senses or body regions (Dispenza, 2008; Goswami, 2008). The mechanism by which the brain integrates the firing and stimulation of various nerves and neuronal pathways into the perception of a unified whole is not known (Dispenza, 2008). The amygdala, located in the medial temporal lobe, has been found to be instrumental in accessing emotional memories and the perception of situations based on strong memories such as threat identification however no associated specific region of nerve cells storing memories have been identified (Dispenza, 2008). The brain is also able to change, adapt and reorganize its own functioning to compensate for sensory loss by bolstering the function of the senses that are intact. The visual cortex in the case of a blind person, for example, can be re operationalized to process sound information (Dispenza, 2008).

Perception is influenced and guided by memory or previous knowledge of the world.

Researchers demonstrated this attribute of perception by asking participants to categorize hues on a yellow to orange continuum (Mitterer et al., 2009). Participants were more likely to give a response of yellow if an ambiguous hue of yellow was presented on a stimulus object that was typically yellow (Mitterer et al., 2009). Perception is built from memory and memory directs perception. They are entangled (Goswami & Onisor, 2021). The difficulty specifying the physical representation of perception at the level of neuron response, brain plasticity and the role of memory in perception suggest the representation theory of perception is not, as yet, a complete account of the way in which perception works.

Sheldrake (2009; 2011; 2013) departed from the representation theory and proposed instead that perception is a field phenomenon that works through the brain but is not located in the brain. Sheldrake (2013) suggested that perception or vision is a two way process that occurs in the presence of a field. He suggested vision required an inward movement of light and an outward projection of image that is experienced consciously. This proposition differs from the representational model of perception which identifies only one stage, that being light moves in to the perceptual apparatus of the brain which interprets the information and constructs a representational image (Gomez-Marin & Sheldrake, 2023). Sheldrake (2013) suggested perception is the result of images being projected outwards in a mental field that moves through the brain but is not confined by it. The perceived images are located in the mind field rather than being represented in the brain. The mind perceives through the brain, projects images outwards within a mental or a perceptual field. Sheldrake used these terms interchangeably. Sheldrake (2011) proposed a perceptual field as being a special kind of morphic field.

Sheldrake (2013) proposed mental/perceptual fields as a parsimonious explanation for perceptual phenomenon such as telepathy, human/animal premonition and scopaesthesia or the sense of being stared at. Sheldrake and Smart (2023) reviewed 960 scopaesthesia case histories taken from interviews with individuals likely to encounter meaningful instances of both staring at and being stared at in the course of their employment. The occupations of participants included roles such as surveillance officers, detectives, martial arts teachers, celebrity photographers, wildlife photographers and hunters. These authors concluded that field interactions and directionality was a normal feature of scopaesthesia in real life scenarios. They further interpret these findings to indicate that minds do extend beyond brains due to an undetermined kind of visual extramission projected outward during the process of seeing, looking, watching, observing, giving focus and or attention.

2.4.3.1.4 Attention. Attention is the aspect of consciousness, specifically a quality of perception, necessary for the observer effect to occur. Attention can be active or passive, that is, conscious or unconscious (Goswami, 1993). Attention can be conscious and meaningful if there is an intention providing focus and or a choice is being made. Alternatively, attention

can be unconscious where it is solely an expression of habit. Goswami and Onisor (2021) proposed attention is organised by that which is meaningful and or the presence of strong emotion. Goswami and Onisor (2021) observed a distinction between active attention and passive awareness. They found when attention is actively focused, the movement of consciousness that occurs is in line with personal choice however when attention is passively aware the movement of consciousness is habitual or based on probabilities. These authors suggested pathologies of attention such as attention deficit and hyperactivity disorder (ADHD) develop as a consequence of a reduction in cultural meaning. Similarly, Maté (2019) attributed the etiology of ADHD to a reversible developmental delay originating in infancy due to generational family stress and disturbed social conditions. Attention as a function of consciousness has a potential ordering or disordering influence depending on the associated level of awareness and meaning. Altered states of consciousness have different qualities of focus and or attention. There is a kind of attention and focus in a dream however it is difficult to consciously control within a dream state (Mindell, 2002a; 2002b; 2007). Mindell (2012) described attention as having two qualities; primary and secondary that are engaged in a constant dynamic exchange. He proposed primary attention as being perceived everyday social experiences, consensual events, time and space. He suggested the secondary attention was perceptions of socially marginalized experiences such as feelings and or intuitions. Primary attention is associated with the perception of consensus reality, that is the generally agreed upon objects, perceptions and meanings. It gives rise to the personal identity or the primary process as described by Mindell (2012). Mindell (2012) suggested the secondary attention perceives non consensus reality, that is, perceptions and experiences that are unique to the individual and not shared with others. The secondary attention included the imagination, dreaming, altered states of consciousness, body symptoms and the Dreamtime of the Australian Aborigines among other indigenous groups. Mindell (2012) proposed primary and secondary attention is divided by an edge that separates the field of consciousness in to the personal or “I” and the not personal or not “I”. Learning to move consciously in to the secondary attention is one of the keys to transforming physical and psychological symptoms (Mindell, 2007; 2010; 2014d). The dual nature of attention enables consciousness to engage in a self reflective process which gives rise to the observer effect.

2.4.4 Quantum Creativity and Healing

Healing or being healed happens as a consequence of quantum creativity or a special form of quantum collapse that occurs when the observer sees again with new understanding. Goswami (2011) proposed the human body is made from five bodies; the physical, vital, mental, supramental and bliss bodies that carry information encasing one another in layers of increasing density. He attributed the morphogenetic field and form making blueprints to the vital body. He proposed the mental body as the repository of the knowledge, information and understandings providing context, meaning and mental representations to the physical and

vital bodies. Spiritual experiences and Plato's archetypes, Goswami (2011) proposed as the terrain of the supramental body. Lastly, he suggested the bliss body as the ground of all being that is consciousness itself. He suggested consciousness moves from less to more dense forms and that diseased states develop as a consequence of habitual obstructions, deviations or distortions in the flow of consciousness, that is life force, as it follows a movement of downward causation (Goswami, 2011; 2014). Healing, according to Goswami (2014), occurs when the flow of consciousness between the subtle energy bodies is restored.

Healing with quantum creativity requires the development or discovery of new meaning or new interpretation of a situation that is being perceived and understood from a place of habit. Goswami (2014) suggested creativity follows a process of four stages. These are preparation, incubation, sudden insight and manifestation. Preparation involves gathering facts and existing ideas about the situation in question, seeking expert opinions on the problem, turning the problem over and over, being curious about the problem, reflecting, thinking, planning and imagining. Incubation involves putting the problem on the back burner, percolating in the background, relaxing, playing and even sleeping but not focusing directly on solving the problem. Sudden insight involved the receipt of an unexpected idea, understanding, solution and or resolution of the problem. This stage signaled the moment of discontinuity, the needed quantum collapse, where a new way of seeing and perceiving what has happened through a burst of unexpected insight and or inspiration. Manifestation is the last stage in the process of creativity where concrete steps are taken to integrate the sudden insight in to material form by taking some action. The process of dreaming, both awake and asleep, are an example of this creative process happening as an ordinary aspect of existence (Goswami, 2011; 2014). Both Mindell (2010; 2012) and Goswami (2011; 2014) described human existence as an ongoing process of dreaming, an exchange between consciousness and unconsciousness, self and other, familiar and new, classical ego and quantum self. Quantum creativity and healing happens as a natural consequence of perceptions, observations, comprehensions, movements, interactions and exchanges in the field of consciousness.

2.5 The Self

Mindell (2010; 2012) conceptualized the self as an ongoing awareness process that incorporated aspects of Goswami's (1993; 2011) formulations of the self. Mindell (2010; 2012) believed the self was generated from the dynamism and momentum of an awareness process resulting from the interaction and exchange between two qualities of attention, that is first and second attention. Awareness that was centrally focused on the foreground that was largely derived from the first attention, he called the primary process, while awareness of elements occurring on the margins or the periphery he referred to as the secondary process, that is the domain of the second attention. The self was comprised of both the primary, those elements an individual identifies with consciously, and the secondary process,

those aspects of experience with which an individual does not identify. Mindell's (2012) notion of primary and secondary process is at a slight discord with Goswami's (1993) conceptualization of primary and secondary awareness. Mindell's sense of primary process, in general terms, encompasses and is entangled with Goswami's (1993) description of secondary awareness. Both authors agreed on the role awareness has in the mind brain system to collapse the wave function and in the manner of the chicken and egg tangled hierarchy splits consciousness in to two components. Mindell (2010) suggested consciousness is divided in to what he called the everyday and process mind, where as Goswami (1993; 2011) proposed the classical and quantum self. Awareness of the movement of information in the field of consciousness is foundational to the self reflection and developmental capacity of the self.

2.5.1 Authentic Self

The authentic self can be considered as a coherent system of awareness and attention that moves fluidly between Goswami's (1993; 2011) classical and quantum self. The authentic self is typically denoted in the therapeutic body of research as being a truthful and congruent expression of an individual's personhood that is free from deceit, concealing, repression, limitation and distortion of the person and their potential (Al-Khouja et al., 2022; Guenther et al., 2023).

Authenticity has been defined in general terms as being true to oneself (Jongman-Sereno & Leary, 2018; Sedikides et al., 2019). This sense of authenticity emerged in the ancient world through examining what constitutes goodness and virtue. Aristotle suggested the highest good is a full life lived in accordance with the best and most complete expression of virtue (Vinje, 2022). Although Nietzsche does not use the word authenticity specifically, he suggested the true version of the self is something to strive towards and can be identified by following that which is loved (Nietzsche, 1874). Maslow (1971) conceptualized being authentic as giving spontaneous expression to the self by acting and living in a way that accurately reflects the characteristics and desires of an individual. Conversely, being inauthentic can be defined as acting in ways that are not real or indicative of an individual's true self (Guenther et al., 2023). The authentic self has an actual and potential state that emerges and is expressed moment by moment mirroring the movement of consciousness between the classical and quantum self.

The authentic self has the potential to develop more fully across the lifespan. Maslow's (1943) hierarchy of needs outlined a five stage developmental process of human potential across a lifetime that moves progressively toward more authenticity as the individual learns, develops and changes. Maslow (1943) proposed the last stage of self actualization, where an individual has reached and fulfilled their full potential, as the pinnacle of human development and achievement. Authenticity, that is the pursuit of authenticity and the development of the authentic self, is necessary for self actualization (Bauer, 2021; Maslow, 1943). Congruence between an individual's

inner world, that is their beliefs, values, attitudes, opinions, feelings, emotions and thoughts, and their outward expression is necessary for the emergence of the authentic self (Kernis & Goldman, 2006; Rogers, 1957; Van den Bosch & Taris, 2013). Erickson (1995) proposed the state of authenticity emerged when an individual is able to maintain their personal values in ambiguous situations. The findings of these authors indicate authenticity or the authentic self can be defined in terms of an enduring aware internal sense of coherence.

Authenticity can be considered both a therapeutic technique and therapeutic goal as the pursuit of authenticity has been found to facilitate health and healing. Rogers' (1957) person centered approach to the therapeutic endeavor was founded on authenticity. Lambert and Barley (2001) reviewed research investigating the interaction between the therapeutic relationship and psychotherapy outcomes. These authors found congruence within the therapy experience that is between and individual and their therapist and within the therapist individually was a necessary pre condition for positive change to occur. Kifer et al. (2013) examined the relationships between social power, authenticity and subjective well being. These authors found that the association between increased power and improved well being was mediated by authenticity. Heppner et al. (2008) found state authenticity to be positively associated with daily reports of self esteem and was also associated with positive self perception. Sutton (2020) conducted a meta analysis examining the impact authenticity had on well being and engagement at work. She found authenticity had a positive impact on both elements. The state of authenticity represents a robust form of the self where aspects of positive and negative experience have been integrated in to a coherent whole sense of self grounded and founded on a what is real and truthful.

2.5.2 Traumatized Self

The traumatized self constitutes a departure from the authentic self in a prescriptive way depending on the extent of the exposure to trauma and at what stage of development the exposure occurred. Trauma, in general terms, is an experience where an individual encountered danger and or a threat to their safety where they were unable to protect themselves and as a result experienced harm. The American Psychological Association (n.d.) defines trauma in terms of an emotional response to a terrible event such as an accident, crime, natural disaster, physical or emotional abuse, neglect, experiencing or witnessing violence, war, death of a loved one among other distressing incidents. Exposure to trauma has an immediate and subsequent effect (APA, n.d.). Reactions of shock and denial are common in the short term, where as flashbacks, emotional outbursts, anger, anxiety and sometimes physical symptoms such as headaches or nausea develop subsequently. Exposure to trauma has caused an injury to the self and the nervous system (Kalsched, 1996; van der Kolk, 2014). Recovery from trauma has been found to be dependent on the extent of damage that has been sustained. The world appears different to the individual following exposure to trauma (Rothschild, 2000). Trust and safety within the

world has been destroyed for the individual concerned. The recovering self has the difficult task of incorporating the trauma in to their understanding of themselves, the world and their place in it whilst at the same time rebuilding their sense of safety both internally, in their body, and externally, in the world. Exposure to trauma prior to the completion of developmental stages has caused the developing self to be shattered and the traumatized self develops in place of what should have been (Kalsched, 1996). The traumatized self is a self divided against itself, maintained by dissociation and defined by the gaze of that which perpetrated the trauma.

2.5.2.1 Dissociation. Dissociation is the psychological defense process that enables the self to survive trauma, albeit it in a state of internal division and incoherence. The American Psychiatric Association defines dissociation as a disconnection between a person's thoughts, memories, feelings, actions and or sense of who they are (Spiegle, 2024). Dissociation is a normal process that everyone has experienced to some degree in the course of their everyday life. Daydreaming, being absorbed in to a book or movie and lapsing in to a reverie on a long drive among others, are all everyday examples of losing awareness of the immediate environment and surroundings. Rothschild (2000) described dissociation as a freeze response, a splitting of awareness. Dissociation in response to a traumatic event enabled an individual to cope with the threat to their survival by blocking the experience from their conscious awareness (Kalsched, 1996). Life can continue because dissociation has distributed the unbearable event to different, often unconscious compartments, of the mind and body (Rothschild, 2000). Lanius et al. (2004) investigated brain changes in subjects who had experienced early life trauma. They found severely reduced activation of the self sensing areas of the brain. The medial prefrontal cortex, the anterior cingulate, the parietal and the insula cortex did not show any signs of activation in subjects who had experienced early life trauma. The posterior cingulate, responsible for basic spatial orientation, showed indications of slight activation. Dissociation has both a psychological and physical consequence.

Dissociation ensures the survival of the body in the short term because the self strives to manage the trauma. This damage to the self is more pronounced when it happens to the developing psyche. Ordinary developmental processes progressively transform the original undifferentiated unity of the mother/infant dyad in to a sense of two, the self and the other (Kalsched, 1996). Winnicott (1953) proposed the good enough mother is able to provide a transitional relationship and sense of safety such that the subjective world of the infant's developing self can integrate with the objective world of consensus reality. Dissociation when used as a defensive manoeuvre by the developing self prevents aspects of consciousness, such as cognitive awareness, affect, sensation and images among others, from unifying and integrating in to one self (Kalsched, 1996).

Jung (1954) proposed dissociation generated

its own complex which he observed was not under the conscious control of the individual. This fragmentation of consciousness was referred to by Jung (1969; 1973) as splinter psyches or complexes. Jung (1973) proposed these splinters or complexes were tethered by qualities of emotion and could be considered little personalities within themselves, that is, they could act independently. These parts organize themselves around archetypal patterns instead of around the authentic self in an attempt to recover. The polarities of complexes generated a counterfeit integration through being connected and held together by archetypal narratives derived from the collective unconscious. This organization of the psyche mimics coherence but does not reach unity within the self. A false self is engineered and a disembodied mind emerges that is disconnected from trauma residue but also from aspects of consensus reality (Winnicott, 1949; 1960). The external experience of trauma has ceased but the internal experience is repeated continuously as the forces of integration are perpetually thwarted by the forces of dissociation.

2.5.2.2 Gaze of the Other. The self takes its definition and form from the way the self is being looked at, observed or seen by the internalized gaze of the one who provided care during early development. This process can be compromised in the case of exposure to early trauma where the fracturing that occurs due to trauma is maintained by the internalized gaze of the original perpetrator of the trauma. Freud (1914/2001; 1953/2001), the father of psychoanalysis, introduced the role of scopophila, that is looking and being looked at, in the development of the self. Psychoanalysis gave rise to object relations theory which described the emergence of consciousness, in the course of ordinary development of the human infant, through the action of instinctive desires and or drives on their associated objects. These objects were progressively associated with satisfying those desires and or drives and integrated (Greenberg & Mitchell, 1983). The maternal ministrations of the good enough mother in the infant-mother dyad was proposed as the developmental experience needed to provide sentient reflections to the self (Fink, 2007; Winnicott, 2005). The good enough mother does eventually fail to soothe or satisfy as the developmental needs of the individual become more complex and demands for independence grow.

The necessary failures of the good enough mother, under ordinary developmental conditions, provide the foundation for separation and seeing one's own self as a sentient object. The moment the infant sees their own reflection in the mirror, or the mirror stage as proposed by Lacan (2004), they are able to see themselves as a sentient individual that has integrated both subjective and objective experience (Evans, 1996; Lacan, 2004). Lacan (2004) proposed this experience satisfies by temporarily reconciling the internal chaos of conflicting desires and or drives with the image of wholeness. The infant's self is held together by their own gaze looking at themselves and knowing 'this is me' however the satisfaction of this recognition experience of self knowledge and unity is fleeting.

Eventually the developing infant must contend with the discomfort of existing in a state of fragmentation without the unifying gaze of the other (Evans, 1996). The infant can mitigate this threat in two ways; firstly by striving to become the desire of the one who is looking at them, that is the desire of the other, and secondly by internalizing the gaze of the other as an object so they are no longer dependent on the material presence of the other. Lacan (2004) referred to this process as 'the gaze of the other' (Evans, 1996). He proposed the desire of the other constellated, embodied and stabilized the self through the gaze (Evans, 1996; Lacan, 2004). The threat of fragmentation for the infant shares some similarities with the injury to the self that is indicative of trauma and is suggestive of the therapeutic potential of the gaze in the case of trauma.

2.5.2.3 Gaze as an Object. The gaze of the other internalized as an object can both unify, as in the case of childhood development, and fragment the self, as in the case of trauma. The gaze of the other as an object cannot be photographed because it does not exist in the real, the domain of consensus reality, but it can be imagined and therefore depicted in artistic form such as portraiture. A portrait is in a sense a depiction of the gaze of the other as an object. This is particularly true if the object of the portrait is looking out of the painting at the one observing. Both Freud (1957/2001) and Lacan (2004) analyzed art works, in particular the iconography used by Leonardo da Vinci in his paintings, in terms of their psychoanalytic purpose, process and meaning.

Leonardo da Vinci was well known for his skillful and realistic portraiture (Kempe & Gresham College, 2019; Kempe & The Aspen Institute, 2017). Leonardo da Vinci achieved these effects by relentless innovation, continuous refinement of his works and experimentation with painting and drawing techniques (Kempe & Gresham College, 2019). He developed his style and technical ability by studying all aspects of human anatomy including visual perception. He then applied his discoveries to his art to create realistic vibrant images of the human body and powerful visual illusions (Kempe & The Aspen Institute, 2017). Leonardo da Vinci also used his technical abilities in painting to convey the consciousness of person being depicted in his portraits. Kempe (2019) described Leonardo da Vinci's portraits as having a presence, that is the sense of being alive.

The Salvator Mundi is an iconic depiction of Christ providing a blessing with the left hand and holding an orb representing the Earth in the right hand (Kempe, 2024). The icon of the Christ was viewed by Jung (1959a) to be the representation of the most realized self in the western tradition. Leonardo da Vinci's Salvator Mundi, Christ the savior of the world, was described by Kempe (2019) as having a divine presence and is depicted looking directly out of the painting in to the eyes of the observer (Kempe & Gresham College, 2019). It is likely he never finished his Salvator Mundi as he continued to work on it between 1490 until his death in 1519 (Kempe, 2024; Kempe & Gresham College, 2019). He rarely completed his paintings and was likely dissatisfied with his

portrayal of the icon of Christ (Kempe & Gresham College, 2019). His lack of satisfaction and frustration may be because he believed his rendering of the gaze of Christ did not sufficiently transmit the blessing, salvation and illumination of the most realized self in to the mind of the observer.

Leonardo da Vinci, arguably, did eventually succeed in capturing the gaze of the most realized self in another portrait that he worked on until his death. The portrait of Lisa Gheradini, the wife of a Florentine silk merchant, also known as the Mona Lisa, portrays a gaze and an expression that has captivated a global audience in their attempt to comprehend what she is thinking and seeing (Kempe & The Aspen Institute, 2017). The painting was worked on by Leonardo da Vinci from 1503 until his death in 1519 and has been a source of fascination for all who have observed her or been observed by her ever since (Kempe & The Aspen Institute, 2017). The painting attracts eight of the ten million visitors to the Louvre in Paris annually (Marr & World's Most, 2024). The face of the Mona Lisa depicts a mysterious gaze and expression commonly interpreted as a smile but her expression defies clear interpretation.

Livingstone (2009) employed neuroscience to elucidate the techniques Leonardo da Vinci used to depict the mysterious quality of the Mona Lisa's smile. Leonardo da Vinci created a sense of movement by using subtle changes of light and dark shadows on her face to exploit differences in perceptual acuity between central and peripheral vision. The shadows around Lisa's mouth appear to be smiling when central vision is focused on her eyes, but not smiling when the focus moves to her mouth. The expression on her face conveys the illusion that she is looking at the one observing her. She appears to be moving and therefore alive. The illusion of movement is the result of perceptual confusion as the observer's eyes move back and forth between Lisa's eyes and mouth trying to understand her gaze and discern what she is thinking as she looks out of the painting at the observer. Lisa is smiling when the observer looks at her eyes and not smiling when the observer looks at her mouth creating intense curiosity in the one looking or the observer.

Advances in artificial intelligence has enabled further analysis of the facial expression of the Mona Lisa. A computer analysis of her smile indicated that her facial expression conveyed the following constellation of emotion; 83% happiness, nine% disgust, six% fear and two% anger (Connor, 2005). This complex expression suggests a specific focus. She is not 100% happy. The presence of slight disgust and even less fear and anger suggest she is conscious and aware of what she is seeing. The diversity of her emotion indicate some thought and reflection, possibly recognition of the person she sees. Lacan believed all human desire was essentially the desire of the other, that is to be desired, seen and known by the other (Evans, 1996). The global fascination and drawing power of the Mona Lisa strongly suggests Leonardo da Vinci was successful in his portrayal of the gaze of the other as the elusive object who sees, in the one who is looking, the realization of the self.

2.6 Process Oriented Psychology

Process oriented psychology is a therapeutic approach and paradigm developed by Arnold Mindell that integrates psychology with quantum physics. Mindell (2012) was originally a student of physics. He studied physics at the Massachusetts Institute of Technology. Inspired by the path of Albert Einstein, he also attended the Eidgenosisched Technische Hochschule in Zurich in 1961 as an exchange student. Mindell arrived one week after Carl Jung died. He met many psychology, physics and engineering students in Zurich who introduced him to Jungian psychology. Mindell described a significant dream he had about Jung shortly after arriving in Zurich. The dream figure of Jung asked him, “Well Arny don’t you know what your job in life is?” (Mindell, 2012, p. 341). The dreaming Mindell replied “No, I don’t know!” (Mindell, 2012, p. 341). Jung answered in Mindell’s dream, “Well, the job that you have in your life is to find the connections between psychology and physics” (Mindell, 2012, p. 341). Mindell passed away in 2024 leaving behind a substantial body of published work and the international legacy of process oriented psychology with established associations globally (International Association of Process Oriented Psychology [IAPOP], n.d.). Process oriented psychology is a therapeutic approach that is in accordance with Goswami’s (2011) concept of integral medicine. Both approaches are derived from quantum physics describing the movement of consciousness, the process of awareness and becoming aware and how these elements effect the material universe and the health of the human body.

2.6.1 Therapeutic Concepts

2.6.1.1 Information Field. The theoretical framework of process oriented psychology is derived from information theory which states the emergence and coherence of systems in the material universe occur as a function of information. The flow of information within and between systems regulates, maintains, develops and evolves the system (Mindell, 2011b; Strachan, 2022). Haramein (2018) described the information field in terms of extremely small planck scale quantum oscillations that carry signals or bits of information. His findings (Haramein, 2013a; Haramein et al., 2016), confirmed by Brown (2019), demonstrated that planck-scale micro wormhole entanglement is a potential mechanism by which signals or information flows and moves through the universe. Signals, in the context of the therapeutic experience, can be almost imperceptible experiences detected by the observer and also include information conveyed by words, sounds, actions, gestures, expressions or body felt experiences (Goodbread, 1997; Mindell, 2010).

The quantum network structure facilitates system coherence due to the mechanism of feedback limiting system deterioration due to entropy. Systems can be considered open or closed (Strachan, 2022). They differ in terms of movement and the receipt of new information. Open systems, such as organic systems, receive new information and tend towards homeostasis and coherence due to feedback mechanisms whereas in a closed system movement eventually ceases due to entropy

and decoherence. Mindell (2010; 2011b; 2012; 2019a) proposed ‘processes’ as the feedback mechanism phenomena, observable signals emerging from the information field, that is responsible for the self organizing coherence generating tendency of open systems (Strachan, 2022). Psychological and physical symptoms develop and resolve or unfold, as Mindell (2010) described responding to processes, depending on the level of awareness present and the capacity to notice, engage, express and integrate information carrying signals.

2.6.1.2 Processmind. The processmind is the concept and term used in process oriented psychology to describe the organizing field in the background giving coherence and structure to the material universe and to the lives of people as individuals and as a collective. Mindell (2010, p. 315) defined the processmind as “the dreaming intelligence and field that organizes all our experiences”, “a nonlocal ‘oneness’ experience [that] appears in dreams and reality as the diversity of things catching our attention and interest” and it is also “the deepest part of ourselves, associated with a part of our body and of an Earth location”. Mindell (2000; 2012) initially introduced the processmind as the quantum mind which he derived from the mathematics and laws of quantum physics. The quantum mind exhibits “the tendency to self reflect, to produce and notice quick, easily marginalized flirts catching our attention, and to collapse or repress the wave functions or dreams to create reality” (Mindell, 2010, p. 315). Mindell (2010) suggested the processmind moves and organizes people and events similar to the way in which the electromagnetic field moves and organizes lightning flashes between the Earth and the sky. The processmind is both a general principle and also unique to each person, relationship, group, organization and place. The field of the processmind existed before looking at or observing something. It is entangled with the observer and the observed and also exists between these two positions. Mindell (2010) described the processmind as a kind of pilot wave or guiding pattern that holds and carries non local information about people, objects, events and places. It is possible to separate from or marginalize awareness of the processmind field. This is necessary to engage in self reflection and to create consensus reality not through observation precipitating wave function collapse but by engaging in the process of self reflection, then marginalizing or pushing out of awareness the part of the self that is dreaming.

2.6.1.3 Dreaming. The concept of dreaming is used within the process oriented psychology paradigm to describe the quantum or base level of reality and also the process by which the material universe emerges. Mindell (2002a) defined the dreaming as “the energy behind everything; it is the life force of all living beings, the power of trees and plants, and the power of motors, business, and financial centers” (Mindell, 2002a, p. 36). Mindell (2002a) incorporated the Australian Aboriginal understanding and practice of dreaming into process oriented psychology due to its similarities with the concepts of quantum physics. Some Australian Aboriginal peoples have explained the dreaming by describing the

act of looking at the moon (Mindell, 2002a). The observer's attention, generally speaking, is focused on the illuminated bright part of the moon, however this part is not the whole moon. The object known as the 'moon' also includes the part that is obscured by the Earth's shadow. The bright side of the moon is being used metaphorically to describe consensus reality. The dark side of the moon is being used to refer to the dreaming. The Australian Aboriginal people described the dreaming as the root and essential power from which the material world arises.

The dreaming is similar to the invisible mathematical concept of quantum wave potentials from which the material world has emerged according to quantum theory (Mindell, 2002a; 2012). The quantum universe and the dreaming cannot be observed or measured directly (Mindell, 2002a). Quantum potentials were defined by Heisenberg as a "sort of tendency for things to happen" (Mindell, 2002a, p. 16). Psychological or bodily tendencies also exist and are not detected by measurement but by experience. They are sensed or noticed and occur through the aspect of awareness that is reached by the imagination. This is a kind of dreaming. According to the Australian Aboriginal understanding of the dreaming, objects are imbued with energy that draws or repels attention similar to the role the observer plays in collapsing the wave function (Mindell, 2002a). The dreaming cannot be damaged or destroyed and, similar to quantum potentials, exists as a coherent whole. Awareness and expression of the dreaming, however, can be limited, blocked and ignored resulting in diminished and or a split in awareness of the self and the perception of reality which in turn can have detrimental effects on physical and psychological wellbeing.

6.2.1.4 Dreammaker. Drawing inspiration from the Australian Aboriginal culture, Mindell (2002a; 2002b) proposed the concept of the 'dreammaker' as the origin and source of dreams and the dreaming. He also referred to the dreammaker as the 'big you' or 'big u' and defined this as "the sentient core of everything that catches your attention as well as the things themselves" (Mindell, 2002a, p. 228). Mindell (2002b) explained the nature, purpose and function of the dreammaker by once again using a comparison to the moon. Life on Earth is influenced by the moon through the effects of the gravitational field on water and the Earth's oceans causing the phenomenon of tides. Similarly the dreammaker influences through sentient awareness that is the subtle signals "usually forgotten, altered states of consciousness and mystical experiences that occur continuously throughout both day and night" (Mindell, 2002b, p. 93).

Mindell (2002b) proposed it was possible to begin to know the dreammaker's thoughts and mind, so to speak, by becoming aware and training attention to notice these subtle tendencies, he called dreaming or quantum 'flirts'. Mindell (2002b) further proposed quantum flirts were necessary to explain the way in which observation takes place in the real world as the distinction between the observer and observed in the quantum paradigm is not obvious. They are entangled as 'you' and 'I'.

Both are part of the dreammaker's mind engaged in a process of self reflection. Mindell (2002b) perceived that human beings are necessary channels for the impulses and perceptions of the dreammaker. Furthermore Mindell (2002b) observed the dreammaker exhibited the tendency to marginalize some signals and perceptions in order to precipitate or bring about the appearance of separation between the observer and the observed. Mindell (2002b; 2010) suggested the dreaming of the dreammaker creates three levels of reality; an essence level where dreaming impulses that cannot be observed emerge, a dreamland or the place of dreams that pattern reality and can be perceived in a non ordinary state of consciousness and the consensus or observable reality which marginalizes the dreaming origins of the physical world. Mindell (2002b) concluded that dreams and the process of dreaming are necessary to observe the everyday world, the nature of the dreammaker is self reflection and this process of self reflection creates consensus reality.

6.2.1.5 Dreambody. The dreambody is the concept proposed by Mindell (2004; 2010; 2011a) that described the entanglement between embodied experience and dreams such that body symptoms are connected to dreams. Mindell (2011a) proposed the dreambody as the bridge between those experiences of the mind unable to be measured, such as the movement of consciousness, and the measureable experiences of the physical body. The dreambody is noticed or detected through subtle sentient signals that persist and subsequently emerge in the form of dream images, embodied experiences and body symptoms. Mindell (2011a) distinguished between the real body and the dreambody in the following way. The real body is the "result of objective physiological measurements" where as the dreambody is the "individual experience of the body" (Mindell, 2011a, p. 10). Descriptions of both the real and the dreambody are valid within the parameters of their own observable paradigms. Mindell (2011a, p. 11) likened the dreambody to a field experience in so far as the dreambody, as a field, has a "definite sensation of one's self as a process with only vague extremities in time and space". The dreambody is experienced and perceived in different ways across the three levels of reality proposed by Mindell (2010; 2011a). The dreambody in consensus reality is perceived as real embodied suffering incurred by "incongruities, accidents and symptoms" (Mindell, 2011a, p. 15). The dreambody is perceived in dreamland as "aggressive [conflicting] signals and/or as aggressive dream images of symptoms (Mindell, 2011a, p. 15). The dreambody is perceived at the deepest and most "subtle essence level" as "a deep, timeless organizing intelligence" that Mindell (2011a, p. 15) called the processmind. Depending on the focus of attention, some aspects of experience and perception of the dreambody impulses become marginalized. ersistent marginalization of dreams or the dreaming develop in to a habitual blockage in the flow of information and movement of consciousness and is subsequently expressed as embodied experience. This habit or obstruction becomes constellated over time and eventually appears as a physical symptom in the real body.

2.6.2 Therapeutic Techniques

2.6.2.1 Awareness. Awareness and the process of becoming aware is one of the foundational concepts in process oriented psychology from which all therapeutic techniques are derived (Mindell & Mindell, 2016). Mindell (2011b; 2012; 2016) observed awareness is a natural phenomenon that emerges as a consequence of the exchange between the observer, the observed and information arising from the field. Awareness applied as a technique involves noticing and bringing focus to the tendency towards self reflection that the material universe is perpetually engaged in (Mindell, 2012; Mindell & Mindell, 2016). Mindell (2011b) refers to changes in perception and the variations in signals experienced by the observer as a process. Information arises from the field in the form of subtle almost imperceptible experiences noticed by the observer, that is signals, or precursors to signals or split second signs that capture attention and seek expression, that is flirts (Mindell, 2010). The processmind field is the organizing principle operating in the background guiding the precipitation of the material universe (Mindell, 2010). Signals can be received but may remain unconscious or outside awareness (Mindell, 2011b). Some information is marginalized by the processmind due to self reflection and in this case remains outside of awareness.

The marginalization of some information signals separates the individual's potential experience of being whole in to two processes. Mindell (2011b; Mindell & Mindell, 2016) proposed those signals the person identifies with, that is 'I' or 'me', are considered the primary process and those signals with which the person does not identify, that is the not 'I' or the not 'me', is considered the secondary process. The primary and secondary process when considered together comprise a kind of human awareness system that is self organizing due to the influence of the processmind field. The system self regulates and maintains coherence through feedback mechanisms. Feedback can be obstructed by what Mindell (2019a) called the edge or the division that separates the primary from the secondary process. The edge creates a conflict within the self that prevents the individual from experiencing the unity of wholeness consciously and with awareness. Intervention techniques derived from the process of awareness involve noticing the flow of information signals from the primary and secondary process then facilitating communication or an exchange of information between the component parts. It is essentially identifying, becoming aware of and then facilitating processes already present trying to happen by giving them focus and attention so they can, as Mindell says, unfold their potential. 2.6.2.2 Dreamwork. Dreamwork is a collection of process oriented psychology techniques that engage with dreaming signals to facilitate the exchange of information between the primary and the secondary process. Dreaming is happening everywhere all the time but awareness of the dreaming can be obscured (Mindell, 2002a). Mindell (2002a) observed the tendency in the western world to dissociate from the dreaming as distinct from the practice and traditions of cultural groups such as the

Australian Aborigines, Hopi, Hindu, Tibetan Buddhist and Taoist. The marginalization of the dreaming created the need for dreamwork to reconnect to the dreaming essence because everyday reality is created and patterned by the dreams emerging from the dreaming (Mindell, 2002b). Dreamwork is teleological (Mindell, 2002b). It is a specific kind of awareness practice that brings focus to non ordinary states of consciousness so that meaning and purpose concealed from everyday awareness can be revealed.

Mindell (2002a) suggested reality could be considered and described in two ways depending on how it is being perceived. Consensus reality is the perception and experience of reality that is shared with others. It is objective and elements found within consensus reality are able to be collectively observed, measured and counted. Non consensus reality is not shared, can only be perceived by a non ordinary state of consciousness and has two qualities of dreaming. The dreaming, dreamtime or essence level of reality is a sentient preverbal experience, the source of dreams and "the root of all things" (Mindell, 2002a, p. 28). Dreamland is the place where the dreaming can be experienced, perceived and remembered as nighttime or daytime dreams, imaginings, fantasies and body experiences. Dreams have elements that are contained in different parts and clearly differentiated pictures. They can be described and discussed. Lucid dreaming is a kind of dreamwork where awareness is brought to notice dreaming tendencies, flirts and signals, emerging from the background dreaming field in everyday life (Mindell, 2002b).

Working with dreams involves relating the memories of dreamland to the elements of the experience of everyday reality, such as identity, age economics, health, social circumstances among others. Dreaming experiences included perceptions of sensations and nonverbal feelings noticed in the present moment (Mindell, 2002b). Dreamwork is considered by Mindell (2002b) to be valid when the origins and significance of a dream are experienced or processed.

2.6.2.3 Process Work. Process work is primarily an attitude towards people and nature and secondarily a collection of therapeutic techniques that aim to increase the awareness of processes already happening, being with and unfolding them. Mindell and Mindell (2016, p. 9) defined a process as "the change in what we observe, the flow of signals and the messages they carry". Process work is similar to dreamwork in focus, that is the dreaming process, but process work viewed dreaming in a more general and broader sense. The focus of process work is expanded to include night and day dreaming in individuals, couples, large groups and altered states of consciousness such as coma, near death and extreme states including psychosis (Mindell, 2002a). Process work brings an attitude respect and an interest in tracking, following and unfolding the unintentional and unknown signal expression across the body's communication channels (Mindell, 2011b).

Signals and processes are communicated through the different human senses (Mindell,

2011a; 2011b). Signal communication is distinguished and categorized depending on the perceptual sense that detects and expresses them. The sense channels for human beings are visualization, audition, proprioception and kinesthesis. Signals can be introverted, that is perceived internally and inwardly, or extroverted, that is perceived externally and outwardly (Mindell, 2011b). Channels can be composite such as the relationship channel, where a person not present becomes the focus of conversation, or the world channel, where the focus is the outer world, the universe, unfamiliar people, foreign objects and events among others (Mindell, 2011b). Channels can be occupied and being used to express signals or unoccupied or not being used to convey signals. Noticing the channels being used in a process is an important aspect of the process work intervention.

Processes can become obstructed in their signal expression so techniques are required to activate the process once more. The stalling of process is more likely in situations where an individual is identified with one or some particular channels of perception and expression (Mindell, 2011b; 2019a). Signals can be amplified using active imagination which increases awareness of the underlying process structure, in particular the detection of the edge which delineates primary and secondary processes (Mindell, 2019a). Double signaling occurs when signals from both primary and secondary processes are communicated at the same time revealing a process incongruence (Mindell, 2010; 2019a). The therapeutic goal of process work is to notice, amplify and unfold double signals to increase the expression of congruence by bringing awareness to the secondary process (Mindell, 2014d). Process work looks for feedback in response to interventions because there is no right or wrong way to do process work. “There is only on or off the process” (Mindell & Mindell, 2016, p. 28). Process work brings awareness to the flow of signals through communication and sense channels of the body and supports individuals to discover personal meaning through the unfolding of processes.

2.6.3 Therapeutic Relationship

2.6.3.1 Compassion. A foundation of compassion is required before the therapeutic relationship is able to facilitate transformation through unfolding the client’s process. Mindell (2016) distinguished an effective from an ineffective therapist in terms of their capacity for compassion and empathy. Mindell (2016, p. 69) suggested compassion within a process oriented psychology paradigm was not a skill but rather a metaskill that is “the subtle feeling ability of healers” or the notion that an encounter with the therapist’s own self can be considered a kind of therapy separate from their skills, knowledge and training. Compassion within a process oriented psychology approach refers to the ability of both therapist and client to notice, meet, interact with and relate to all aspects of the self. Mindell (2007, p. 189) described compassion as “love in action” and defined the metaskill of compassion as “nurturing, caring for, and attending to those parts […] that we like and identify with while attending equally to and appreciating those parts that we do not like, that

we disavow and that are far from our identity" Mindell (2016, p.67). The process oriented psychology approach proposed that the therapeutic relationship, when built on a foundation of compassion, has the capacity to unfold different parts of the self, consciously reveal their essential nature and develop a deeper understanding of their meaning (Mindell, 2007; 2016). Mindell (2016) observed utilizing compassion within the process oriented psychology approach required not only openness to different experiences but also a scientific ability and even a method to find those experiences obscured by a lack of awareness.

The nature of primary and secondary processes increase the tendency for both the therapist and the client to give the most focus and attention to the client's primary process thereby rejecting the secondary process. The foundation of compassion within the therapeutic relationship enabled necessary attention and focus be given to the client's secondary process (Mindell & Mindell, 2016). A compassionate approach facilitates noticing, observing and interacting with the flickering flow of information signals and supported exploration and taking necessary risks when an edge is discovered and encountered in the therapeutic exchange. The metaskill of compassion assists both therapist and client move in and out of the position of observer and observed (Mindell, 2014a). Furthermore approaching therapeutic work with compassion supports the therapist to trust and believe in the internal wisdom and process of the client and follow the client's awareness process. Compassion within the therapeutic relationship enabled the inclusion of all parts of the client's self within the therapeutic exchange and experience thereby accessing the secondary process necessary for unfolding and transformation.

2.6.3.2 Second Training. The second training is the collection of therapeutic skills that enables the client's process to be unfolded within the therapeutic relationship, that is through a relationship with the therapist. Mindell (2010, p. 312) defined the secondary training as the ability of the therapist to engage in active imagination, "briefly shapeshift" in to the "processmind and facilitate the relationship between parts of systems". The therapist's command of the second training enabled them to be "half in the realm of dreaming while half out in reality, facilitating the flow" of consciousness and awareness "between experiences" (Mindell, 2010, p. 313). The first training involved the therapist learning and practicing professional skills that have a focus and locus mostly within consensus reality. The second training focused more on the phenomenon of the processmind, those happenings present in the background that can be sensed and or perceived through the imagination. Mindell (2010) distinguished between primary and secondary training for therapists in terms of hard and soft therapeutic skills. Facilitating signal exchange in communication between client and therapist is an example of a hard skill. A soft skill, by comparison, is the difficult to quantify emotional intelligence needed to work cooperatively with others and the universe, that is the big other. The nature of the second training would be

considered a soft skill due to the difficulty specifying it precisely.

Mindell (2019b) proposed a four phase model that describes the phenomenological movement of consciousness in the processmind, present in the therapeutic exchange, in order to teach therapists how to practice the second training. Phase one and two occur in consensus reality. The individual in phase one is described as someone who is largely unaware of anything outside their own immediate focus and primary process. Phase two is where confrontation with what has been marginalized or ignored happens and conflict erupts. Phase three is dreamlike. Those roles involved in the conflict are switched and attention and focus are given to becoming the different elements in the conflict by using active imagination. Phase three proposed those elements an individual is in conflict with are also a hidden and marginalized part of themselves. Phase four is where consciousness and attention has become temporarily synced and or aligned with the essence level of awareness and there is a felt sense of unity as an embodied experience. Mindell (2019b) observed the quantum wave function as a phase four experience. He described the wave function as a "essence level that cannot be measured" and as a "wave like pattern or essence" that is present before consensus reality" (Mindell, 2019b, p. 18). Mindell (2019b) highlighted the importance for therapists to be open to consciously embrace phase four as this skill enables therapists to more easily flow with all other phases of the client's process. The therapist's second training is that which enabled the person seeking therapy to interact with those aspects of themselves they reject and marginalize, to unfold their process, and in so doing and move towards a greater sense of unity and integration.

2.6.3.3 Dreaming Up. The therapist can facilitate client transformation by using their awareness to allow themselves to be dreamed up by the client's secondary process. Mindell (2014d) referred to the phenomenon of being dreamed up as taking on the felt experience and giving expression to the other's unconscious process, dreams and double signals. The "therapist begins to act as if he or she were a part of the client's process that the client has disavowed" (Mindell, 2016, p. 11). This phenomenon is not unique to process oriented psychology and was first identified as having a potential therapeutic application by Freud and Breuer (1893/2001). Psychoanalytic treatment largely focused on the relationship dynamics occurring between client and therapist whereby the client projects or transfers unconscious material, such as desire, on to the therapist and attributes these thoughts and motivations to them. Analysis of transference material constituted the main focus of psychoanalytic treatment (Fink, 2007). Transference is not only a client to therapist phenomenon. Counter transference, where the therapist projects unconscious material on to the client, can also occur. Unacknowledged or unprocessed counter transference can damage the therapeutic relationship and result in the therapist and client acting out the transferred material of unconscious desires (Fink, 2007; Mindell, 2011b; 2019a).

Mindell (2011b) observed, from the process oriented psychology perspective, the therapeutic relationship is comprised of two coupled systems, that is the client and the therapist, who act together as if they were one system. He proposed they are dreaming together and dreaming each other up. The reactions of the therapist within the therapeutic exchange are influenced by the dreamer's dream field. Mindell (2011b) suggested most dreamed up reactions on the part of the therapist occur because the therapist missed double signaling on the part of the client and instead unconsciously reacted to the client's dreaming process. The therapist, in the case of counter transference, has become part of the client's dreambody. Similarly the client can become a channel for the therapist's dreaming process. Dreaming up that is not worked with therapeutically will block progress. Mindell (2011b, p. 37) proposed identifying the "strongest signal occupying the foreground of awareness" and address this deadlock by employing the technique of amplification until processes begin once more. If the strongest signal expression is happening on the part of the therapist, then it is necessary for the therapist to focus temporarily and briefly on their own process and reveal this to the client within the session. Working with the process of dreaming up within the therapeutic relationship facilitates transformation of both client, therapist and potentially the collective unconscious dream field as well.

2.7 Present Study

2.7.1 Rationale for Approach

Process oriented psychology, as a therapeutic approach, is derived from quantum theory and is, therefore, a form of quantum medicine. The application of process oriented psychology to the treatment of complex trauma further develops the value and extends the scope of the practice of quantum medicine. Community life in modern Australia is defined to some degree by the legacy of colonization and immigration, that is intergenerational trauma. The residual effects of violence, genocide, dispossession of ancestral lands and the loss of cultural heritage, in addition to the reasons that motivated many to leave their homelands and seek a new life in Australia continue to exert influence just outside of awareness. The legacy of colonization and immigration are evident in the form of physical symptoms and psychological conditions that were once dreaming signals but became symptoms after being marginalized by the process of dissociation. These maladies are often resistant to treatment approaches indicated by mainstream medical science because they originate in the non linear processes of quantum mechanics.

The dreaming legacy of colonization and immigration to Australia cannot be avoided due to the non local residual imprint of information and memory in the quantum field. Awareness of the legacy can be marginalized by dissociation thereby slowing or stalling processes of integration, coherence, healing and recovery. Process oriented psychology approaches the treatment of complex trauma and the

concomitant dissociation by using awareness of the entanglement process between the client and therapist. The therapist and client engage with the tangled hierarchy of observer, observed and the field of information through dreaming, noticing and working with signals and quantum flirts. The therapist and client together become a system that is moving toward coherence due to the flow of information through feedback mechanisms. Awareness of dreaming processes, information signals and signal exchange enabled both client and therapist to progressively restore and rebuild information, communication and relationship channels that had become obstructed or limited by dissociation.

2.7.2 Hypothesis Statement

Quantum entanglement between therapist and client, using applied process oriented psychology, facilitates progressive transformation from the trauma self in to the healed authentic self, as indicated by reduced in levels of dissociation, in the case of complex post traumatic stress following exposure to intergenerational trauma.

3. METHOD

3.1 Research Design

A repeated measures experiment design was employed to investigate the effects of process oriented psychology in the treatment of complex post traumatic stress in cases where there is also a history of intergenerational trauma. The independent variable was designated as quantum entanglement within the therapeutic relationship developed through the therapeutic application of process oriented psychology. The dependent variable was measured levels of dissociation as an indication of trauma and recovery. The repeated measures experimental design was selected because of its compatibility with the process of treatment. Additionally a repeated measures approach was unlikely to disturb the treatment process by focusing on the research investigation rather than clinical intervention. The repeated measures experimental design limited the influence of random variability between individual participants by measuring the same participants under the same treatment conditions at the same stage of the treatment.

3.2 Participants

Thirteen subjects participated in the study. The participant group comprised of six men and seven women, ranging in age from 21 to 72 years. The education level of participants was between 10 and 16 years. Participants varied in relationship status from single, widowed, married, in a de facto relationship to divorced. Participants also varied in their employment status, that is being retired, employed, unemployed, studying and performing home duties. Lastly participants also varied in their housing status from renting, to home ownership to homelessness. A participant was considered homeless if they were neither a home owner nor a lease holder.

Table 1 shows details of participant demographics.

Table 1

Demographics of Participants

Participant	Age	Gender	Years of Education	Relationship Status	Employment Status	Housing Status
1	72	Female	10	Widowed	Retired	Owner
2	36	Male	15	Married	Employed	Renter
3	41	Male	14	De Facto	Unemployed	Owner
4	37	Female	16	Married	Employed	Renter
5	39	Female	16	Married	Employed	Owner
6	23	Female	12	De Facto	Studying	Renter
7	37	Male	16	De Facto	Employed	Owner
8	46	Male	16	Married	Employed	Owner
9	29	Male	12	De Facto	Home Duties	Owner
10	47	Male	10	Divorced	Unemployed	Homeless
11	26	Female	12	Divorced	Employed	Renter
12	32	Female	16	De Facto	Employed	Renter
13	21	Female	13	Single	Studying	Homeless

3.2.1 Sample Size, Power and Precision

A one tailed Wilcoxon signed rank test for matched pairs is indicated for statistical analysis in the case of a repeated measures experiment design with paired samples. Measures were taken before and after treatment and an improvement in clinical presentation was expected. The data collected is anticipated to have a non parametric distribution because participants have been selected based their clinical presentation (Howell, 2009). The Wilcoxon signed rank test is suitable for smaller sample sizes that are ideally between two and 25 participants (Howell, 2009). Statistical power, in general terms, increases with sample size. Once a sample size has reached 25 or more participants, the data collected approaches a normal distribution and it is more suitable to use a parametric test to assess differences between treatment groups.

Statisticians Howell (2009) and Kang (2021) have recommended the use of the G*Power (Faul et al., 2007) online software to calculate statistical power and required sample size for statistical significance in distinguishing between the null and alternative hypothesis. The G*Power manual (2023) recommended using

conservative input parameters, that is the asymptotic relative efficiency method, to estimate the parent distribution. The G*Power manual incorporated the effect size convention proposed by Cohen (1988) of small, medium and large effect sizes being designated as d values of .2, .5 and .8 respectively. Some researchers have commented that this convention is arbitrary and not universally applicable to all areas of research (Brydges, 2019; Thompson, 2007). The required sample size calculated by the G*Power online software program can be found in Table 2 for the Wilcoxon signed rank test for matched pairs for effect size of d = .8. A large effect size was included in the calculation because the study is investigating the effect of treatment and a meaningful therapeutic effect was expected.

Table 2

G*Power Recommended Sample Sizes

Effect Size	Type 1 Error [α]	Power [1 - β]	Sample Size
0.8	0.05	0.95	22
0.8	0.05	0.80	13

3.2.2 Sampling Procedures

Participants were selected from my practice records. Selection criteria was determined based on the research focus, that is participants who received treatment for complex post traumatic stress and who also had a history of intergenerational trauma. Additionally participants were selected if they scored three or more on the Primary Care Post Traumatic Stress Disorder Screen for DSM-5 (Prins et al., 2016). This indicated the likely presence of diagnosis of PTSD (Prins et al., 2016; Prins et al., 2003). A history of intergenerational trauma was determined during treatment if the participant disclosed exposure in childhood to one or more of the major types of abuse, that is physical, psychological, sexual and or neglect (Australian Institute of Family Studies [AIFS], 2018). Participants were selected if they had participated in treatment for a minimum period of 18 months. This criterion was determined due to Bowlby's (1979; Bowlby, 2019) findings regarding the necessary time taken to develop a secure attachment and reciprocal relationship, particularly as it applies to the therapeutic relationship (Connors, 2011). This amount of time was required to establish the therapeutic relationship between myself and the participant.

3.3 Materials

3.3.1 Primary Care Post Traumatic Stress Disorder Screen for DSM-5 (PC-PTSD-5).

The PC-PTSD-5 was used to select in participants by identifying a recent exposure to a trauma inducing event (Prins et al., 2016). The

PC-PTSD-5 is a brief screening tool made up of five items designed to detect and indicate a probable diagnosis of PTSD. The PC-PTSD-5 is an updated version developed to reflect the evolution of the diagnostic criteria for PTSD in the DSM-5 and includes an additional item regarding the subject experience of shame and guilt associated with the trauma exposure.

The initial version of the Post Traumatic Stress Disorder Screen (PC-PTSD) developed for use with the fourth edition of the DSM has indicated strong reliability and validity as a PTSD screening measure. The PC-PTSD demonstrated good test-retest reliability with Pearson's correlation coefficient being $r = .83$, $p < .001$ (Prins et al., 2003). These authors compared the results of the PC-PTSD with the Clinician Administer Scale for PTSD and demonstrated strong validity. They found Spearman's rank biserial correlation to be $rrb = .83$, $p < .001$. These findings suggest the initial version of the PC-PTSD is both a reliable and valid screen tool for the identification of a probable diagnosis of PTSD.

Prins et al. (2016) assessed the validity of the revised PC-PTSD-5 for use in the detection of a probable diagnosis of PTSD. These authors compared the results of the PC-PTSD-5 with those of a brief psychiatric interview, a modified version of the PTSD module in the Mini International Neuropsychiatric Interview (MINI), to assess the reliability and validity of the its use as a screening tool. The MINI was identified as a comparison screening tool because at the time of writing Prin et al. (2016) there was a lack of studies confirming the reliability and validity of screening tools for use with the changed diagnostic criteria for PTSD diagnosis in the DSM-5.

The MINI has previously been validated against the Structured Clinical Interview for DSM (Sheehan et al., 1997) and the Composite International Diagnostic Interview (Lecrubier et al., 1997). Prins et al. (2016) used a measure of Cohen's kappa (k) to indicate inter rater agreement between the two measures, that is reliability, and the area under the curve (AUD) to assess the diagnostic capacity of the PC-PTSD-5, that is validity. They found the PC-PTSD-5 demonstrated excellent diagnostic accuracy, AUD = .94, 95% CI [.91 - .97] and further determined a score of 3 on the PC-PTSD, with $k = .93$, $SE = .04$, 95% CI [.85 – 1.00], was optimally indicative of a likely PTSD diagnosis using the DSM-5.

3.3.2 Dissociative Experiences Scale (DES).

The DES is designed to measure a broad scope of dissociative phenomenon (Carlson & Putnam, 1993). It is a brief self reported measure of the daily frequency of dissociative experiences described in terms of a percentage. It was originally designed to measure the trait rather than state of dissociation and to be used as a screening tool for determining the contribution of dissociation to a range of mental health diagnoses. The measure was developed for use with an adult clinical population over the age of 18. The DES has good test re-test reliability, $r = .83$, $n = 26$, $p < .0001$ (Bernstein & Putnam, 1986) and $r = .96$, $n = 30$, $p < .0001$

(Frischholz et al., 1990) in addition to good internal reliability. Split Half measure of internal reliability was r = .83, n = 73, p < .0001 (Bernstein & Putnam, 1986) and Cronbach's Alpha, α = .95, n = 321, p < .0001 (Frischholz et al., 1990). Carlson and Putnam (1993) reported strong construct validity for the DES with high scores being obtained from groups expected to exhibit increased incidents of dissociation such as those with a diagnosis of PTSD. The DES has demonstrated reliability and validity in the efficient screening and self reported measurement of trait dissociation.

3.3.3 Shutdown Dissociation Scale (SDS).

The SDS is a scale designed to assess the dissociative response precipitated by exposure to traumatic stress (Schalinski et al., 2015). It is a brief structured interview, consisting of 13 questions, based on the psychobiological model of the defense cascade that occurs following an encounter with a life threatening stimulus (Schauer & Elbert, 2010). The SDS assesses on the physiological indications of dissociation, that is biological symptoms that are indicative of the body's instinctive freeze, fight/flight and or fawn/faint reaction to trauma. The SDS has exhibited a correlation between the presence of childhood trauma and elevated scores on this measure (Schalinski et al., 2015). Reliability of the SDS was assessed using Cronbach's Alpha, α
= .83. The results showed strong internal consistency (Schalinski et al., 2015). The test re-test correlation coefficient was similarly strong, r = .93, p < .0001, 95% CI [.88 - .96], indicating scale reliability. Validity of the SDS was examined using predictive and convergent validity. Schalinski et al. (2014) measured dissociation levels of patients with PTSD or trauma related depression symptoms following exposure to emotionally evocative pictures. These authors found the treatment group scored highly on the SES in their daily lives and following exposure, r = .66, p < .0001. The correlation coefficient increased, r = .79, p < .0001, when the healthy control group was included. Schalinski et al. (2015) assessed the scale's convergent validity by comparing scores of patients with borderline personality disorder, dissociative identity disorder and healthy controls. They found overall correlation of the sum score, r = .86, p < .0001, to be significant. Further, these authors found significant associations with the subscales of the DES; amnesia, r = .70, p < .0001, absorption, r = .72, p < .0001 and derealization, r = .74, p < .0001. SDS is both a reliable and valid measure of trait dissociation.

3.4 Procedure

Prospective participants were identified by a review of my practice records from most to least recent cases. The first 13 potential participants who had engaged with treatment for a period of time greater than 18 months, scored greater than three on the PC-PTSD-5, indicated a history of intergenerational trauma during treatment and completed both the DES and SDS before and after treatment were approached for inclusion in the study. Participants were also asked to write in a journal and take a walk by themselves each day during treatment to develop an awareness of their

internal experience and their subjective perception and sense of the field.

3.5 Data Analysis

The one tailed Wilcoxon sign rank test for paired samples was selected to assess the significance of change in dissociation levels before and after treatment in the sample group. This test was selected due to the small sample size involved in the study, the repeated measures experimental design, measures of dissociation were expected to reduce and the data collected was anticipated to have a non normal distribution due to the sample being recruited from a selected group, that is individuals who received psychological treatment. Several statisticians have argued the utility of the Wilcoxon signed rank test for paired samples is dependent on key assumptions regarding the collected data (de Smith, 2021; Ott & Longnecker, 2015. The assumptions required the Wilcoxon signed rank test for paired samples are as follows; the data collected is paired, data is measured on a continuous scale, the distribution is symmetrical but not normal, measured differences are mutually dependent, differences are able to be ranked and participant selection approximates random sampling of the population. Data assumptions were assessed using Statistical Kingdom (2017) online software and statistical analysis conducted using the Social Science Statistics (Stangroom & Social Science Statistics, 2018) online software that has been audited for accuracy against the Statistical Package for the Social Sciences (IBM Corp, 2017).

4. RESULTS

4.1 Descriptive Statistics

4.1.1 Central Tendency & Variability

The data sample collected does not conform to a normal distribution. Measures of central tendency, that is mean, median and mode, and variability, that is standard deviation, are presented in Table 3 to provide descriptive information regarding the measures of dissociation used in the study, that is the SDS and the DES.

Table 3

Central Tendency & Variability of Data Sample

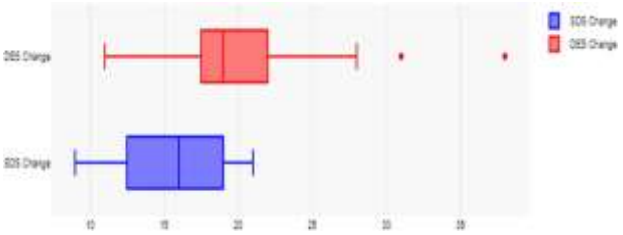
Data Sample	Mean	Median	Mode	Standard Deviation
SDS Before	25.69	26	29	2.69
SDS After	10.08	8	7	4.42
DES Before	47.31	44	42	8.02
DES After	26.46	24	24	4.65

4.1.2 Assumptions for the Wilcoxon Signed Rank Test

4.1.2.1 Symmetry. Symmetry within the collected data sample was assessed for both measures of dissociation, that is the difference between the scores on the DES and SDS before and after treatment, using box plots generated by Statistics Kingdom (2017). Figure 1 shows a box plot for the difference in SDS and DES scores before and after treatment. Both box plots showed indications of a symmetrical distribution. The interquartile range for both measures were bound by whiskers and the median value for both measures was found to be within the interquartile range.

Figure 1

Differences in SDS and DES Scores



4.1.2.2 Distribution Characteristics. The distribution characteristics of both measures of dissociation, that is the SDS and DES scores, were assessed for normality using a visual inspection of the histogram (Gupta et al., 2019). Figure 2 shows histogram for SDS scores before and after treatment. Figure 3 shows histogram for DES scores before and after treatment. Both histograms indicated a non normal distribution.

Figure 2

Distribution of SDS Scores Before and After Treatment

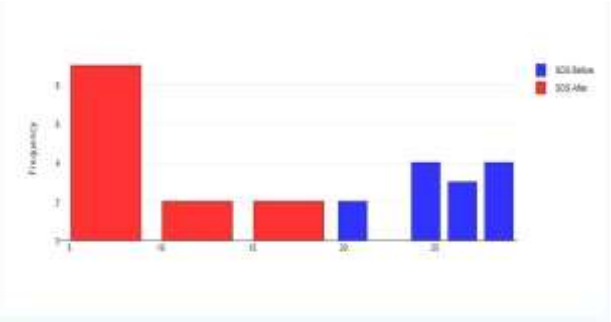
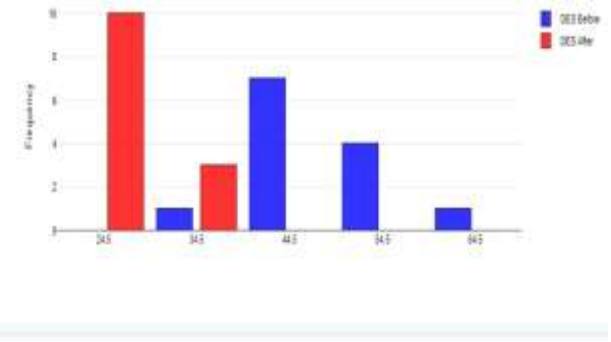


Figure 3

Distribution of DES Scores Before and After Treatment



4.1.2.3 Random Sampling. Participants for the study were recruited from my practice records so the sample used in the study cannot be considered a random representation of the wider population. The participant sample is a representation of those members of the population who have sought treatment for psychological symptoms. Additionally, the focus for the study necessitated participants differed from a random representation of the population in terms of exhibiting signs and symptoms of complex post traumatic stress and intergenerational trauma. The selection process

used to recruit participants has attempted to replicate some of ways in which the risk of sampling error is reduced by using random selection to recruit research participants. The sample size of 13 was determined by statistical analysis of power and effect size found in Table 2. The recruitment process selected the first 13 individual treatment records, from most to least recent, who met the selection criteria. Despite the small sample size, the demographic information collected regarding participants found in Table 1 indicated participants vary across the following characteristics; age, gender, education and relationship, employment and housing status reflecting similar variation within the wider population.

4.2 Analytical Statistics

4.2.1 Wilcoxon Signed Rank Test for SDS

A one tailed Wilcoxon signed rank test indicated the median score for dissociation as measured by the SDS was significantly lower after the intervention (Md = 8, n = 13) compared to before (Md = 26, n = 13), $z = -3.18$, $p < .05$ with a large effect size, $r = .62$.

4.2.2 Wilcoxon Signed Rank Test for DES

A one tailed Wilcoxon signed rank test was conducted on the DES scores before and after treatment. The test found median dissociation was significantly lower after the intervention (Md = 24, n = 13) compared to before (Md = 44, n = 13), $z = -3.18$, $p < .05$ with a large effect size, $r = .62$.

5. DISCUSSION

The purpose of the present study was to demonstrate, apply and gain a better understanding of quantum medicine's potential, specifically the therapeutic application of quantum entanglement between therapist and client, using a process oriented psychology approach to treatment in the case of complex traumatic stress following exposure to intergenerational trauma. Results indicate levels of dissociation significantly reduced across a minimum treatment period of 18 months for all 13 participants. Diminishing levels of dissociation are a good indication that the fright-flight-freeze response, characteristic of complex post traumatic stress, is healing and the alterations in self expression resulting from intergenerational trauma exposure are in the process of being restored. Dissociation represents an obstruction in the flow of information signals between different states of consciousness or different levels of awareness. The findings in the present study suggest that quantum entanglement within the therapeutic relationship is able to restore disruptions in the flow of information indicative of traits and states of dissociation through the application of therapist awareness.

5.1 Theoretical Implications

The findings of the present study regarding the significance of quantum entanglement within the therapeutic relationship presents a challenge to the foundational understanding of causality assumed by medical and psychological science. The importance of the

therapeutic relationship in facilitating positive treatment outcomes regardless of the approach employed is a robust phenomenon well established in the clinical literature (Bourke et al., 2021; Herrero et al., 2020; Horvath et al., 2011; Igra et al., 2020; Karver et al., 2018; Murphy & Hutton, 2017). The role of quantum entanglement in facilitating therapeutic outcomes however is not well established and is largely rejected as a legitimate element of the treatment process (Hyland, 2004; Kyriazos & Poga, 2024). Also dissociation is not only a phenomenon found in psychological trauma presentations. It can also be found in cultural assumptions such as the way in which the collective of science accepts or rejects different kinds of information. The scientific method mirrors the process of self reflection however information received from internal observations or from non consensus reality states of consciousness is excluded as evidence because it cannot be independently observed. The scientific method engages in a kind of information sampling bias.This exclusion of particular kinds of information is similar to the way in which dissociation excludes trauma signaling information from conscious awareness. This kind of selective sorting creates a repetitive cycle of collective observation that sees what has been already observed and prevents the perception, integration and evolution of new information in the scientific quest for knowledge.

5.2 Practical Implications

The practical implications of the present study's findings emphasize the importance of the therapist's self in the client's healing process. Process oriented psychology proposes an integrative model of consciousness grounded in quantum theory with a treatment approach that can be applied holographically, that is at different levels of complexity. It is difficult to identify the causal agent associated with the therapist's self that is responsible for healing because the therapeutic relationship is a tangled hierarchy. It may be more practical to consider therapist and client as parts of the self, as roles being dreamed up by the quantum field of consciousness, engaged and entangled in a perpetual process of self reflection. Determining therapist from client within the therapeutic exchange is not always obvious. On the one hand, the therapist's self awareness and self integration could distinguish them from the client. On the other hand the therapist may have dreamed up the client and their unique presentation trying to reconnect with a temporarily concealed aspect of themself. In this case client and therapist can be seen as companions mutually dreaming each other up in an unconscious collaboration. This means not only is the therapist not impartial, separate or independent from the healing process but their self and their conscious awareness is fundamental to healing. Developing the self for healthcare providers is not only worthwhile and beneficial for the practitioner but it is necessary and fundamental to healing for the client. Healing does not happen in isolation. It must be witnessed. It happens, when it happens, in relationship.

5.3 Limitations and Future Research

The inherent limitations within the present study suggest directions for future research in to the role of quantum entanglement within the therapeutic relationship and also the application of quantum medicine to health care. The present study is limited by a relatively small sample size (N = 13), the minimum length of treatment being 18 months and the experimental treatment condition of process oriented psychology being applied by one practitioner, that is myself. The data collected was not sufficiently large to conform to the normal distribution of data typically present in larger sample sizes. This approach was useful in demonstrating and examining the role of quantum entanglement within the therapeutic relationship because one practitioner significantly reduces potential sources of treatment variability between participants. This approach, however, is limited in terms of replicating the present study's findings to using myself as the treating therapist, that is using my clinical judgement in terms of applied process oriented psychology during a treatment session in a moment by moment way. This treatment application could be considered insufficiently precise to replicate the findings with an alternate therapist. This is a challenge for future investigation. Further research examining the role of quantum entanglement within the therapeutic relationship requires an updated model of medical and psychological science, such as process oriented psychology. Quantum medicine incorporates the fundamental understandings of the physical universe and expands the scope of this inquiry to incorporate sources of information previously discounted, that is both consensus and non consensus reality.

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