Treating Trauma Survivors with Neurofeedback: A Grounded Theory Study Based on the Practices of Experienced Mental Health Professionals

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TREATING TRAUMA SURVIVORS WITH NEUROFEEDBACK:
A GROUNDED THEORY STUDY BASED ON
THE PRACTICES OF EXPERIENCED MENTAL HEALTH PROFESSIONALS

by

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A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY
COUNSELOR EDUCATION AND SUPERVISION
OLD DOMINION UNIVERSITY
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ABSTRACT

TREATING TRAUMA SURVIVORS WITH NEUROFEEDBACK:
A GROUNDED THEORY STUDY BASED ON
THE PRACTICES OF EXPERIENCED MENTAL HEALTH PROFESSIONALS

Christine L. Currie
Old Dominion University, 2011
Dissertation Chair: Dr. Theodore P. Remley, Jr.

Neuroscience, the mental health field, and the concept of trauma as an underlying factor in mental and physical disorders have been inextricably linked since the inception of the mental health professions. Numerous quantitative studies have indicated that neurofeedback may be effective in ameliorating trauma symptoms; however, there is a paucity of research exploring the factors that produce those positive outcomes. The purpose of this qualitative grounded theory study was to explore the factors and processes that influence treatment outcomes when neurofeedback is used with trauma survivors. Thirty interviews were completed with ten experienced mental health and neurofeedback professionals identified through a nomination process with a snowball sampling method. For this study a wide definition of trauma was used that included traumatic brain injury, the DSM-IV-TR (2000) criteria for posttraumatic stress disorder, and the seven symptoms associated with complex trauma (Courtois, 2008; Courtois & Ford, 2009; Herman, 1992, 1997). Research results indicate that the neurofeedback practitioner is central to the treatment process, that practitioner therapeutic skills are crucial to positive neurofeedback outcomes, and that counseling and neurofeedback may effectively complement each other in trauma treatment.
DEDICATION

This dissertation is dedicated to my husband Mark, who endured long separations on different continents to that I could pursue my dream, and to my four grown children Madeleine, Grace, David, and Daniel. Thank you all for encouraging, challenging, and loving me through many circumstances and changes.
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I was never alone throughout the dissertation process, and I am grateful to the many people who have helped and encouraged me along the way.

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CHAPTER ONE
INTRODUCTION

Overview: Researcher Connection to the Topic

I have lived in Moscow, Russia for most of the past 18 years, during an unusual time of political upheaval and social change that has been sometimes dangerous and always unpredictable. I have experienced the murder of a friend; an attempted government coup and the ensuing martial law; numerous terrorist bombings in metro stations and shopping malls where my family and I routinely travel; and terrorist bombs planted in the basements of apparently random apartment buildings, precipitating the organization of neighborhood watches in some areas. In two separate events, terrorists held and subsequently murdered hostages in a popular city theatre as well as in a school located to the south of where my family and I lived.

As a staff member at an international school, I participated in meetings where we planned safe routes and safe houses for children in the event of a terrorist attack, and I watched as the windows of my office and the students’ classrooms were replaced with bullet-proof glass, by order of the American embassy. One evening I heard a loud blast, and my apartment shook. A short time later, my children arrived home to describe how they had seen city workers scraping human organs off the sidewalk, the results of a car bomb planted, as we later learned, in a turf war between rival factions of our neighborhood fruit and vegetable vendors. These events were in addition to the assaults, pick-pocketing, and unexpected exposure to dead bodies on the streets, occurrences often typical of life in a large city.

As I observed the impact of sustained stress, as well as sudden trauma, on individuals and families, I became interested in trauma treatments of all kinds. As I began reading about current neuroscience research on the impact of trauma on the mind and body (Herman, 1997; Rothschild,
2000), I became interested in investigating a wide range of treatment modalities that might prove to be effective in soothing the anxiety that generally typifies traumatic experience. In addition, my experience in clinical practice has involved counseling those who have experienced trauma of almost every variety: attachment traumas from having been placed in an orphanage, trauma from domestic violence, from all forms of abuse or neglect, from loss, from illness, from assault and violence of all kinds, from a countless myriad of events that stretch and sometimes overwhelm the human ability to cope.

All these experiences of trauma, both personal and vicarious, have provided the impetus to explore a wide variety of trauma treatments, including nonconventional treatment modalities that have the potential of reaching the areas deeper in the brain where, according to modern neuroscience research, trauma appears to alter the neurological systems by which the brain receives and processes information (van der Kolk, 2006). Neurofeedback is one of those treatment modalities. I became particularly interested in the neurofeedback alpha-theta protocol because it has the potential for reaching beyond cognitive functioning, to the seat of emotional reactions, including attachment (Smith, 2008; Trudeau, 2005; White, 2008). My own experience with trauma, in addition to my experience counseling those exposed to trauma, provided the impetus for this study.

Summary of Relevant Literature

Neuroscience, the mental health field, and the concept of trauma as an underlying factor in mental disorders have been inextricably linked since the inception of the mental health professions in the late 1800s, when physicians from the new professions of neurology and psychiatry studied the phenomenon of hysteria. One of those physicians was Sigmund Freud. Interest in the impact of trauma once again peaked during World War I, when the mental health
profession identified the disorder of combat neurosis, commonly called shell shock. At that
time, the clinical symptoms of posttraumatic stress disorder were described in Abram Kardiner’s
book *The Traumatic Neurosis of War*. In 1980, after the Viet Nam war, the impact of trauma
was officially recognized when the American Psychiatric Association included posttraumatic
stress disorder as a diagnostic category in the *Diagnostic and Statistical Manual of Mental
Disorders, III* (*DSM-III*, 1980). In addition, since the mid 1970s, the feminist movement has
raised public consciousness about the effects of interpersonal trauma (Herman, 1997). It is in the
context of research on interpersonal traumas that a second trauma construct, that of complex
trauma, or CPTSD, has gained recognition (Courtois, 2008; Courtois & Ford, 2009; Herman,

Through the use of various neuroimaging techniques, contemporary neuroscience
research has demonstrated the manner in which trauma impacts the brain at different stages of
human development. Trauma at any stage of life has the potential to change the way that the
brain receives and processes information (van der Kolk, 2006). However, traumatic experience
during the early developmental years has an especially powerful potential to impact all realms of
present and future human functioning, including the cognitive, affective, relational, and somatic
domains (Courtois, 2008; Ford, 2009; Perry, 2002b; van der Kolk, 2003). In particular, poor
emotional regulation due to overarousal of the limbic system results in limited problem solving
skills and inadequate relational abilities (Courtois, 2008; Ford, 2009; van der Kolk, 2003). In
addition, neuroscience research has provided an understanding of how the brain stores traumatic
memories (Rothschild, 2000), and based on these new discoveries, has indicated which
treatments may be most effective in treating trauma symptoms (van der Kolk, 2006).
Although traumatic experience has the potential to impact all realms of human functioning, studies also indicate that the brain possesses amazing plasticity and can therefore change in response to the environment (Charney, 2004; Hebb, 1949). Brain plasticity is the basis for neurofeedback training.

Neurofeedback is biofeedback applied to the brain and the central nervous system (Hammond, 2006). It has its foundations in neuroscience research as well as in data from clinical practice (ISNR, 2009). The majority of neurofeedback studies have utilized a quantitative methodology that indicates that neurofeedback is an efficacious treatment modality for a wide variety of symptoms including seizure disorders, attention deficit/hyperactivity disorder, and traumatic brain injury (Fox, Tharp, & Fox, 2005; Fuchs, et al., 2003; Gruzelier & Egner, 2005; Hirshberg, Chiu, & Frazier, 2005; Schoenberger, et al., 2001; Sterman & Egner, 2006; Sterman & Friar, 1972; Thompson & Thompson, 2005). Studies have also indicated that neurofeedback may be effective in treating the myriad of symptoms that may be associated with traumatic experience, such as affective disorders (Hammond, 2005a, 2005b; Saxby & Peniston, 1995), substance abuse (Kelley, 1997; Peniston & Kulkosky, 1989, 1991; Scott et al., 2005; Trudeau, 2000), posttraumatic stress disorder (Peniston & Kulkosky, 1991; Smith, 2008), somatic symptoms such as migraine headaches (Kropp, Siniatchkin, & Gerber, 2002; Stokes & Lappin, 2010), chronic fatigue syndrome (James & Folen, 1996), fibromyalgia (Mueller et al., 2001), and the sequelae of early childhood abuse and neglect (Huang-Storms, 2008).

Despite the fact that an abundance of studies indicate its efficacy, no known qualitative study has explored the factors that may contribute to that efficacy. Over a decade ago, Peniston (1998) posed a question concerning the numerous possible factors that may have contributed to the positive outcomes of his neurofeedback research studies. To date, no known study has been
designed to explore those factors in order to provide a model that might serve to increase the effectiveness of neurofeedback training.

On July 1, 2009, the counseling profession came full circle, back to the beginnings of the mental health professions, when the Council for Accreditation of Counseling and Related Educational Programs (CACREP) mandated new standards that call for the integration of disaster response, crisis intervention, and trauma knowledge into many of the required courses found in both the core curriculum and the specialty areas of CACREP accredited programs (CACREP, 2009). Since the topic of trauma is once again at the forefront of the counseling profession, it seems reasonable to research a wide variety of treatments. Neurofeedback is one of those treatments.

There is a paucity of qualitative research that explores the potential factors that may contribute to the positive outcomes indicated in the quantitative neurofeedback research outcomes, despite the fact that over a decade ago, Penison (1998) raised the question concerning confounding treatment variables in neurofeedback training. In addition, a large body of research exists on the factors that contribute to positive outcomes in traditional talk therapy (Horvath & Symonds, 1991; Jennings, Hanson, Skovholt, & Grier, 2005; Jennings & Skovholt, 1999; Skovholt, 2005; Skovholt & Ronnestad, 1992; Sexton & Whiston, 1994). Therefore, it would seem reasonable to explore factors that contribute to positive neurofeedback training outcomes in a parallel manner.

The purpose of this qualitative grounded theory study will be to explore the factors and processes that contribute to positive treatment outcomes when neurofeedback is used with individuals with trauma symptoms. Interviews with neurofeedback practitioners who have been nominated as experts by their peers will provide the data for this study.
Conceptual Framework

A conceptual framework is a description of the topic to be studied, including the purpose for, and the significance of, the study (Miles & Huberman, 1994). Using a qualitative grounded theory approach, this study will explore the factors and processes that contribute to positive outcomes when neurofeedback is used to treat clients with trauma symptoms. The impact and treatment of trauma has become an important topic in the mental health field, as the majority of adults (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and a substantial number of children (Costello, Erklini, Fairbank, & Angold, 2002) have experienced some type of trauma. The definition of trauma has been expanded to include not only the DSM-IV-TR (2000) description of events that may precipitate a diagnosis of posttraumatic stress disorder (PTSD), but also the construct of complex trauma, which can have a lasting deleterious impact on physical, emotional, and relational functioning (Courtois, 2008; Courtois & Ford, 2009; Herman, 1992, 1997; van der Kolk, 2005).

There is a qualitative gap in the research literature on neurofeedback. There have been numerous quantitative studies that have indicated that neurofeedback may be effective in treating a wide range of physical and emotional disorders (Fox, et al., 2005; Fuchs, et al., 2003; Hammond, 2005; James & Folen, 1996; Kropp, et al., 2003; Peniston & Kulkosky, 1999; Sterman & Friar, 1972; Sterman & Egner, 2006; Thompson & Thompson, 2005). There have been qualitative pieces within the quantitative studies, such as interviews with family members of research participants for the purpose of confirming the positive participant outcomes (Hammond, 2003; Peniston & Kulkosky, 1990; Saxby & Peniston, 1995). There are several qualitative studies that explore client experiences of neurofeedback training (Byrne, 2005; Monjezi, 2005; Parker, 2003; Parsons, 2008). There are also several opinion pieces written by
individual neurofeedback concerning its effectiveness (Trocki, 2006; White, 2008). However, there have been no known qualitative studies that specifically explore the factors that may help to bring about positive treatment outcomes from the viewpoints of multiple neurofeedback providers. More than a decade ago, Peniston (1998) posed the question concerning factors that influence positive treatment outcomes, including treatment protocols such as temperature training, visualizations, the actual neurofeedback, the therapist, placebo, and Hawthorne effects. Peniston’s question has yet to be explored, despite the fact that numerous quantitative and qualitative studies exist concerning the factors that influence treatment outcomes for traditional talk therapy (Horvath & Symonds, 1991; Hubble, Duncan, & Miller, 1999; Jennings & Skovholt, 1999; Sexton & Whiston, 1994).

Therefore, this study will supplement the quantitative research on neurofeedback by utilizing interviews with neurofeedback providers to provide the data to determine what factors and processes may be important for positive treatment outcomes when neurofeedback is used on individuals with trauma symptoms. Neurofeedback providers’ experiences and perceptions are relevant since clients share information about treatment outcomes with them that may not appear in pre-test and post-test studies.

Data from two neurofeedback practitioner semi-structured interviews and one email follow-up were analyzed with a grounded theory approach (Corbin & Strauss, 2008), and a potential model for effective treatment emerged from the data. This model has the potential to increase the effectiveness of neurofeedback providers, thereby more effectively helping clients to recover from trauma symptoms. It may later also be tested in subsequent research.
Rationale for the Study

There are many compelling reasons to expand the knowledge base concerning the impact and efficacious treatment of trauma. A majority of adults (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and a substantial number of children (Costello, Erklani, Fairbank, & Angold, 2002) experience trauma, as trauma takes many diverse forms that are deleterious to healthy functioning (Courtois, 2008; DSM-IV-TR, 2000). Of particularly pressing concern are the members of the military and their families, who appear to experience higher rates of psychological distress than the general population (Chartrand, et al., 2008; Department of Defense Task Force on Mental Health, 2007; Flake, et al., 2009; Hefling, 2009; Sogomonyan & Cooper, 2010), and at rates that have increased in children since 2003 (Hefling, 2009).

In addition, counselors are frequently impacted by trauma as they are regularly called upon to help with mental health needs in divergent crises and disasters (Beckett, 2009). In these situations they serve not only those affected by trauma first hand, but also those who help the victims; therefore, counselors may both experience trauma personally and counsel others who are affected by compassion fatigue and secondary trauma (McCann & Pearlman, 1990).

Lastly, the new CACREP standards, effective on July 1, 2009, require that teaching about trauma be infused into nearly every aspect of the counseling curriculum (CACREP, 2009). It is for all these reasons that a study of the experiences and perceptions of mental health professional neurofeedback providers who treat those exposed to traumatic events may contribute to the body of research on the effectiveness of various trauma treatments.
Research Questions

This study will explore the central research question, “What are the factors and processes that influence treatment outcomes when neurofeedback training is used to treat individuals with trauma symptoms?” In addition, the study will explore the following subquestions:

Subquestion 1: What are common trauma symptoms encountered by neurofeedback providers?

Subquestion 2: What outcomes have neurofeedback providers observed when treating individuals with trauma symptoms?

Subquestion 3: What is the process of neurofeedback training when treating individuals with trauma symptoms?

Subquestion 4: What is the role of counseling in neurofeedback training with individuals with trauma symptoms?

Subquestion 5: What are neurofeedback providers’ reflections about their experiences in providing neurofeedback training to those who have experienced trauma?

Subquestion 6: To what extent do multicultural factors influence treatment outcomes when neurofeedback is used to treat individuals with trauma symptoms?

Definition of Terms

The following are terms and definitions used in this study. The terms are defined according to their use in this research study.

Abreaction

An emotional release resulting from mentally reliving or bringing into consciousness, through the process of catharsis, a long-repressed, painful experience.
**Alpha Stim**

A device categorized under Microcurrent Electrical Therapy (MET), and FDA (Food and Drug Administration) approved to treat anxiety, depression, insomnia, and pain. It emits a current of electricity of less than one milliampere that normalizes the electrical activity of the brain and nervous system which can be measured by an EEG. It can be applied with small probes touching the body or through ear clips. When applied through ear clips, it is called Cranial Electrotherapy Stimulation (CES).

**Alpha-theta Protocol**

A neurofeedback technique, usually done with the eyes closed, in which theta brainwaves are rewarded, so that they cross over alpha brainwaves on an EEG screen. The goal of the alpha-theta protocol is to produce a state of deep relaxation, during which the brain may resolve traumatic memories.

**Awake State Training**

Neurofeedback training completed with the eyes open, in contrast to alpha-theta training, which is done with the eyes closed.

**Biofeedback**

A process that utilizes instruments to measure a person’s physiological processes, such as brainwaves, heartbeat, breathing, muscle activity, and skin temperature, so that the person can learn how to regulate these processes. The purpose of this learning process is to improve health and performance (International Society for Neurofeedback and Research Board of Directors, ISNR, April 2008).
Biofeedback Hand Warming (Peripheral Hand Warming)

A method used in biofeedback training to measure stress level through skin temperature, thereby helping a person to change stress level to meet the circumstances. The more stressed a person is, the lower the temperature in the hands, feet, and other extremities. The lower the stress level, the higher the temperature should be in the extremities. Hand warming may be used to treat migraine headaches, high blood pressure, insomnia, pain, stress, digestive disorders, and other disorders.

Complex Trauma

Sometimes also called complex posttraumatic stress disorder (CPTSD). This term refers to interpersonal trauma that generally, but not always, occurs in childhood, in the form of physical, emotional, or sexual abuse. Complex trauma may refer to the traumatic stressors, or the seven symptoms or posttraumatic stress reactions that are associated with the construct of complex trauma (Courtois, 2008; Herman, 1992, 1997).

Electroencephalography (EEG)

The recording of the brain’s electrical activity, obtained from multiple electrodes on the scalp. Brain waves recorded on the EEG can be analyzed for brain dysfunction.

Heart Rate Variability (HRV)

A technique in which a small electrode is attached to a person’s finger or ear in order to detect the heart’s signal. The heart’s electrical pattern is then displayed on the computer screen in real time. The person is guided to relax physically and emotionally, to alter negative or anxious thoughts, and to learn to breathe in a specific rhythmical pattern. This breathing pattern increases variability and smoothness in the heart rate pattern and leads to better management of stress on the body, brain and emotions.
LENS Neurofeedback

The acronym for Low Energy Neurofeedback System. This system utilizes a very low power electromagnetic field, similar to those that surround digital watches, to carry feedback to the person receiving it. Although the feedback signal is weak, it produces a measurable change in the brainwaves without conscious effort from the individual receiving the feedback. The goal is a changed brainwave state resulting in greater ability for the brain to regulate itself.

Mental Health Professional

A person licensed to provide mental health services. Mental health professionals may include counselors, psychologists, social workers, psychiatrists, and nurses with a specialty in psychiatric nursing.

Neurofeedback or Neurofeedback Training (NF or NFT)

A form of biofeedback that uses monitoring devices applied to the scalp, in order to provide information to individuals on the state of their physiological functioning. In contrast to biofeedback, neurofeedback focuses on the central nervous system and the brain. It is also sometimes called EEG biofeedback.

Neurofeedback Provider or Neurofeedback Practitioner

These two terms are used interchangeably in this document. Both terms refer to a person who provides neurofeedback training to clients. Neurofeedback providers receive specialized training in providing neurofeedback services, and are also licensed medical or mental health professionals or have a certification from the Biofeedback Certification International Alliance (BCIA).
Posttraumatic Stress Disorder (PTSD)

A diagnosis in the *DSM-IV-TR* (2000), listed in the section of anxiety disorders. The diagnosis is given when an individual has experienced a traumatic stressor and meets the criteria in the three diagnostic categories of reexperiencing, avoidance, and hypervigilance.

Quantitative EEG (qEEG)

A procedure that processes the recorded EEG activity from a multi-electrode recording using a computer. The processed EEG is commonly converted into color maps of brain functioning called “Brain maps.” The EEG and the derived qEEG information can be interpreted and used as a clinical tool to evaluate brain function and to track the changes due to various interventions such as neurofeedback or medication.

Roshi

A type of neurofeedback device developed from research on the brainwave patterns of Zen Buddhist meditation masters. Clients hear a tone when brainwave patterns will improve brain functioning, and the tone turns off when the level of the helpful brainwaves drops. The goal of the training is to keep the tone going over long periods of time. Over time, clients learn to control their brainwaves so that they no longer need the training.

Somatic Symptoms

Symptoms that are physical in nature, rather than mental or emotional.

Trauma

Psychological trauma, as opposed to physical injury. Trauma may refer to a stressful event, or a person’s response during or after a stressful event. Stressful events may also be called *psychological or psychic* trauma, or a *traumatic stressor*. The response to a traumatic stressor may also be called a *posttraumatic reaction or disorder* (Courtois & Ford, 2009).
**Wounded Healer**

Individuals whose personal experience of suffering is transformed into a constructive healing force for fellow sufferers. The wounded healer theme is found in literature across time and cultures, including the medical and mental health literature.

**Z Score Training**

A neurofeedback technique in which brainwave band characteristics are compared to the norms to give z-scores (standard deviations from the norm) for absolute power, relative power, power ratios, phase, coherence and asymmetry.

**Overview of Methodology**

A qualitative methodology with a grounded theory approach was used for this study. I used purposeful sampling with a nomination process in order to identify neurofeedback providers considered expert in treating individuals with trauma symptoms. The nomination process resulted in the identification of ten expert neurofeedback providers, nine of whom were licensed mental health professionals, and one of whom held certifications in biofeedback and neurofeedback. The initial contact consisted of a face to face semi-structured interview, with the exception of one Skype interview due to the geographical constraints. The second contact consisted of a semi-structured telephone interview, and the third contact was an email follow-up. A research team that included five doctoral students plus myself as the head researcher analyzed each transcribed interview and reached consensus on codes. In keeping with grounded theory, the resulting data was used to create a potential model for positive treatment outcomes.
Summary

In this chapter, I have stated my personal connection to the topic of trauma and provided an overview of all aspects related to this study. The literature indicates that neurofeedback is an effective intervention for numerous disorders, including symptoms that follow traumatic experience; however, no qualitative study exists that explores the nature of the factors and processes that contribute to positive treatment outcomes. Due to the paucity of qualitative research on neurofeedback, a qualitative research methodology with a grounded theory approach was most appropriate for this study. The purpose of the study was to explore the factors and processes that contribute to treatment outcomes when neurofeedback is used on individuals with trauma symptoms. The data gained from the interviews and written documents was coded by a research team of six doctoral students, including myself as the lead researcher, in order to identify salient themes. The themes were then used to create a potential model for increasing neurofeedback treatment effectiveness. A wide definition of trauma was used for this study, including the traumatic stressors posttraumatic reactions included in the in the *DSM-IV-TR* (2000) description of posttraumatic stress disorder, as well as the traumatic stressors and the seven posttraumatic reactions associated with complex trauma (Coutois, 2008; Courtois & Ford, 2009; Herman, 1992, 1997).
CHAPTER TWO
REVIEW OF THE LITERATURE

Introduction

From the official beginnings of the mental health professions in the late 1800s, to the newest standards in the counseling curriculum adopted in 2009 (CACREP, 2009), trauma has been an important topic of study and research in the mental health field, as it has been recognized as an underlying factor in many mental health disorders (Herman, 1992, 1997; Courtois, 2008). Just as trauma has been inextricably linked with the mental health profession since its beginnings, so neuroscience and trauma have also been linked, as neuroscience research has shed light on the manner in which traumatic experience impacts both the brain (Perry, 2002; van der Kolk, 2006; Wolf et al., 2009) and the body (Rothschild, 2000). Research has indicated that neurofeedback, based on neuroscience discoveries, may be an efficacious treatment modality for the myriad of symptoms that typically follow traumatic exposure (Huang-Storms, 2008; Smith, 2008). This literature review, divided into four parts, will explain how these topics are connected, and how they provide the background for this particular study of the factors and processes that contribute to positive outcomes when neurofeedback is used on individuals with trauma symptoms.

First, the literature review includes a brief history of the concept of trauma as it relates to mental health, a definition of trauma, and some statistics concerning its prevalence. The second section provides a brief history of neuroscience, and an explanation of how neuroscience research has provided an increased understanding of the impact of traumatic experience on human brain functioning. The third section provides a background of neurofeedback, a treatment modality based on neuroscience. This section will include a brief history of neurofeedback as well as a list of research studies that indicate that neurofeedback can be an efficacious treatment
for a wide variety of issues, including those that may be associated with trauma. This section also includes an explanation of aspects that are missing from the literature, in order to set the current study in the context of previous research, while providing a rationale for this particular study and method. The fourth section explains how the study of trauma, neuroscience, and neurofeedback are pertinent to the counseling profession.

Trauma

History of Trauma

Neuroscience, the mental health field, and the concept of trauma as an underlying factor in mental disorders have been inextricably linked since the inception of the mental health profession in the late 1800s, when Pierre Janet, William James, and Sigmund Freud, physicians from the new professions of neurology and psychiatry, visited the French neurologist Jean-Martin Charcot at his modernized hospital, Salpetriere, in order to view live demonstrations of the disorder called hysteria in women. Both Freud and Janet theorized that the disorder, which included both psychological as well as somatic symptoms, had its origins in previous traumatic experiences, and Freud speculated that the trauma was specifically sexual in nature. Janet never repudiated his theory concerning the connection between hysteria and traumatic experience. However, when Freud, pressured by public opinion, backed away from his prior assertion that women's hysteria was linked to sexual abuse, the concept of trauma as an underlying factor in mental disorders was, for the most part, set aside. It was not until World War I that the mental health profession once again identified trauma as a factor in mental health disorders (Herman, 1997).

During World War I, the disorder of combat neurosis, or "shell shock," once again brought the impact of psychological trauma to the consciousness of the mental health profession.
In 1941, Abram Kardiner, an American psychiatrist, published *The Traumatic Neurosis of War*, and later described the clinical symptoms of trauma as it is currently understood. However, it was not until after the Viet Nam war, when veterans became outspoken about their war experiences, that the mental health professions officially recognized the impact of trauma. In 1980, the American Psychiatric Association included posttraumatic stress disorder as a diagnostic category in the *DSM-III* (1980), the first time that trauma was officially recognized as a diagnostic category.

Since the mid 1970s, the feminist movement has brought the deleterious impact of trauma to the forefront of social issues by raising public consciousness about the effects of interpersonal trauma and the need to provide special services for victims of traumas such as rape, sexual exploitation, domestic violence, and child abuse of all kinds (Herman, 1997). It is in the context of research on these types of interpersonal traumas that the construct of complex trauma, otherwise known as CPTSD, or disorders of extreme stress, not otherwise specified (DESNOS) (Pelcovitz, et al., 1997) has gained recognition (Courtois, 2008; Herman, 1992, 1997).

**Definition of Trauma**

Psychological trauma is difficult to define, even in the professional mental health community (Courtois & Ford, 2009), because it tends to be subjective, existing on a wide continuum of circumstances that range from everyday stressful occurrences to life-threatening, life-altering, shocking events. This continuum includes factors such as the event’s “magnitude, complexity, frequency, duration, predictability, and controllability” (Weathers & Keane, 2007, p. 108). No clear boundaries exist to delineate everyday stressors from traumatic stressors. In addition, it is difficult to objectively define where an event falls on a traumatic stressor continuum, because a person’s degree of posttraumatic reaction to an event is also subjective,
depending on the personal meaning that an individual assigns to the event (Weathers & Keane, 2007).

Although psychological trauma has sometimes been described as an unusual occurrence, “outside the range of normal human experience” (DSM-III, 1980), current evidence indicates that a majority of adults (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and a substantial number of children (Costello, Erklini, Fairbank, & Angold, 2002) have experienced some type of trauma. The realization that most people will experience some form of psychological trauma during their lifetime has caused a shift in recent years to define trauma without any reference to its being a normal or abnormal experience (Courtois & Ford, 2009).

Furthermore, the use of the word trauma is often confusing, because it may refer to a stressful event, or a person’s response during or after a stressful event. Stressful events may also be called psychological or psychic trauma, or a traumatic stressor. The response to a traumatic stressor may also be called a posttraumatic reaction or disorder (Courtois & Ford, 2009).

Psychological trauma, as defined in the mental health professions, generally includes two broad constructs. Each construct has its own separate set of possible precipitating events, or traumatic stressors, and its own set of possible posttraumatic reactions, or symptoms, although these two constructs can, and often do, overlap in a person’s general functioning.

The first construct for psychological trauma comes from the Diagnostic and Statistical Manual of Mental Disorders, IV-TR (DSM IV-TR, 1980). This definition emphasizes a sudden, one-time catastrophic or extremely stressful precipitating event, and the posttraumatic reactions that may be associated with this type of event are used to diagnose posttraumatic stress disorder (PTSD). The second construct is that of complex trauma, also known as complex post-traumatic stress disorder (CPTSD), first described by Herman (1992, 1997), later expanded by Courtois
(2008), and sometimes also called “disorders of extreme stress not otherwise specified (DESNOS, Pelcovitz et al., 1997). This definition of trauma emphasizes traumatic stressors as being deleterious events that occur “repeatedly and cumulatively, usually over a period of time and within specific relationships and contexts” (Courtois, 2008, p. 86). The traumatic stressor as described in the construct of CPTSD is an ongoing trauma, such as is typical in situations of childhood abuse, neglect, abandonment, or domestic violence. The construct of CPTSD has undergone field trials for inclusion as a separate category in the DSM, and has received research attention during the last several decades. Interest in this construct has grown since mental health professionals have increasingly realized that some types of trauma are more complicated and have a more pervasive impact on a person’s cognitive, emotional, and social development, than the definition and corresponding symptoms included in the DSM-IV-TR (2000) for posttraumatic stress disorder would indicate (Courtois, 2008; Ford, 2005; Perry, 2002b; van der Kolk, 2003). The constructs of both posttraumatic stress disorder (PTSD) and complex trauma (CPTSD), with the corresponding symptoms or posttraumatic reactions, are described more fully in the following paragraphs.

**Posttraumatic stress disorder.** The first construct for psychological trauma was first included in the DSM-III in 1980, the first time that traumatic experience gained recognition as an official diagnostic category. This inclusion came as a result of the impact of the Viet Nam war on veterans, due in part to their political activism. This construct continues to be included in the DSM-IV-TR (2000), and its corresponding symptoms qualify an individual for a diagnosis of posttraumatic stress disorder. The DSM-IV-TR (2000) defines a trauma in the following manner:

The experience of an “an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to
one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate” (*DSM-IV-TR*, 2000, p. 463).

The individual who experiences this traumatic event generally responds with “intense fear, helplessness, or horror,” or in children, the response may be “disorganized or agitated behavior” (*DSM-IV-TR*, 2000, Criterion A2, p. 463). As a result of the trauma, three broad categories of symptoms are present for more than one month: persistent reexperiencing of the traumatic event in some form (Criterion B, p. 468), persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (Criterion C, p. 468), and persistent symptoms of increased arousal (Criterion D, p. 468). The *DSM-IV-TR* (2000) trauma construct tends to emphasize a traumatic stressor as being either a one-time specific event, or an event that takes place during a distinct time period, such as during a time of combat. Just as the trauma is more specific and confined to a distinct period of time, the symptoms of PTSD are also confined to the above three symptom categories of reexperiencing, avoidance, and increased arousal. The lifetime prevalence of PTSD is 8% in the general population (*DSM-IV-TR*, 2000).

**Complex trauma.** The impetus for the research on the construct of complex trauma came about as clinicians observed that many of the experiences and symptoms that their clients exhibited did not fit the construct of posttraumatic stress disorder. Complex trauma (CPTSD), although not yet included in the *DSM*, is the second construct that is gaining recognition in the mental health professions. This construct has sometimes also been called “disorders of extreme stress, not otherwise specified” (DESNOS; Pelcovitz et al., 1997).
Complex trauma is defined as a type of trauma that occurs “repeatedly and cumulatively, usually over a period of time and within specific relationships and contexts” (Courtois, 2008, p. 86). The traumatic stressor occurs over an extended period of time, and generally, but not always, during a child’s developmental years, in which a person is “entrapped and conditioned in a variety of ways” (Courtois, 2008, p. 86). This type of trauma may occur within the context of ongoing intimate relationships, as exemplified by domestic violence, child abuse of all types, or attachment traumas in which a caretaker’s response is either abusive or inadequate (Courtois, 2008; Ford, 2005; Perry, 2002b; van der Kolk, 2003). In these contexts, the main attachment figure, upon whom the child depends for survival, is also unpredictable and unsafe. Complex trauma may also result from situations such as combat; being held as a prisoner of war; being forced into refugee status, into being a prostitute, or into being a victim of human trafficking; or experiencing acute or chronic illness. Although the salient aspect of complex trauma is the ongoing nature of the trauma, a one-time catastrophe may also sometimes result in symptoms of complex trauma (Courtois, 2008). Although the situations that cause complex trauma are varied, the resulting symptoms fall into seven broad categories that may potentially impact the person in every area, including mentally, emotionally, socially, and physically. Complex trauma is more prevalent than generally recognized, and may impact between 1 in 7 or 1 in 10 children (Courtois & Ford, 2009).

Individuals who have experienced the type of ongoing, complex trauma, may exhibit the posttraumatic stress disorder symptom triad of reexperiencing, avoidance or numbing, and hyperarousal, as delineated in the *DSM-IV-TR* (2000); however, their symptoms frequently extend beyond this *DSM* triad, to include more enduring and pervasive changes in personality. The construct of CPTSD/DESNOS, described for a field trial in 1991 and 1992, included seven
areas that research has shown to be associated with early interpersonal trauma (Herman, 1992, 1997), including the following (Courtois, 2008, p. 88):

1. *alterations in the regulation of affective impulses*, including difficulty with modulation of anger and self-destructiveness. This symptom category can include various methods for emotion regulation and self-soothing, including addictions and self-harming behaviors;

2. *alterations in attention and consciousness*, leading to amnesia and dissociative episodes and depersonalization;

3. *alternations in self-perception*, such as a chronic sense of guilt and responsibility, and ongoing feelings of intense shame;

4. *alterations in perception of the perpetrator*, including incorporation of his or her belief system;

5. *alterations in relationship with others*, such as not being able to trust and not being able to feel intimate with others;

6. *somatization and/or medical problems*. These symptoms have been found to involve all major body systems;

7. *alterations in systems of meaning*, including feeling hopeless about finding anyone to understand them or their suffering, and may despair of ever being able to recover from their psychic anguish.

**Summary**

Trauma, once defined as an abnormal occurrence (*DSM-III*, 1980), is actually one that the majority of adults (Kessler, et al., 1995, and a substantial number of children (Costello, et al., 2002), will experience. The concept of trauma as an underlying factor in mental disorders has
been woven into the fabric of the mental health profession since its beginnings in the late 1800s (Herman, 1992, 1997), although interest in this concept has waxed and waned. There are currently two broad constructs that describe traumatic experience and traumatic reactions. One construct is found in the *DSM-IV-TR* (2000), emphasizes a traumatic stressor as being either a one-time event, or one that happens during a distinct time period, and the posttraumatic reactions are used to diagnose posttraumatic stress disorder. The second trauma construct is complex trauma (CPTSD), as defined by Herman (1992, 1997) and Courtois (2008), with its emphasis on ongoing deleterious acts of violence, entrapment, or inadequate care, over an extended time period. Traumatic reactions, or symptoms, may include the triad of reexperiencing, avoiding or numbing, and hyperarousal descriptive of PTSD, as listed in the *DSM-IV-TR* (2000), as well as the seven symptoms associated with complex trauma, or CPTSD (Courtois, 2008; Herman, 1992, 1997).

Freud, Janet, and Charcot, all neurologists, theorized that traumatic experience could potentially contribute to mental, emotional, and somatic symptoms in clients; however, they lacked modern knowledge of brain anatomy and neuroimaging equipment to prove how this phenomenon actually happened. Modern researchers have the knowledge and equipment that Freud and his colleagues lacked; they, therefore, have the capability of understanding more fully how traumatic stressors can alter the manner in which the brain operates, particularly if the traumatic event occurs during crucial periods of development (Ford, 2009; van der Kolk, 2006; Wolf, et al., 2009). The following section contains a brief history of neuroscience and a summary of current neuroscience research as it pertains to traumatic experience.
Neuroscience

History of Neuroscience

The study of neuroscience stretches back thousands of years, to the concept that there is a connection between a person’s head and behavior. Sometime between 460 and 379 B.C., Hippocrates hypothesized that the brain was the source of human intelligence. Rene’ Descartes (1596-1650) was the first person to assign a specific task to a specific part of the brain. After Anton Van Leeuwenhoek (1632-1723) invented the microscope, researchers discovered that different parts of the brain had different types of cells. In the late 1800’s, Franz Josef Gall and Johann Spurzheim proposed that every type of behavior could be traced back to a specific region of the brain, a theory that was later confirmed when a railroad construction worker was injured by a metal rod that pierced the frontal lobe on the left side of his head. After the wound healed, he was physically fine, but his personality underwent a severe change, from a polite, dependable, efficient worker, to a person who used foul language and could not hold a job. It was this accident that led to the discovery that brain cells in the frontal cortex somehow govern human behavior (Grosjean, 2005; Robbins, 2008).

Researchers subsequently discovered that the brain generates electricity and has its own electrical signature, as shown on the electrical encephalogram (EEG). In the 1880s, Santiago Ramon y Cajal, a Spanish anatomist, discovered the neuron, or brain cell, and described the process by which cells pass on nerve impulses through a kind of cable, or axon. He also discovered that, as a person learns new skills, the brain cells morph, or change, as they make new connections with other cells. Scientists later discovered that many brain functions are not the result of activity in just one part of the brain, but instead are governed by networks of sites,
which communicate by electrical impulses that communicate in split-second time. All these connections are central to how well the brain operates (Grosjean, 2005; Robbins, 2008).

In the late 1800s, John Hughlings, a British neurologist, proposed that the brain is organized in a hierarchical, "bottom up" manner, so that a person automatically responds to sensory input by activating emotional and arousal systems that can initiate action, if necessary. The action can also be modified by thought, or cognitive processes (Perry, 2002a; Perry, 2002b; van der Kolk, 2006).

**Brain Structure and Normal Development**

Neurologists have subsequently called these brain layers, first proposed by Hughlings (van der Kolk, 2006), the brain stem and midbrain, the limbic system, and the cortex. The most basic brain level is the brain stem and midbrain, sometimes called the reptilian brain, because it regulates fundamental biological functioning, such as heart rate and respiration (Perry, 2002a). Although the brain stem must be mature at birth, in order for a newborn to survive, other parts of the brain develop later. In fact, the brain is one of the most immature of all human organs at birth (Rothschild, 2000).

The middle layer, the limbic system, regulates the autonomic nervous system, including the smooth muscle responses to stress and relaxation, sexual response, and the traumatic stress reactions of fight, flight, or freeze (Perry, 2002a; Rothschild, 2000). The limbic system contains the hypothalamus, which is responsible for maintaining body temperature; essential nutrition and hydration; and rest and balance. The limbic system also houses two almond-shaped lobes, the hippocampus and the amygdala, both of which are important to understanding how memory is stored, since they are essential to processing information on the way from the body to the cerebral cortex (Rothschild, 2000). The amygdala processes and then helps to store emotions
and reactions to emotionally charged events. The hippocampus helps to put those events in a life timeline of past, present, and future. Because the hippocampus matures between 2 to 3 years of age, children do not generally remember facts or events before that time; however, since the amygdala is mature at birth, it is ready to process emotions and sensory experience, to be stored in the cortex (Rothschild, 2000). This fact means that, although young children may be too young to store a specific event in cognitive memory, they can implicitly store the emotions and sensations associated with that event (Grosjean, 2005; van der Kolk, 2003). This fact explains how some of the enduring patterns of attachment can occur at early ages (Bowlby, 1982, 1988), even though a child has no clear memories of specific events.

Mature and adequate functioning of both the amygdala and hippocampus are necessary for sufficient processing of life’s events, especially the stressful ones (Rothschild, 2000). A good caregiver acts as neurofeedback for an infant, soothing emotions and acting as a calming agent, while both the amygdala and the cortex mature, when the child has the capacity for self-regulation (van der Kolk, 2006). Parental soothing is crucial to subsequent affect regulation (Wolf, et al., 2009).

The cerebral cortex is responsible for the higher brain functions of abstract and concrete thought, problem solving skills, speech, and semantic and procedural memory (Perry, 2002a; Rothschild, 2000). Each brain layer is built on the basic safety and “needs met” functioning of the previous layers; in order for the higher layers to function effectively, the needs of the previous layer must be met. If children have had the basic safety and nurture needs met of the first two layers, they are free to explore and to acquire new knowledge, thereby making new neuronal brain connections. Some researchers have used the term the “learning brain” to describe the child’s brain that develops along this normal course (Ford, 2009).
The Impact of Trauma on the Brain

Discoveries in the field of neuroscience have shed light on how traumatic stressors impact brain function, particularly if the traumatic events occur at crucial stages of development (Courtois & Ford, 2009; Perry, 2002b; van der Kolk, 2006; Wolf, et al., 2009). The following is a description of how traumatic stressors may impact the brain.

**Childhood trauma.** Adverse interpersonal traumas in early childhood, otherwise known as "developmentally adverse interpersonal trauma" (DAIT; Ford, 2005, p. 410) may be any number of deleterious experiences, including “sexual, physical, and emotional abuse, abandonment by caregiver(s), chronic and severe neglect, domestic violence, or death or gruesome injuries as a result of community violence, terrorism, or war” (Ford, 2005). When a child experiences interpersonal traumas in early childhood, the brain changes from a “learning brain” to a “survival brain” (Ford, 2009), ever on high alert, overreactive, and unable to adequately regulate emotional arousal. This fundamental change impacts all areas subsequent development, including the following: “[1] attention and learning; [2] working (short-term), declarative (verbal), and narrative (autobiographical) memory; [3] emotion regulation; [4] personality formation and integration; and [5] relationships (attachment)” (Ford, 2009, p. 31). This change from the “learning brain” to the “survival brain” (Ford, 2009) puts the child at risk for developing symptoms of complex trauma later in life, as the neurological changes during crucial times of development impact all major areas of development and learning. These symptoms encompass all areas of functioning, including cognitive, emotional, somatic, and relational (Courtois, 2008; Ford, 2005; van der Kolk, 2003).

Ongoing traumatic stressors in childhood result in persistent overarousal in the limbic system (Ford, 2005; Perry, 2002b). This persistent arousal results in poor emotional regulation,
as well as underdevelopment in the cortex, so that the person may lack adequate problem-solving skills (van der Kolk, 2006). Inadequate emotional regulation and the inability to moderate emotional responses with cognitive reasoning produces a tendency toward behavior problems and troubled interpersonal relationships. In addition, if the traumatic stressor involves a primary caretaker or other trusted figure, the child develops the emotional confusion of needing to depend on an attachment figure who is unsafe and unpredictable (Courtois, 2008).

**Neuroscience research.** Using modern neuroimaging techniques, neuroscience research has shed light on the sequential chain of events, from the occurrence of a traumatic stressor, to neurobiological changes in the brain, to the symptoms of re-experiencing, attention problems, and hyperarousal typical of PTSD (van der Kolk, 2006). It also indicates how traumatic experience becomes encoded in the limbic system, causing the ensuing symptoms of complex posttraumatic stress disorder, when a childhood traumatic stressor is ongoing (van der Kolk, 2003).

An early study used neuroimaging techniques to track neurobiological changes in the brain of a subjects exposed to a reminder of a traumatic event (Rauch, et al., 1996). Results indicated that, when exposed to traumatic reminders, subjects exhibited increased blood flow in the right medial orbitofrontal cortex, insula, amygdala, and anterior temporal pole; at the same time, they exhibited decreased activity in the left anterior prefrontal cortex, particularly in Broca’s area, the center that regulates expressive speech, the ability to communicate thoughts and feelings (van der Kolk, 2006). Subsequent research confirmed that, when people are reminded of a traumatic stressor, their brain increases activity in areas that support intense feelings, and decreases activity in areas that inhibit feelings and that aid in verbally expressing feelings about the experience (Hull, 2002; van der Kolk, 2006). This fact may explain why
people exposed to trauma, especially during childhood, often have trouble labeling their feelings (Hull, 2002).

In addition, various research studies have confirmed that the hippocampus of individuals with PTSD tends to be smaller than in individuals in the general population (Hull, 2002; Rothschild, 2002), meaning that the individual may have a diminished capacity to properly evaluate the memory and to store the traumatic memory in narrative form. Instead, the memory stays perpetually in the present, ready to be triggered at any moment (Rothschild, 2002).

Neuroscience research findings suggest that sensory input may automatically activate areas of the brain associated with attention and memory, with the result that trauma survivors are prone to react to situations with irrational, and potentially harmful reactions, due to the fact that the reaction originates in the subcortical limbic system, which overrides or hijacks the rational cortex (Perry, 2002b; van der Kolk, 2006). The strength of the connection between the limbic system and the cortex remains unclear; however, some research indicates that the connection that flows from the amygdala to the cortex may be stronger than the connection that flows from the cortex to the amygdala (Amaral, Price, Pitkanen & Carmichael, 1992). Therefore, the cortex may not be optimally effectual for modifying emotional responses (van der Kolk, 2006).

Clinical Implications

Neuroscience findings have important implications for the mental health professions. Since there may not be a strong connection between the subcortical, emotional areas and the cortical, rational areas of the brain (van der Kolk, 2006), trauma survivors may have limited control over automatic responses that originate in the subcortical regions. Therefore, therapy techniques such as cognitive behavior therapy and psychodynamic therapy, both of which depend on insight and understanding to modify behavioral and emotional responses, may not be
optimally effective for treating individuals with trauma symptoms (van der Kolk, 2006). "The rational, executive brain, the mind, the part that needs to be functional in order to engage in the process of psychotherapy, has very limited capacity to squelch sensations, control emotional arousal, or change fixed action patterns" (van der Kolk, 2006, p. 1298). Therapies that address physical sensations and action patterns may be more effective for treating trauma survivors than those that are limited to insight and understanding. These therapies may include those that incorporate mindfulness, such as in Dialectical Behavior Therapy (DBT), as well as non-Western techniques such as yoga, that use physical movement and breath (van der Kolk, 2006). Although neurological patterns tend to become fixed, studies from the past 50 years have also indicated that the brain is a flexible organ whose complex circuitry can be altered by environmental factors (Charney, 2004; Hebb, 1949; Morris et al., 2003). The ability of the brain to change is the basis of neurofeedback training.

Summary

Neuroscience research suggests that traumatic stressors have the potential to alter typical brain functioning (Ford, 2009; Perry, 2002b; van der Kolk, 2006). In contrast to previous belief that the brain is a rigid structure, current neuroscience research points to the brain’s plasticity, or ability to change in response to various kinds of environmental interactions (Charney, 2004; Hebb, 1949). Neurofeedback provides a way to train the brainwaves so that the brain can learn to regulate its relaxation and arousal states (Othmer & Othmer, 2009). In addition, the alpha-theta neurofeedback protocol has the potential to impact the subcortical layers of the brain where traumatic memories are stored, in order to facilitate the processing of those memories. For these reasons, neurofeedback is a potentially efficacious trauma treatment that may be used either as a
stand-alone technique, or in combination with other treatment modalities (Masterpasqua & Healey, 2003). The following section will provide a review of the literature on neurofeedback.

Neurofeedback

History

Neurofeedback, or biofeedback applied to the brain (Hammond, 2006), has its foundations in neuroscience research as well as in data from clinical practice (ISNR, 2009). In contrast to biofeedback, which focuses on physiological functioning, neurofeedback focuses on the central nervous system and the brain (ISNR, 2009). The basis for neurofeedback training is the brain’s electrical nature, which allows brain cells, or neurons, to communicate; and its ability to self-regulate (ISNR, 2009). At the level of the neurons, the goal of neurofeedback training is to increase the brain’s stability and flexibility, meaning its ability to maintain arousal or relaxation states, as well as move back and forth between these states, as needed. The ability to either maintain, or to move back and forth between states, is the skill of self-regulation (Othmer & Othmer, 2009).

Neurofeedback can be traced back to the research of Sterman and his colleagues who used the brain’s electrical fingerprint, as measured by the electroencephalogram (EEG), to track the brain’s activity in cats and rhesus monkeys (Clemente, Sterman, & Wyrwicka, 1964; Roth, Sterman, & Clemente, 1967; Sterman, 1981). The researchers discovered that one could actually condition the brain to increase its frequencies in the 12 to 15 Hz range, measured in the sensorimotor cortical area. This research indicated that the brain could be trained to regulate itself (Robbins, 2008; Roth, Sterman & Clemente, 1967). Sterman and Friar (1972) subsequently used the research on animals to successfully treat a human subject with a seizure disorder.
At approximately the same time that Sterman demonstrated that brain frequencies in the 12 to 15 Hz range could be increased by training, Kamiya (1969) similarly reported that brainwaves in the alpha range of 8 to 11 Hz range could be increased through feedback. Sterman and Friar’s research on seizure disorders (1972) subsequently led to the first research studies on the effectiveness of neurofeedback training on attention deficit/hyperactivity disorder (Lubar & Shouse, 1976). After these early studies in the 1960’s and 1970’s, other researchers continued to study the effectiveness of neurofeedback on a wide variety of symptoms. The following is a summary of the research.

Research Summary

**Somatic symptoms.** Studies have indicated that neurofeedback can effective in treating a wide range of physical symptoms. Sterman’s (2000) review of the literature on seizure disorders showed that, overall, 82% of individuals with the most severe, uncontrolled seizures experienced a significant decrease in seizure frequency after neurofeedback treatment, with a 70% average decrease in seizures. A controlled study (Kotchoubey et al., 2001) confirmed that neurofeedback is effective, when compared with medication and placebos (Hammond, 2005). Several studies have indicated that neurofeedback can be effective in alleviating migraine headaches in both adults and children (Kropp et al., 2002; Siniatchkin et al., 2000; Stokes & Lappin, 2010). In addition, studies have indicated that neurofeedback may be effective in alleviating the symptoms of traumatic brain injury, including depression and fatigue, and increasing cognitive, occupational, and social functioning (Schoenberger et al., 2001).

In a case study on the effects of neurofeedback training on chronic fatigue syndrome, the subject’s Full Scale IQ increased one full standard deviation on the WAIS-R, and the client reported a decrease in the mental fog and confusion typical of chronic fatigue (James & Folen,
1996). Mueller et al. (2001) reported that neurofeedback training on 30 clients with fibromyalgia resulted in decreases in pain intensity and medication use, improvements in cognitive processing, mood, and sleep regulation, and a 50% rate of termination of disability status and re-employment.

**Attention deficit/hyperactivity disorder.** Several studies followed the early research of Lubar & Shouse (1976) on the effectiveness of neurofeedback on symptoms of attention deficit/hyperactivity disorder (AD/HD). A study by Monastra (2002) indicates that neurofeedback may be more effective than ritilin in decreasing symptoms of AD/HD, with the added benefit that the neurofeedback participants did not have to remain on medication for continued benefit from the treatment. One study (Fuchs et al., 2003) found that 20 hours of neurofeedback training (40 sessions of 30 minutes each) relieved AD/HD symptoms as effectively as ritilin. Another study indicated that the same results could be achieved with 10 hours of neurofeedback, or 20 sessions of 30 minutes each (Rossiter & LaVaque, 1995).

**Peak performance.** Studies on the effectiveness of neurofeedback on AD/HD symptoms indicated that neurofeedback training could be effective in decreasing hyperactive behavior and increasing sustained attention. These studies led to research on how neurofeedback training might enhance peak performance, or the cognitive performance of healthy individuals. In one study, music students were trained in ten 15-minutes sessions to increase beta brain waves. After 10 sessions of training, the students demonstrated significant reduction in commission errors on a continuous performance test, given before and after the neurofeedback training. This study provided the first evidence for the effectiveness of neurofeedback on performance enhancement training (Gruzelier & Egner, 2005).
Depression. A sizeable body of research indicates that depression is often associated with a pattern of asymmetry between the brain's left and right prefrontal cortex (Davidson, 1998a; Davidson, 1998b). The implication of this pattern is that the individual with this prefrontal asymmetry is less in touch with positive, approach behaviors and motivation from the left side, and more in touch with negative, withdrawal behaviors from the right side (Henriques & Davidson, 1991; Hammond, 2005a; Hammond, 2005b).

Various protocols for correcting this asymmetry are described by Hammond (2005b). In 1 to 5 year follow-ups, Baehr (2001) reported that clients maintained the changes that occurred during neurofeedback treatment for depression symptoms, and that the frontal alpha asymmetry that had been eliminated as a result of the neurofeedback treatment did not return. In contrast to this finding, several studies have indicated that, although depression symptoms tend to remit during pharmacological treatment, the frontal alpha asymmetry remains, so that the individual is still left vulnerable to future depression (Hammond, 2005b).

Hammond (2005a; 2005b) also reported on neurofeedback training for depression in which 77.8% of nine participants classified as severely depressed made significant improvements, as measured by pre and post-testing with the MMPI. Many of the participants who were taking prescription medication at the start of the study no longer needed it at the end of the neurofeedback training. Neurofeedback training not only lessens depression symptoms that may have been resistant to medication, but also tends to lessen anxiety and anxious rumination as well as withdrawal and introversion, while at the same time increasing ego strength. These results are a consequence of increasing frequencies in the left prefrontal, the approach motivation area, and decreasing activity in the right, the withdrawal and introversion area (Hammond, 2005b).
A more recent study by Smith (2008) included 10 participants diagnosed with PTSD who also demonstrated symptoms of depression and diminished capacity for attention. Participants were given 10 sessions of neurofeedback awake state training followed by 20 sessions of alpha-theta training, described in the substance abuse section. Research outcomes indicated by pre and post-testing using the Hamilton Depression Rating Scale and the Test of Variables of Attention (TOVA) indicate a significant decrease in depression symptoms as well as a significant increase in ability to sustain attention.

**Anxiety.** A literature review by Moore (2000) included 14 studies of the effects of neurofeedback on the anxiety disorder spectrum, including eight studies of neurofeedback on generalized anxiety disorder (GAD), three on phobic anxiety disorder, two studies on obsessive-compulsive disorder, and one report on post-traumatic stress disorder (PTSD). Even though some of the GAD studies used a briefer than normal course of treatment (Hammond, 2005b), seven of the eight GAD studies documented positive clinical changes in anxiety symptoms.

Peniston & Kulkosky (1991), using neurofeedback with the alpha-theta protocol that they had previously developed with a substance abuse population, conducted a study of neurofeedback effectiveness at a veterans medical center. For the study, 29 randomly selected Viet Nam veterans with a 12 to 15 year history of chronic PTSD were randomly divided into a neurofeedback group (N=15) and a control group (N=14). All 29 participants and their informers (family members) were contacted on a monthly basis after the treatment ended. Participants and family members reported that 30 months after treatment had ended, all of the control group veterans had relapsed and had been hospitalized again, compared to only 3 of the 15 neurofeedback participants. All of the neurofeedback participants had decreased their medication dosages, while only one patient in the control group had decreased medication
requirements, two reported no change in medication levels, and 10 had increased their medication needs. In addition, the neurofeedback group demonstrated improvement on 10 clinical scales on the MMPI, compared to those in the traditional group, who demonstrated significant improvement on one clinical scale.

Hammond reports treating three cases of obsessive-compulsive disorder successfully, with long-term follow-ups showing sustained improvement, when neurofeedback training was individualized (Hammond, 2003, 2004, 2005). In one study (2003), client scores on the Yale-Brown Obsessive-Compulsive Scale (YBOCS) showed 3.7 and 3.0 standard deviations of improvement. These improvements were also documented on the Minnesota Multi-Phasic Inventory (MMPI), as well as follow-ups 13 and 15 months after treatment ended, and confirmed by interviews with family members.

**Substance abuse.** In 1989, while working at the Veteran’s Administration Hospital in Colorado, Peniston published one of the first research studies documenting the effectiveness of neurofeedback on substance abuse issues (Peniston & Kulkosky, 1989). The specific protocol used in the study, later named the Peniston protocol, combined biofeedback handwarming with 10 sessions of awake state neurofeedback training and 20 sessions of deep state alpha-theta training. In this particular study the experimental group consisted of 30 men, 20 of whom were identified as severe alcoholics with a record of at least four previous admissions for alcoholism treatment, and an average of 20 years of alcohol dependence. Peniston’s control group consisted of ten other men. Post-testing at the end of the study revealed that the experimental group was able to significantly increase alpha and theta, compared with the control group, and also demonstrated significantly lower scores on the Beck Depression Inventory (BDI) (Peniston & Kulkosky, 1989).
A separate data analysis of the same study revealed that the experimental group also demonstrated significant positive changes on the Millon Clinical Multiaxial Inventory (MCMI) and the Sixteen Personality Factor questionnaire (16PF) (Peniston & Kulkosky, 1990). Thirteen months later, a follow-up revealed that a significant number of the experimental group continued to be in remission, compared to only two men in the control group. Menninger Clinic staff verified these results by speaking personally with the experimental group members and families. Subsequent follow-up studies continued to indicate high rates of remission in the experimental group, as compared with the control group.

Alpha-Theta training, generally done with the client’s eyes closed, is used to induce relaxation and resolve traumatic memories. It involves increasing theta brainwaves (4-8 Hz) over alpha brainwaves (8-12 Hz), which are generally more dominant, so that at “the crossover,” a state of deep relaxation occurs. The increase in theta over alpha creates a relaxed, peaceful state, with a decrease in anxiety and physiological arousal, resembling a state of meditation.

Additional studies on the effect of neurofeedback combined with deep state alpha-theta training for substance abuse issues also indicate positive results. Peniston utilized the alpha-theta protocol in a study on 14 men and women with an average of 17 years alcohol dependence, plus symptoms of depression, with the results that 21 months later, 13 of the 14 were still in remission (Saxby & Peniston, 1995).

Kelley (1997) used Peniston’s alpha-theta protocol in a culturally sensitive manner for 19 Dine’ (Navajo) Native Americans in a residential alcohol treatment center. In order to make the neurofeedback culturally congruent, the written proposal was read and blessed by a Navajo medicine man; Navajo metaphors such as eagles, and music such as flute recordings were used; rooms were decorated to indicate a healing environment. Participants received 40 neurofeedback
sessions as an adjunctive treatment during their 33 day stay at the treatment center. A three-year follow-up showed that, according to DSM-IV criteria, 4 participants (21%) remained in sustained partial remission from alcoholism, 12 participants (63%) continued in sustained full remission from alcoholism, and 3 participants (16%) remained classified as alcohol dependent.

A study by Scott (2005) yielded positive results from using a neurofeedback alpha-theta protocol on individuals addicted to substances. Researchers modified the Peniston protocol by eliminating the initial hand warming training. The modified protocol was then used to treat multiple substance users at Cri-Help Los Angeles, a long-term residential treatment center with mostly minority or homeless residents. The protocol consisted of an average of 13 sessions of SMR (sensory motor rhythm) training to normalize AD/HD symptoms, followed by 30 alpha-theta neurofeedback sessions. A year later, 77% of those in the experimental group remained in remission from substance abuse, compared with 44% of those in the control group (Scott et al., 2005). Three years later, an unpublished follow-up revealed that the control group had more substance abuse relapse, while the experimental group sustained their remission (Trocki, 2006).

Less encouraging results were reported by Burkett (2006) in a study using a neurofeedback and alpha-theta protocol with individuals at a faith-based residential treatment center for individuals addicted to crack cocaine. Most participants were unemployed and homeless at the beginning of treatment. The MMPI-2 and the Integrated Visual and Auditory Continuous Performance Test (IVA) were used as pre and post-testing measures. Although the post-test scores for the experimental neurofeedback group indicated more improvement than the control group on both measures, these differences were not statistically significant. (Burkett, 2006). Burkett discusses possible limitations to the study being that the MMPI-2 was normed on a Caucasian population in contrast to the majority non-Caucasian population at the shelter. In
addition, the religious nature of the shelter could have made many items on the MMPI-2 non-applicable to shelter residents.

Summary

Although more high quality studies are needed on the effects of neurofeedback, the body of research so far suggests that neurofeedback holds promise as a viable treatment modality for a wide range of psychological and somatic symptoms, some of which can be associated with trauma. Some of these disorders include migraine headaches (Kropp, et al., 2003), seizure disorders (Sterman & Friar, 1972; Sterman & Egner, 2006), chronic fatigue syndrome (James & Folen, 1996), attention deficit/hyperactivity disorder (Fox, Tharp, & Fox, 2005; Fuchs, et al., 2003; Thompson & Thompson, 2005), and the depression and anxiety disorder spectrum (Hammond, 2005), including obsessive compulsive disorder, and posttraumatic stress disorder (Smith, 2008). In several studies, neurofeedback has been found to be as effective as medication in alleviating symptoms, without the side effects that medications often have (Fox, et al., 2005). Neurofeedback is particularly appealing since it is non-invasive and rarely produces even mild side-effects.

Of particular interest is the use of the neurofeedback alpha-theta protocol in treating addictive disorders, which are frequently associated with some form traumatic experience (Peniston & Kulkosky, 1999; Trudeau, 2000; Trudeau, 2005; White, 2008). These research studies have indicated that neurofeedback may be an efficacious treatment modality for a wide range of mental health disorders, including those that often follow traumatic experience. In fact, Frank H. Duffy, Professor and Pediatric Neurologist at Harvard Medical School, has stated that neurofeedback "should play a major therapeutic role in many difficult areas. In my
opinion, if any medication had demonstrated such a wide spectrum of efficacy it would be universally accepted and widely used” (p. v). “It is a field to be taken seriously by all” (p. vii).

In contrast to the many quantitative studies indicating the effectiveness of neurofeedback, there is a paucity of qualitative studies that explore the factors and processes that contribute to positive treatment outcomes. Several phenomenological qualitative studies describe client experiences after neurofeedback training for autism spectrum, children with special needs, and functional adults (Byrne, 2005; Parker, 2003; Parsons, 2008). In addition, using a case study approach, one qualitative study describes the impact of neurofeedback on the quality of life in diabetic participants (Monjezi, 2005).

In addition, the literature contains several other qualitative pieces on neurofeedback, including an editorial by Duffy (2000) describing the potential effectiveness of neurofeedback and calling for more high quality research; an editorial by Trocki (2006) describing the barriers to widespread neurofeedback use; a clinician opinion article by White (2008) describing the effectiveness of the alpha-theta protocol; and an article by Masterpasqua and Healey (2003) encouraging therapists to consider the incorporation of neurofeedback into their therapy practices. However, the literature contains no known studies with a grounded theory approach that seek to explore multiple provider experiences, with the important goal of guiding clinical practice.

In contrast to the lack of qualitative studies on factors that contribute to positive outcomes using neurofeedback, there is a well-developed body of literature on the factors that contribute to positive treatment outcomes in traditional talk therapy (Horvath & Symonds, 1991; Jennings, Hanson, Skovholt, & Grier, 2005; Jennings & Skovholt, 1999; Skovholt, 2005; Skovholt & Ronnestad, 1992; Sexton & Whiston, 1994). These factors include the person of the
therapist and the therapeutic alliance. In 1998, Peniston stated that there are confounding treatment effects in the quantitative studies on neurofeedback training, a statement that bears further exploration. To date, there has been no parallel qualitative study in the neurofeedback sphere, as in the traditional talk therapy sphere, to explore the factors that contribute to positive treatment outcomes.

**Trauma, Neuroscience, and the Counseling Profession**

Neuroscience, the mental health field, and the concept of trauma as an underlying factor in mental disorders have been linked since the beginnings of the mental health professions in the late 1800s, but mental health professionals have, at various points in history, seemingly set aside the importance of this connection. On July 1, 2009, the counseling profession came full circle, back to the roots of the mental health professions, when the Council for Accreditation of Counseling and Related Educational Programs (CACREP) mandated new standards that call for the integration of disaster response, crisis intervention, and trauma knowledge into many of the required courses found in both the core curriculum and the specialty areas of CACREP accredited programs (CACREP, 2009). Since the impact of traumatic experience on the individual has been a continued topic of research and since counselor education programs are now mandated to educate counselors in the area of trauma, the counseling profession must also stay current on research on effective trauma treatments. Neuroscience research indicates that the human neurological system is dramatically impacted by traumatic experience; however, the research also indicates the brain’s plasticity, the ability to change. The brain’s plasticity indicates that brain waves may be retrained for better functioning after the experience of trauma.
Summary

Trauma and neuroscience have been linked since the beginning of the mental health professions. According to modern neuroscience research, traumatic experience changes the natural development of the neurological system; however, research also indicates the brain's plasticity or ability to change in response to environmental factors. Neurofeedback, or biofeedback applied to the brain and central nervous system, can assist the brain to achieve greater flexibility and stability. A growing body of research has indicated that neurofeedback may be an efficacious treatment modality for many disorders (Fox, Tharp, & Fox, 2005; Fuchs, et al., 2003; Kropp, et al., 2003; Thompson & Thompson, 2005), including those frequently associated with trauma (Hammond, 2005; Huang-Storms, 2008; Peniston & Kulkosky, 1999; Smith, 2008; Trudeau, 2000; Trudeau, 2005; White, 2008). Most of these studies have utilized a quantitative methodology in order to assess the effectiveness of neurofeedback on a variety of presenting problems in clients. In contrast to the well-developed body of literature on factors that contribute to positive outcomes using traditional talk therapy, there has been no parallel study to explore the potential factors and processes that contribute to positive outcomes using neurofeedback. Peniston (1998) stated that there are numerous confounding factors that contribute to positive neurofeedback outcomes; however, no known qualitative study has explored those factors. Therefore, the purpose of this grounded theory study will be to explore the factors and processes that contribute to positive outcomes when using neurofeedback with individuals with trauma symptoms.
CHAPTER THREE

METHODOLOGY

Introduction

Trauma, mental health, and neuroscience have been linked since the official beginnings of the mental health professions in the 1800s. Numerous quantitative research studies have indicated that neurofeedback may be an efficacious treatment modality for a wide variety of symptoms (Fox, Tharp, & Fox, 2005; Fuchs, et al., 2003; Gruzelier & Egner, 2005; Hirshberg, Chiu, & Frazier, 2005; Schoenberger, et al., 2001; Sterman & Egner, 2006; Sterman & Friar, 1972; Thompson & Thompson, 2005). Research has also indicated that neurofeedback may be effective in alleviating symptoms associated with both posttraumatic stress disorder as well as the myriad of symptoms that often follow more extended traumatic experiences such as childhood abuse and neglect (Hammond, 2005a; Huang-Storms, 2008; James & Folen, 1996; Kelley, 1997; Kropp, Siniatchkin, & Gerber, 2002; Mueller, et al., 2001; Peniston & Kulkosky, 1991; Scott et al., 2005; Smith, 2008; Stokes, 2010; Trudeau, 2000).

As indicated in the previous chapter, the literature contains few qualitative studies on neurofeedback, and no known studies that explore the factors that contribute to its effectiveness, as indicated by the quantitative research. Over a decade ago, Peniston (1998) commented on the numerous confounding factors that may contribute to positive neurofeedback outcomes. This qualitative study is designed to explore those factors so that a potential model for positive outcomes may emerge from the data.

Given the paucity of research on the factors and processes that may contribute to neurofeedback treatment outcomes, a qualitative approach was most appropriate for this study. Since the variables that contribute to treatment outcomes have not yet been researched and
identified, a quantitative study that tests specific variables could narrow down the possible factors prematurely, thereby eliminating some potentially important information. Therefore, in order to facilitate an in-depth exploration of as many factors as possible that contribute to treatment outcomes, I chose a qualitative research methodology. Of the qualitative research traditions, I chose a grounded theory approach so that the factors and processes identified from this study could be organized into a potential model for effective neurofeedback treatment. For this exploratory study, I conducted two semi-structured interviews and one email follow-up with ten neurofeedback providers who were nominated by their peers as being effective in providing neurofeedback training to those with trauma symptoms.

Although neurofeedback originated in the experimental traditions of psychology (Nowlis & Kamiya, 1970; Sterman & Friar, 1972), and is based on brain wave operant conditioning (Othmer & Othmer, 2009), its use is also consistent with counseling practice. Both counseling and neurofeedback have their origins in a strength-based, non-medical model. The foundation of counseling practice is the belief in the strength-based, innate human ability to adapt and find a healthy life balance, given appropriate help when needed; the foundation of neurofeedback training is the scientific evidence of the brain’s plasticity and ability to adapt, given the appropriate training (Othmer & Othmer, 2009). Neurofeedback is a modality that can be incorporated into a counseling practice as an adjunct therapy, in order to increase treatment efficacy for a wide range of client issues (Masterpasqua & Healey, 2003).

This chapter introduces the qualitative grounded theory methodology that was used to explore the factors and processes that influence treatment outcomes when neurofeedback training is used on individuals with trauma symptoms. This chapter includes a rationale for the study, a rationale for using qualitative methodology and a description of grounded theory, the research
questions, the role of the researcher, and data collection and analysis procedures. Through the analysis of data with a grounded theory approach, the goal of this research is to describe a potential model that may guide clinical practice for effective treatment with this population.

**Rationale for Using Qualitative Methodology**

**Description of Qualitative Methodology**

The purpose of qualitative research is to discover, rather than to test, variables (Corbin & Strauss, 2008). Qualitative research is an appropriate methodology when a researcher wants not only the facts, but the meaning behind the facts, what people think about a situation, what they do about it, and what their lived experiences are. There are numerous qualitative research traditions, including case studies, grounded theory, phenomenology, symbolic interaction, ethnography, and participatory action research. Although each qualitative tradition has a different purpose and approach, they all share the common emphasis of listening to people’s stories (Patton, 2002), in order to study a topic in greater depth and detail than a quantitative methodology would allow.

The definition of qualitative research has evolved over time, from “social construction, to interpretivist, and on to social justice” (Creswell, 2007, p. 36). In 1998, Strauss and Corbin offered a simple definition of qualitative research as being any research that is not quantitative in nature, and the definition implies a social constructivist approach:

Any type of research that produces findings not arrived at by statistical procedures or other means of quantification. It can refer to research about persons’ lives, lived experiences, behaviors, emotions, and feelings as well as about organizational functioning, social movements, cultural phenomena, and interaction between nations. (Strauss & Corbin, 1998a, p. 10-11)
A more recent definition of qualitative research by Denzin and Lincoln (2005, p. 3) adds the concept that qualitative research includes interpretation, along with the social justice concept of transforming the world.

In a description of the common factors of qualitative research, Creswell (2007) states that qualitative research has nine common characteristics: [a] being conducted in a natural setting; [b] using the researcher as a key instrument in data collection instead of surveys or assessments; [c] gathering multiple sources of data; [d] using inductive data analysis; [e] focusing on the identification of meanings the participants hold concerning the issue being investigated; [f] using an emergent design instead of a pre-set design; [g] identifying the researcher's theoretical lens, including [h] the researcher’s interpretation of the data collected; and [i] providing a holistic account that is a complex picture of the issue being investigated (Creswell, 2007, pp. 37-39).

In short, qualitative methodology allows a researcher to explore situations and experiences in depth and detail, and to explore the meanings that people assign to events, in a way that quantitative methodology cannot. Qualitative research is, therefore, particularly appropriate when factors for quantitative research have not yet been fully identified, as is the case in this study.

**Qualitative Methodology for This Study**

From the early work of Kamiya (Nowlis & Kamiya, 1970) to Sterman’s research with cats (Clemente, Sterman, & Wyrwicka, 1964) and then with human participants (Sterman & Friar, 1972) to Peniston’s research on the alpha-theta protocol nearly 20 years later (Peniston & Kulkosky, 1989; Saxby & Peniston, 1995) and continuing to the present time, researchers have used a quantitative methodology to study the effectiveness of neurofeedback on a wide variety of
symptoms. Quantitative studies have indicated that neurofeedback may be an effective treatment for physical symptoms such as seizures (Sterman & Egner, 2006), migraine headaches (Kropp, Siniatchkin, & Gerber, 2002; Stokes & Lappin, 2010; ), traumatic brain injury (Schoenberger, et al., 2001), chronic fatigue syndrome (James & Folen, 1996), and fibromyalgia (Mueller, et al. 2001), as well as other disorders such as attention deficit/hyperactivity disorder (Fox, Tharp, & Fox, 2005; Fuchs et al., 2003) autism spectrum (Jarusiewicz, 2002; Kouijzer et al., 2010; Sichel, Fehmi, & Goldstein, 1995); depression and anxiety (Hammond, 2005a; Michael, Krishnaswamy, & Mohamed, 2005), posttraumatic stress disorder (Smith, 2008), obsessive compulsive disorder (Hammond, 2005b), bulimia nervosa (Santarpia, 2008), as well as the cluster of symptoms that frequently follows the many forms of early childhood abuse and neglect (Huang-Storms, 2008).

Although a variety of quantitative research studies on neurofeedback exist, qualitative studies are few in number. There have been qualitative pieces included in some of the quantitative studies, such as when researchers have interviewed the family members of research participants, in order to confirm participant self-reports (Hammond, 2003; Peniston & Kulkosky, 1990; Saxby & Peniston, 1995). In recent years there have been several qualitative studies that explore client experiences of neurofeedback training on disorders such as autism (Byrne, 2005), and diabetes (Monjezi, 2005), the impact on mothers and their special needs children (Parsons, 2008), as well as on functional adults (Parker, 2003). These studies from the participant perspective have indicated positive outcomes and response to neurofeedback training.

From the viewpoint of the neurofeedback provider, White (2008) and Trocki (2006) have contributed qualitative pieces concerning the positive results that they have witnessed when using neurofeedback as a treatment modality. However, to date there has been no known study from the viewpoint of multiple providers concerning the nature of the factors and processes that
may actually contribute to the successful outcomes reported in both these quantitative and qualitative studies. Quantitative studies have generally focused on treatment protocols to the exclusion of other factors that may have influenced neurofeedback training results. In short, no one has yet attempted to answer the question that Peniston (1998) posed concerning the numerous confounding treatment effects that may contribute to positive neurofeedback training outcomes.

In contrast to the dearth of qualitative research on the factors that contribute to positive outcomes in the neurofeedback field, researchers in the wider mental health field have for many years attempted to both enumerate and explore these factors in traditional psychotherapy, using both quantitative (Asay & Lambert, 1999) and qualitative research strategies (Horvath & Symonds, 1991; Hubble & Miller, 1999; Jennings & Skovholt, 1999; Sexton & Whiston, 1994). This study will follow a qualitative methodology similar to that of Jennings and Skovholt (1999) in which master therapists were interviewed concerning factors that contribute to therapist effectiveness. A similar research design was utilized by Staunton (1995) in a qualitative study of therapists considered to be effective in treating individuals with a history of sexual abuse. In both studies, effective therapists were identified through a nomination process for in-depth interviews.

Grounded Theory

Grounded theory is one approach within qualitative research methodology. Theory may be described as “a set of well-developed categories (themes, concepts) that are systematically interrelated through statements of relationship to form a theoretical framework that explains some phenomenon” (Hage, 1972, p. 34). Theory is valuable to the professional body of knowledge in any field because it provides overarching concepts that can guide everyday
decision-making and practice. Theory, along with the concepts that compose it, provide a basis for shared understandings of complex phenomena (Corbin & Strauss, 2008).

Grounded theory, developed by Glaser and Strauss (1967), is defined as “a general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection” (Strauss & Corbin, 1998b, p. 158). Grounded theory seeks to uncover concepts that come from the researcher’s fieldwork, the observations and interviews with people in real life settings, in contrast to the academic settings of the laboratory or university (Patton, 2002). In grounded theory, the researcher develops theory from actual social contexts (Strauss & Corbin, 1998a), by gathering information and then constructing a theoretical explanation from that data (Lincoln & Guba, 1985).

In order to capture the complexity of factors that may come together in complicated and unexpected ways in natural settings, the researcher must obtain multiple perspectives, so that a variety of themes emerge from the data (Corbin & Strauss, 2008). In addition, in order to understand a phenomenon, it must be placed in the larger “social, political, cultural, racial, gender-related, informational, and technological” context (Corbin & Strauss, 2008, p. 8).

In a grounded theory approach, a researcher seeks to develop theory from fieldwork, by exploring the variety of interacting concepts in a complex phenomenon. The concepts will range from lower level to higher level, more abstract concepts. In order for the theory to be cohesive, one concept may be more prominent than the rest. All these concepts interact in an inter/action/emotional response pattern which produces consequences, and the consequences then play into the next inter/action/emotional response pattern (Corbin & Strauss, 2008).
In summary, most research studies on neurofeedback to date have utilized a quantitative methodology that indicate its potential effectiveness in treating a wide range of symptoms. Although there have been several qualitative studies describing the impact of neurofeedback training on clients, qualitative articles from the provider’s viewpoint have been limited to the experiences of single providers, or editorial opinion pieces. Therefore, for this study I chose to explore the experiences and perceptions of multiple neurofeedback providers concerning factors and processes that contribute to treatment outcomes. In order to narrow the focus of the study, I chose to explore these factors and processes particularly when neurofeedback is used on individuals with trauma symptoms. Using a grounded theory approach for data collection and analysis, I then generated a potential model for the effective use of neurofeedback on this specific population.

Researchable Problem

Qualitative grounded theory research begins with the selection of a researchable problem, which may be generated from personal or professional experience or from the existing body of literature on a particular topic (Corbin & Strauss, 2008). My personal experiences of traumatic events as well as my professional experience in counseling both children and adults impacted by a wide variety of traumatic experiences provided the impetus to constantly seek out new and innovative treatments. Particularly challenging are those individuals impacted by early childhood disruptions in attachment, and by childhood abuse and neglect. These traumas that occur at crucial developmental stages potentially affect every area of functioning (Courtois, 2008) and may be played out repeatedly in relationships throughout life, including the therapeutic relationship. Therefore, when colleagues told me their experiences using neurofeedback to effectively treat a wide range of traumatic symptoms, including those
associated with posttraumatic stress disorder, attachment disorders and other forms of complex trauma that generally prove difficult to overcome, I wanted to personally research its effectiveness. Doing so from the viewpoint of the practitioner rather than from that of the client has a distinct advantage in that expert practitioners have years of practice that potentially include thousands of client experiences to draw from, rather than the personal experience of a limited number of individuals. Exploring practitioner experiences may therefore yield a broader range of outcomes than interviews with a small number of neurofeedback clients might produce.

Another source for a researchable problem is the literature in a particular field (Strauss & Corbin, 2008). The prevalence of traumatic experience, recent neuroscience research on the impact of trauma on the human neurological system, and the potential to reach areas of the brain that have been disregulated by trauma though the regulating processes of neurofeedback training, provide the conceptual framework for this study. The paucity of qualitative research in the neurofeedback literature combined with Peniston’s (1998) intriguing statement concerning the confounding treatment effects of his successful research study outcomes, provided the impetus from the professional literature to pursue this research topic from a qualitative grounded theory approach.

My own personal and professional experience, in addition to the professional body of literature in the fields of trauma, neuroscience, and neurofeedback provided the impetus for choosing the researchable problem for this study. The purpose of this qualitative, grounded theory study was to explore the factors and processes that influence treatment outcomes using neurofeedback on individuals with trauma symptoms. For this study, a wide definition of trauma was used, one that includes both symptoms of posttraumatic stress disorder (PTSD; DSM-IV-TR,
2000), and the seven symptom clusters associated with complex trauma (CPTSD; Courtois, 2008; Herman, 1992, 1997).

Research Protocol

Research Questions

After selecting a research problem, the next step in the process of grounded theory research is to develop a broad central research question (Creswell, 2007), and then several specific subquestions. Qualitative research questions are typically open-ended and nondirectional, allowing unanticipated themes to emerge from the interviews. The questions may also evolve as themes emerge (Creswell, 2007). In addition, grounded theory research questions generally involve process, meaning that they are not designed to elicit answers that fall into pre-determined categories, or involve simple negative or affirmative answers; instead, they are intended to elicit more detailed responses, with variable content, yielding data that reveal the participants’ view of the world, using their categories (Patton, 2002). The questions are designed not only to show an outcome, but also the process utilized to achieve the outcome. This study will explore the central research question, “What are the factors and processes that influence treatment outcomes when neurofeedback training is used to treat individuals with trauma symptoms?” In addition, the study will explore the following subquestions:

Subquestion 1: What are common trauma symptoms encountered by neurofeedback providers?

Subquestion 2: What outcomes have neurofeedback providers observed when treating individuals with trauma symptoms?

Subquestion 3: What is the process of neurofeedback training when treating individuals with trauma symptoms?

Subquestion 4: What is the role of counseling in neurofeedback training with individuals with
trauma symptoms?

Subquestion 5: What are neurofeedback providers’ reflections about their experiences in providing neurofeedback training to those who have experienced trauma?

Subquestion 6: To what extent do multicultural factors influence treatment outcomes when neurofeedback is used to treat individuals with trauma symptoms?

Role of the Researcher

In quantitative research, which lends itself to numerical comparisons, the emphasis is on standardized assessment instruments, so that results can be assigned to categories. In contrast, in qualitative research, which offers more in-depth and detailed information, the emphasis is on the researcher as the actual research instrument (Creswell, 2007; Patton, 2002). The researcher identifies a suitable topic, designs the study, formulates research questions and an interview protocol; however, since qualitative research is flexible, the researcher must also make important decisions during the study, concerning how to follow up on emerging data in the zigzag process between field and office (Creswell, 2007).

Because a qualitative researcher is the primary instrument in data gathering and analysis, the researcher must build in safeguards to minimize personal biases, selective perceptions, and theoretical predispositions (Patton, 2007), in order to preserve the integrity of the research data. The researcher should clearly state biases, values, and assumptions at the outset of the study, and continue to do so throughout the research process. The researcher must also put in place a means for self-reflection during the data gathering process so that research results prove authentic and trustworthy. The following section contains a description of how I utilized all of these measures in this study, in order to enhance the authenticity and trustworthiness of the research outcomes.
Researcher Assumptions and Biases

Both the researcher and the participants bring their own set of assumptions, biases, and beliefs into the research process (Corbin & Strauss, 2008). Some researchers have spoken of "bracketing" assumptions as a means of setting aside, as much as possible, the researcher's own preconceived ideas so that the data from the research participants can freely emerge (Creswell, 2007). In all probability it is not possible to achieve this goal, since assumptions, biases and beliefs often have deep cultural roots that are difficult to identify (Corbin & Strauss, 2008). However, as part of the reflective process, and for the purpose of using my experience to enhance the data gathering and analysis, I will acknowledge some of my underlying assumptions in this section.

My primary assumption is that neurofeedback can be an effective treatment for many psychological and neurological disorders. I hold this assumption due to hearing one person's account of being cured of chronic fatigue syndrome and a psychologist's account of remarkable changes in clients who engaged in neurofeedback along with counseling. I also assume that as practitioners become more experienced, they will also tend to become more effective.

In addition, I hold the assumption that neurofeedback may be similar to counseling in two ways. First, having observed some neurofeedback practitioners with clients, I assume that the process may work much like therapy, in that the more the practitioner listens and empathizes, the better the neurofeedback training tends to work. In other words, the therapeutic alliance is significant in positive treatment outcomes in neurofeedback training, just as it is in the counseling process (Horvath & Symonds, 1991).

Secondly, I have read posts on a neurofeedback email listserve, in which some neurofeedback practitioners recommend that a practitioner personally experience neurofeedback
before treating clients. This recommendation is similar to the advice frequently offered to counselors, that they will be more effective with clients if they do their own emotional work by undertaking their own personal counseling process. I assume that neurofeedback practitioners who done their own work with neurofeedback will tend to be more effective in their work with clients.

Throughout the research process, I endeavored to use my neurofeedback knowledge and experience in a manner that enhanced the process without unduly influencing it in a particular direction, in order to allow participant themes to emerge freely. To this end, I utilized a research team, a reflexive journal, and member checking. All these strategies are described in the following sections.

**Researcher Objectivity**

In the past, objectivity has been considered to be the strength and the hallmark of the scientific method (Patton, 2002). However, in this postmodern era, the concept of objectivity may hold less meaning, as researchers become aware that all knowledge is socially constructed, and therefore no research can be truly objective or value free. More meaningful words to describe the integrity and high quality of qualitative research may be *trustworthiness* and *authenticity* (Patton, 2002, p. 51).

*Trustworthiness* refers to the rigor of the research, evaluated in part by the quality of the systematic process, and how well the research follows that process (Patton, 2002). *Authenticity* refers to the researcher’s truthfulness and honesty in reporting research results, evaluated by the researcher’s awareness of personal perspectives, ability to appreciate and report on the perspectives of participants, and both fairness and completeness in reporting those perspectives (Patton, 2002). Rather than speaking of objectivity, it may be more accurate to speak of
empathic neutrality (Patton, 2002, p. 51), in describing the goal of the researcher’s stance as an instrument in the qualitative research project.

Empathic neutrality increases the credibility of the research, because it means that the researcher has taken identifiable steps not to bias the data toward one particular point of view or theoretical orientation. The researcher remains open to emerging themes and unexpected outcomes, open to the phenomenon as it unfolds, willing to report complexities and multiple perspectives, and offering a balanced view (Patton, 2002).

**Strategies to maintain trustworthiness and authenticity.** I utilized several means to maintain trustworthiness and authenticity during the data collection and analysis process. During the nomination process, I kept a chart of the neurofeedback practitioners that were nominated by their peers for interviews. The chart included the date that each practitioner was nominated and by whom, the date that I contacted the practitioner, the practitioner response to my contact, and, if the practitioner responded positively, the date that the interview actually took place. This chart became part of my audit trail.

I put several other systems in place to enhance the trustworthiness of the data. I continued to monitor my biases by keeping a reflexive journal, in which I recorded thoughts and feelings after each interview and during the data collection and analysis process. I utilized a system of triangulation of data, meaning that I collected multiple forms of data, including a demographic form, an initial interview, a follow-up interview, and a final written email confirming results. Using multiple sources of data allowed me and my research team to compare themes across multiple sources, and consider alternative explanations for outcomes. In addition, I used member checking by sending participants the transcripts of their interviews via email,
asking them to verify that the transcripts accurately reflected the meanings that they intended to convey. I then edited transcripts in response to participants’ comments.

Lastly, and perhaps most importantly, a trained research team assisted me in coding transcripts and analyzing data, in order to monitor selective bias. I met with the research team approximately every six weeks throughout the course of the data gathering and analysis process in order to discuss emerging themes, prominent quotes, and other observations. Bringing multiple perspectives into the research analysis increased the likelihood of maintaining authenticity, as team members at times focused on themes that I had missed and corroborated themes that I thought were salient. In one instance, team members warned me that my comments in one particular interview revealed a possible bias. Their warning helped me to be more aware of my interview style, so as to maintain the trustworthiness and the authenticity of the research data throughout the interviews.

The research team consisted of six members, including myself as the primary researcher and team leader. Team members were either currently enrolled or recent graduates of the doctoral program of Counselor Education and Supervision at Old Dominion University. Five of the team members had completed the doctoral level qualitative research course at Old Dominion University. I provided a special training session for one team member who had not yet completed the qualitative course but was currently enrolled, to ensure that we all had similar training in coding transcripts.

Before the data collection began, I met with the research team for an informational session about neurofeedback as well as training in qualitative analysis of transcripts. For the informational part of the meeting, I gave each team member a packet that contained a description of neurofeedback, common neurofeedback terms, an informational brochure, and a DVD on
neurofeedback published by EEGInfo. I used a styrofoam head to explain the terms used to
describe electrode placements, so that team members would understand this terminology when
they encountered it in transcripts. For the training in qualitative analysis, I provided a description
of grounded theory and a description of the procedures for this study, including the plan for
analyzing and passing transcripts from one team member to another. For an example of
transcript analysis, I showed team members a portion of a transcript that I had previously
analyzed for a different qualitative study. I also showed them the coding chart and the memo
that we would use in our analysis of transcripts. As a visual representation of my preexisting
ideas, I had drawn a concept map, which I included in the training packet and discussed with the
team. We then all discussed preexisting biases and assumptions regarding neurofeedback
training and agreed to continue this discussion throughout the analysis process.

We passed transcripts to team members in the following manner. The research team
consisted of six members, including me as the main researcher, and we divided into pairs
according to geographical proximity. In order to remain immersed in the data, I transcribed the
majority of the interviews. After I completed and transcribed an interview, I passed it to a
research pair for analysis. The two individuals of the research pair completed a separate
transcript analysis by making comments on the transcript using track changes and writing salient
themes on a memo. The research pair then met to reach a consensus on the themes, compiled
comments onto one transcript, memo, and coding chart, and then passed this information onto
the next team member. In this manner, all team members read and commented on every
transcript, agreeing with themes delineated by other team members, or adding themes that
seemed salient to them. We instituted a rotational system in which each research pair took a turn
at being the first to analyze the transcripts, since that first position was more labor intensive than
subsequent positions. When the transcript, memo, and coding chart completed the rotation through all team members and came back to me, I printed them out and placed them in notebooks that I had organized for my audit trail.

At the beginning of the research, the team members knew very little about neurofeedback, and none had experienced it. They all expressed the desire to see the actual equipment and to experience it themselves, in order to enhance their understanding of the transcripts. Therefore, I organized one meeting during which I showed my neurofeedback equipment to the group and did a short segment of neurofeedback training on each team member. Afterwards, team members commented that this experience helped them to understand the interview transcripts more thoroughly.

During the nine months that data collection and analysis occurred, I met with the research team a total of eight times. We met approximately every six weeks during the time period in which we analyzed the first round of interviews, discussing and coming to consensus on themes three transcripts at a time. When the first and second rounds of data collection were finished, we met once again to agree on themes. For the third round of data collection, we reached consensus via email. At the end of the study, we met one final time in order to process how this research project had impacted each of us. Team members who could not attend the final meeting were asked to write a paragraph on the impact of the study on them and send it to me. As part of my audit trail, I kept a summary of the discussion that occurred at each team meeting.

The first meeting was the informational and training session, and the second meeting was the actual neurofeedback experience. We subsequently met approximately every six weeks at my home on Sunday nights in order to discuss transcript analysis and emerging themes. As the team identified themes for each research participant, we wrote them on index cards and taped
them to my kitchen walls, organized by participant number. I left the cards in place on the walls throughout the analysis process, so that each time we met, we had a visual representation of the emerging data. This visual representation facilitated our discussions, and helped me to be immersed in the data on a daily basis. Photos of the wall analysis became part of my audit trail. In addition, I provided dinner for each meeting, in order to encourage collegial relationships that would facilitate open discussion. The atmosphere of unrushed, open discussion proved to be an important aspect of the research process, as team members felt comfortable enough to challenge me in areas where they detected my biases influencing the interviews or data analysis.

**Researcher Subjectivity**

Traditionally, researchers have emphasized the necessity of objectivity in the process of data collection and analysis; however, the current consensus is that objectivity in qualitative research is a myth (Corbin & Strauss, 2008), since there is a constant interplay between researcher and data in the qualitative process. If objectivity is unrealistic, the goal then becomes to use subjectivity, or sensitivity, in ways that will enhance research outcomes (Corbin & Strauss, 2008). A qualitative researcher’s goal is to see the meaning of any given situation through the eyes of the participants. The more awareness the researcher has concerning the subjective nature of the data collection and analysis process, the more likely the recognition of times when the researcher begins to see the situation through his or her own eyes in ways that may influence data collection and interpretation (Corbin & Strauss, 2008).

**Strategies to maintain subjectivity.** In qualitative research, the goal is not to eradicate subjectivity, but to use subjectivity in a manner that enhances the research quality, while monitoring for ways in which subjective elements may distort the data collection and analysis process. The researcher uses subjectivity to enhance sensitivity, which means “having insight,
being tuned in to, being able to pick up on relevant issues, events, and happenings in data. It means being able to present the view of the participants and taking the role of the other through immersion in data” (Corbin & Strauss, 2008, p. 32). Background, knowledge, and experience enhance the researcher’s sensitivity both to data concepts, and to the connections between those concepts (Corbin & Strauss, 2008).

I began to increase my sensitivity to neurofeedback concepts 15 months before the data collection actually began by attending a four-day neurofeedback training offered by one of the principal neurofeedback training organizations in the United States. During this training, I was exposed to some of the early neurofeedback research and the neuroscience theories that provide the foundation to neurofeedback training. I also learned to operate one model of equipment, subsequently purchased a neurofeedback system, and began practicing neurofeedback on myself and on others. When I opened a private practice a year later, I began to use neurofeedback with clients, when it appeared that it could ameliorate presenting symptoms. In addition, during the data gathering process, I attended a one-day regional training sponsored by a biofeedback/neurofeedback professional organization. This background, knowledge, and experience has made me familiar with the neurofeedback equipment and protocols, has helped me to be immersed in the data, and has therefore increased my sensitivity to concepts expressed by neurofeedback practitioners.

**Research Plan**

A qualitative methodology, grounded theory approach was used to explore the factors and processes that contribute to treatment outcomes using neurofeedback to treat individuals with trauma symptoms. Before beginning this research, I sought approval of my dissertation chair. On May 1, 2010, I submitted an application to the Human Subjects Review Board of the
The application requested exempt status for this study, as the research involved interviews with neurofeedback practitioners and did not involve direct contact with neurofeedback clients and therefore did not require the disclosure of any confidential client information. On May 13, 2010, the Human Subjects Review Committee granted the request for exemption from the Institutional Review Board, and approved the request to pursue this proposal indefinitely, provided that no modifications are made to the study (appendix A). I began gathering data for this research project on September 4, 2010, after my dissertation committee approved my proposal and my methodologist approved the final version of my interview protocol.

**Sampling Procedures**

I used a purposeful sampling strategy for this study because I wanted to identify participants who were information rich and could therefore meaningfully contribute to an understanding of the research problem (Creswell, 2007). I then asked these key informants to identify three to five other neurofeedback practitioners whom they would consider to be knowledgeable in treating people who exhibit trauma symptoms by asking the question, “To whom (other than yourself) would you most likely and comfortably refer a person—particularly a close acquaintance, friend, or relative—for neurofeedback services? In other words, based on your knowledge of that person’s work, whom would you consider to be especially effective in providing neurofeedback services?” (appendix B). I utilized this snowball sampling method, a form of purposeful sampling (Patton, 2002), for the nomination process.

**Participant Selection Procedures**

In order to begin the nomination process, I posted a request for nominations (appendix B) on the email listserve of EEGInfo, one of the major organizations based in the United States that
offers neurofeedback educational training modules for professionals. When no one from the listserv responded, I identified two well-respected neurofeedback providers from different regions in the United States (one male and one female), and asked them to begin the nomination process. I chose one person on the basis of having been involved in neurofeedback research and training since nearly the beginning of the field, and the other on the basis of being a well-respected psychotherapist in the community who had added neurofeedback to an existing private practice. These two key informants had a mean of 20 years of experience in mental health practice or neurofeedback research and training. I then asked those nominated by these first key informants to nominate others, and I kept a detailed chart of nominations, contacts, and responses. Practitioners were not permitted to nominate themselves. In addition, those chosen for participation in the study were required to have a current license in one of the mental health professions or a biofeedback certification.

Since I wanted to complete face to face interviews (appendix G) in the practitioner’s office for the first round of interviews, for the most part I limited participants to those on the East coast. I was able to interview one participant from the West coast when the participant came East to attend a conference. I also interviewed one participant from the Midwest via Skype because I felt that we knew each other well enough that a Skype contact would not hinder the flow of information provided in the interview. I attempted to diversity the sample as much as possible by seeking both male and female participants, those from large metropolitan areas as well as rural areas, those from different geographical regions of the country, and those from all three branches of the mental health professions, including counselors, psychologists, and social workers. I sought diversity so that the study outcomes might be more representative of neurofeedback practitioners as a whole and therefore the potential treatment model more
meaningful and applicable. The one area in which I could not diversify the sample was in ethnicity and race, only because all nominated practitioners were Caucasian, a fact that currently reflects the neurofeedback field as a whole.

I tabulated all nominations and rank ordered those who received several endorsements; however, I did not use a predetermined number of nominations as the only basis for participant inclusion. Instead, since the goal of purposeful sampling is to identify a diverse and information rich sample, I also relied on the expertise and enthusiasm of the nominator as an indication of the expertise of the nominee (Luborsky et al, 1985). In addition, I considered the manner in which participants might contribute to the sample diversity, as well as their geographical accessibility for a face to face interview.

**Gaining Entry**

Gaining entry to a group of professionals required more than physical access to their offices. It required an initial introduction via email that appeared both professional and intriguing. One participant expressed how important that initial contact was in her agreement to participate in the study, particularly pointing out the informed consent. Another participant wanted to make further inquiries concerning my background and training in neurofeedback before agreeing to participate. We therefore exchanged several informational emails before consent was given. In addition, I found that people were more willing to participate if they knew who had nominated them. I therefore asked permission from the nominator to share this information with the potential participant, and all agreed. Gaining entry started before entering the physical office space.

After each participant had been identified, I gained entry to the practitioner's office through the invitation of the nominated neurofeedback provider who agreed to participate in the
study. The initial interview with each participant was face to face, with the exception of one Skype interview using video over the computer. I visited eight of the ten practitioner offices, with the exception of the one Skype interview and the one participant whom I interviewed at a conference, due to the geographical distance separating us. The second interview was by telephone. The third contact was through email, in which I asked the last two interview questions. I also sent the interview transcripts to participants so that they could verify accuracy.

**Measures to Ensure Participant Confidentiality and Safety**

To preserve confidentiality and anonymity, participants’ identities were disguised through the use of a randomly assigned participant identification code, known only to me. Observation notes, audio-taped interviews, and transcripts of the interviews, were all kept in a secure location. Individual interviews were taped and transcribed either by me or by a transcriptionist who was instructed to omit all personal identifying information from the typed transcript. After the research was complete, I erased the taped interviews. All transcripts, consent forms, and data will be stored in a secure location for seven years, after which time I will destroy all these items.

**Data Collection Procedures**

For this study, data collection procedures included [a] a Neurofeedback Provider Demographic Information form (appendix F); [b] an initial participant interview, conducted face to face (appendix G); [c] a follow-up individual interview, conducted via telephone (appendix G); [d] a follow-up email contact, in which participants were asked to confirm salient themes and quotes included in a code book (appendix G); and [e] written information from the neurofeedback provider, including a resume or curriculum vitae (if available), brochures or materials which they typically give clients or use to describe their services, a professional
Individual Interviews

Two rounds of semi-structured individual interviews were utilized as the primary method of data collection (appendix G). Semi-structured interviews are appropriate for a grounded theory study, because the interview process is flexible, thereby allowing for unexpected themes to emerge. Before the initial interview, I sent each participant the Demographic Form (appendix F), Informed Consent (appendix D), and Consent to Record Form (appendix E). Participants either completed the forms and emailed them to me before the interview or gave them to me at the time of the interview appointment.

I had asked participants for an initial face to face interview that would last approximately 60 to 90 minutes. However, interviews sometimes stretched into two hours or more, as practitioners were often generous with their time and eager to talk about their experiences. They frequently shared inside information about the neuofeedback field in general and other neurofeedback providers in particular.

For three of the interviews, I spent nearly half a day with providers in interviews that started in the office between client appointments, continued over lunch, and ended back in the office. I began recording one particular interview in the practitioner’s office, continued recording as we walked down the hall, rode the elevator to the first floor, drove to a nearby restaurant for lunch, ate our lunch, and then drove back in the office again, my two small recorders going the entire time. In one case, since the practitioner knew that I was driving from another state for the interview, I was invited for dinner the night before the interview, spent the night with the family, observed the practitioner doing neurofeedback with a client the next
morning, then finished off the interview and drove home. All these experiences afforded me a feel for the provider’s personal and professional life, as I was immersed in the data in a manner that would not have happened in a telephone interview. I learned to allow plenty of time for interviews, since unexpected opportunities for insightful experiences in the field often occurred.

**Initial interview questions.** At the start of the initial interview, I confirmed that I had all forms completed and signed. I then reviewed the purpose of the study and reminded the participant that in speaking about trauma, we would be referring to a wide definition that included both posttraumatic stress disorder and the complex trauma that frequently follows the various forms of childhood abuse or other ongoing situations (Courtois, 2008).

I recorded the initial interview (appendix G) so that it could be transcribed and analyzed. I used two recording devices, in the event that one would malfunction, a situation that actually happened twice. The initial interview questions were broad and general, in order to allow potentially unanticipated themes to emerge. Subquestions were more specific. I followed the interview protocol for every interview. If a participant had already answered a current question within a previous question, I still asked the current question, in case the participant thought of more information to add. The following questions comprised the initial interview protocol (appendix G):

**Follow up on the Demographic Information Form:**

Is there any information that was not included on the Provider Demographic information form, that you would like to add?

**Opening questions:**

1. How did you first hear about neurofeedback?
   
   a. What were your first impressions of neurofeedback?

2. What made you decide to set up a practice using neurofeedback, or to incorporate
neurofeedback into your existing practice?
   a. Is there anyone or anything in particular that influenced you or helped you?

3. What was it like when you first started using neurofeedback in your practice?
   a. How is your practice different now from when you started?

4. Tell me what a typical day looks like for you in your practice.
   a. Describe the typical clients who come to you for neurofeedback.

**Central Interview Questions:**

You have been nominated by your peers as being effective in using neurofeedback to treat clients.

5. In your opinion, what **factors** have contributed to positive treatment outcomes when using neurofeedback *in general*? (factors: for example, personal, therapeutic, professional, therapeutic alliance, etc.)
   a. In your opinion, what **factors** have contributed to positive treatment outcomes in using neurofeedback on clients *with trauma symptoms*?
   b. Are there any factors that have been obstacles to successful treatment?
   c. How might multicultural factors contribute to positive or negative treatment outcomes? (for example, gender, race, ethnicity, age, sexual orientation)
   d. In your opinion, what factors distinguish an expert neurofeedback provider from a good provider, especially in treating individuals with trauma symptoms?
      1. In your opinion, what part does years of experience play in a provider’s expertise?

6. Now I would like to know more about the **process** of providing neurofeedback to clients who have experienced some type of trauma.
   a. What types of symptoms have you noticed in clients who have experienced trauma?
b. Now that you’ve talked about _____, are there any additional symptoms? (Show list of PTSD symptoms and complex trauma symptoms)

c. Tell me about the process of treating those symptoms.

d. I’m wondering what differences you notice in treating clients who have experienced trauma, and those who haven’t?

e. Are there any differences in your responses or feelings in treating these clients?

7. Now I’d like to ask you more about actual treatment. In general, how do you go about treating trauma symptoms?

a. I would like to hear about your experience treating a client with trauma symptoms, when the client seemed to be helped significantly.

b. How did you know the client was helped?

c. Now I would like to hear about an experience treating a client with trauma symptoms, when the client was helped very little, or not at all.

d. How did you know that the client was not helped?

e. In your opinion, what factors or processes contributed to the difference in the outcomes between the two clients?

Follow-up interviews

The second interview, which took place over the telephone, lasted 30 to 60 minutes. Follow-up interviews provided an opportunity for the participant to add new information that was not shared in the initial interview and to clarify and confirm previously discussed information and themes. Both the initial interview and the telephone interview were recorded and transcribed for the purpose of data analysis.
Follow-up interview questions. The following questions comprised the follow-up telephone interview (appendix G):

1. What have been the most important lessons that you have learned through your years of practice?
   a. I would like to know about any critical incidents or circumstances that you have experienced, incidents that changed your views, or challenged you to do things a bit differently.

2. You’ve told me some factors, processes, and treatments that contribute to positive treatment outcomes. I’m wondering if you can narrow it down a bit. If you had to choose one thing that makes you successful in treating clients with trauma symptoms, what would it be?

3. In your opinion, how much of neurofeedback training is art versus science?

4. What have you noticed while treating clients with trauma symptoms, when neurofeedback is combined with counseling or some other treatment modality?

5. Tell me about your experiences using the alpha-theta protocol. (If not already discussed)

Personal reflection questions:

6. I’m wondering how you balance your professional practice with your personal life.
   a. Do you ever take your clients home with you? (not physically, but mentally and emotionally)

7. After having these experiences, what advice would you give to someone who wants to begin using neurofeedback as a treatment modality, particularly with those who have experienced trauma?

8. I’d like to know what you think about the future of neurofeedback personally.
a. Where do you see yourself in two years? Five years? Ten years?

b. How will you be different then, both personally and professionally, from now?

9. What do you think about the future of neurofeedback?
   a. What are your thoughts about the future of neurofeedback?
   b. What are your hopes for the future of neurofeedback?

10. Is there anything that you would like to ask me?

   Email questions. The final two questions in the interview protocol were asked in the email follow-up. The email contact was also printed out for analysis. The following questions comprised the final data collection (appendix G):

   1. Is there anything else that you would like to tell me about your experiences with neurofeedback?

   2. If you could do it all over again (in terms of your mental health/neurofeedback career) what would you do the same?
      a. What would you do differently?

   The research team and I analyzed the transcripts as they were completed. The majority of the initial interviews were transcribed and analyzed before the follow-up interviews were started. This process allowed us to sort through new and repeating themes as they emerged from the interviews, and to follow up on salient themes from the initial interviews in the subsequent interviews.

Document Reviews

Documents were also utilized in this study for the purpose of triangulation of data. I asked each participant to complete a Neurofeedback Provider Demographic Information form (appendix F) before the initial interview appointment. This form provided information about the
neurofeedback provider's professional training and experience as well as client demographic information. During the initial interview, I also asked each practitioner to supply a resume or curriculum vitae (if available), brochures or materials which they typically give clients or use to describe their services, a professional disclosure statement, articles, and other pertinent materials.

**Data Analysis**

For data analysis, a "constant comparative method" (Creswell, 2007, p. 64) was utilized, in which the researcher "zigzags" between the field to gather information, and then home to analyze the information that was gathered, then back to the field to gather more information, and then once again analyzing the data. This process continued until the data was saturated, meaning that both I and the research team noted that themes were repeating and no new themes were emerging. In addition, data saturation also denotes that categories are developed in terms of their "properties and dimensions, including variation, and if theory building, the delineating of relationships between concepts" (Corbin & Strauss, 2008, p. 143). We noticed that themes were not only repeating, but were gaining depth of detail and variation.

I began approaching the point of data saturation after I had completed seven initial interviews that totaled 13 ½ hours and 3 follow-up interviews that totaled 2 ½ hours, for a total of 16 hours of interviews. These totals do not include unrecorded time spent in practitioners' homes and offices, or unrecorded conversations while eating meals in restaurants. At that point, I asked three more nominees to participate in the research, and they consented. Their participation brought the total number of participants to ten. With ten participants yielding 20 interviews and 10 written contacts, the research team and I judged the concepts to be sufficiently developed for the purposes of this study. Concepts that may not have been illuminated by this study are a limitation to the research findings (Corbin & Strauss, 2008).
Using the constant comparative method (Creswell, 2007) of data gathering allowed me to sense when data was nearing saturation, as data analysis continued throughout the data gathering process. Data analysis involves reducing the amount of information gathered and interpreting that data (Corbin & Strauss, 2008). The data analysis process involves three stages: [a] data reduction; [b] data display; and [c] conclusion drawing and verification (Miles & Huberman, 1994).

Data Reduction

The process of data reduction involves selecting, focusing, simplifying, and transforming themes from manuscripts (Miles & Huberman, 1994). Through the process of data reduction, I organized the data so that I could draw conclusions from it. Data reduction took place continuously throughout the data collection process and involved the processes of open coding, axial coding (Corbin & Strauss, 2008), and selective coding (Creswell, 2007).

Coding Procedures

The analytic process involved being immersed in the data with repeated sorting, coding, and comparisons that characterize the grounded theory approach to data analysis. Interviews were transcribed personally or by a transcriptionist. If transcribed by someone other than myself, I checked the transcription for accuracy by listening to the recorded interview while reading the transcription. I made corrections as necessary. I then passed the transcribed interview to team research pairs in a rotational system, so that each pair took turns being first in receiving transcripts. In addition, I sent the research pair a chart for recording key words, themes, prominent quotes, and general impressions from the transcripts, as well as a memo form for recording salient impressions and quotes. The research pair started the coding process by using track changes to make comments on the transcript, completing the coding chart, and making
comments on the memo. The pair then met for consensus on codes and subsequently sent their
documents to other team members in a prescribed order. After all team members had read and
commented on the transcripts, they were passed back to me. Regular meetings of the research
team facilitated continuous data reduction and provided a forum for reaching code consensus.
Coding procedures included open coding, axial coding, and selective coding. The primary
researcher and the research team participated in all coding aspects.

**Open coding.** Analysis began with open coding, which is the examination of small
sections of text made up of individual words, phrases, and sentences. The research team,
including the primary researcher, produced a list of these key elements and then used these
smaller elements to produce categories of codes. The team was also instructed to write analytic
notes on the interview transcripts in order to highlight salient themes.

**Axial coding.** Open coding was followed by axial coding, which involves putting
subcategories under major categories. During the process of axial coding, I identified one open
coding category on which to focus. That central category became the core phenomenon
(Creswell, 2007). After identifying the core phenomenon, I returned to the data in order to create
categories related to this core phenomenon. According to Corbin and Strauss (2008), these
related categories may consist of causal conditions, strategies, intervening conditions, and
consequences. The research team and I discussed axial coding in particular at team meetings
where we revised the original concept map to more accurately depict the emerging concepts.

**Selective coding.** Selective coding is the final step in the coding process, in which I
developed propositions or hypotheses that connect the categories in the model. Selective coding
may also involve creating a story that depicts this connection (Creswell, 2007). The connections
among the categories constitute a theory, which is articulated in Chapter 4. Utilizing coding
charts, the revision of concept maps, and the system of index cards on the wall facilitated the recognition of the connections between concepts that emerged from the data.

**Conditional matrices coding.** A conditional matrix takes the model that emerges from the data further, in providing a visual representation of the relationships among the macro and micro conditions that impact the phenomenon (Creswell, 2007). Corbin and Strauss (2008) described the conditional matrix as consisting of labeled concentric circles, starting with the individual in the center, then the group, organization, community, region, nation, and global world, in order to depict the theory's larger implications.

**Data Display**

Data displays are a method of displaying data in an organized manner (Miles & Huberman, 1994). Data displays are visual representations that facilitate identifying relationships in the data, so that the researcher can draw conclusions. Data displays include charts, tables, graphs, and matrices. The data display for this study consisted of the Final Concept Map depicting the grounded theory the emerged from the data (Figure 4.13).

**Verification Procedures**

Verification procedures allow the quality of the research to be assessed. For this study verification procedures included triangulation of data sources, constant comparison, regular consultation with the research team, member checking, and an audit trail. These verification procedures are described in the following sections.

**Credibility**

In quantitative research, the terms *reliability* and *validity* are used to evaluate the quality and soundness of the research design, data collection, and analysis. In a qualitative study, the terms *trustworthiness* and *authenticity* are used to describe research that is balanced, fair, and
complete (Patton, 2002). Trustworthiness includes the four criteria of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

_Credibility_ means demonstrating that the results and conclusions drawn from the study are believable. Credibility is determined by asking such questions as [a] Do conclusions of this research make sense? [b] Do conclusions adequately describe research participants? and [c] Do conclusions authentically represent the phenomena of interest? (Lincoln & Guba, 1985; Miles & Huberman, 1994). For this study I utilized techniques that would minimize my biases and preconceived ideas, so that themes could freely emerge from the data. These techniques included stating my known biases at the beginning of the study; using systematic data collection procedures; utilizing triangulation of data types, including interviews, observations, and written documents; using triangulation of analysis, with myself as the main researcher as well as a research team; including member checking, which allows participants to comment on whether analysis results accurately reflect what they intended to express; and writing in a reflexive journal. All these techniques are crucial in establishing the credibility of the research project outcomes.

_Transferability_

Transferability is the term used to describe the degree to which results can be generalized to other settings (Gay & Airasian, 2000). Although transferability is an important goal in quantitative research, it is not a goal in qualitative research. So that transferability can be determined, I provided a thick description of participants, contexts, and findings. I provided a profile of each participant, developed from information provided on the Practitioner Demographic Information Form (appendix F) and at the initial interview (appendix G). In addition, I recorded each step of the data collection and analysis process in an audit trail. These
techniques will help readers to determine whether or not the outcomes of this study are transferrable to other contexts.

**Dependability**

*Dependability* describes the extent to which the outcomes of the study are consistent across time and among researchers (Lincoln & Guba, 1985; Miles & Huberman, 1994), so that this research study can be repeated by subsequent researchers. To enhance dependability I have provided a detailed account of the methods that were used in this study in this document, as well as in my written results, so that other researchers could replicate this study in the future. I also maintained a detailed account of my research activities and outcomes in an audit trail.

The audit trail for this study consists of the following items: the initial research questions and interview questions as well as later revisions; the training packet that I used in the initial research team meeting; a chronological narrative of research activities; a chart that depicts the nomination process, including the names of nominated practitioners, the date they were nominated and by whom, the date I contacted them to request an interview, their response to that request, and the date that the actual interview occurred, if they responded positively; written documents from each practitioner, including a demographic form, a signed consent to record form, and a signed informed consent for research participation; documents that practitioners use in their practice, such as informed consents, brochures, and assessment forms; articles that practitioners have published; verbatim transcriptions of each interview that include comments made by each research team member; memos on all transcripts from each team member; a record of all open coding analysis, initial coding efforts, researcher notes, other analytic activities, and all final axial codes, as reflected in the final code book; an initial concept map that depicts my original thinking on the research topic, and concept maps that team members drew during
meetings as data analysis progressed; a summary of each research team meeting; my reflexive journal; and photos of the index cards on my kitchen walls that served as a visual depiction of themes in order to facilitate data immersion and analysis.

In total, the audit trail consists of 1,290 pages of materials, including 493 pages of transcribed interviews; 116 pages of written materials from neurofeedback practitioners, including the demographic form, signed consents, and the third email follow-up; 431 pages of coding charts and memos; and approximately 200 pages of notes, including the nomination chart, contact sheets, summaries of research team meetings, chronological dates, my reflexive journal, and other miscellaneous information. Dr. Laurie Craigen, the methodologist for this study, served as the external auditor for the audit trail. In this capacity, she reviewed my entire audit trail after completion of the analysis of my first round of interviews and again when all data was gathered and analyzed.

Confirmability

Confirmability describes the extent to which the outcomes of the study are consistent with the perspectives of the participants, and not a reflection of the researcher’s preconceived biases or agendas. In order to enhance confirmability, I stated my biases and assumptions concerning the research project at the beginning of the study, as well as throughout the data collection process (Creswell, 2002). In addition, I used techniques that minimize researcher bias, such as systematic data collection procedures, triangulation of data sources and data analysis, member checking, the use of a reflexive journal, and an extensive audit trail that thoroughly documents research activities and outcomes.
Summary

There is a paucity of qualitative research on the factors that facilitate the effectiveness of neurofeedback training as indicated in numerous quantitative studies. Therefore, as a means of exploring those factors, a qualitative methodology with a grounded theory approach was chosen for this research study. The purpose of this study was to explore, from the viewpoint of neurofeedback practitioners, the factors and processes that influence outcomes when using neurofeedback to treat individuals who exhibit trauma symptoms. This chapter included a rationale for the study, as well a rationale for using a qualitative, grounded theory methodology. In addition, this chapter included the research questions, the role of the researcher, and the data collection and analysis procedures. Lastly, the chapter included a description of verification procedures utilized to enhance the trustworthiness and authenticity of the research findings. The data gathered through this research project was used to create a potential model for positive treatment outcomes.
CHAPTER FOUR
FINDINGS AND INTERPRETATIONS

Introduction

Chapter 4 contains a summary of the research results that answer the research question “What are the factors and processes that influence treatment outcomes when neurofeedback training is used to treat individuals with trauma symptoms?” The analysis of the data at the end of the chapter will answer the research question.

The first section of this chapter, entitled Participant Profiles, presents a group profile of participants followed by an individual profile, or withincase analysis, of each of the ten participants. Each individual profile includes a narrative that explains the themes that emerged from the open coding process followed by a chart displaying that participant’s prominent themes. The second section, entitled Participant Themes, contains the results of the axial coding process or cross case analysis. The section includes a description of the prominent themes that emerged across participants for the three rounds of data collection. The third section, entitled Grounded Theory, contains the results of the selective coding process in which I chose one prominent theme around which the others are organized. It also contains a visual representation of the theory and a narrative explanation of the factors and processes that contribute to neurofeedback outcomes with trauma survivors.

Overview of Data Collection

In order to begin the data collection process, I posted a request for nominations of expert neurofeedback providers on one of the major neurofeedback email listserves. I did not receive any responses to this nomination request. I then asked several people in the neurofeedback field who are active in training others to begin the nomination process by providing me with three to
five names of providers whom they consider to be experts in the neurofeedback field, particularly in treating those who have experienced trauma. I contacted those first nominees and asked them to nominate others. Using this snowball sampling method, I received 75 nominations that represented 32 neurofeedback practitioners (19 women and 13 men). In addition to nominations, I also received several negative comments concerning practitioners not to interview. I considered the negative comments as I selected participants.

I contacted 18 nominated practitioners to request participation in the study (nine women and nine men). Of the nine women contacted, one woman declined to participate, one did not respond to my request, and seven agreed to participate in the study. Of the nine men contacted, five did not respond to my request, one responded after I had already selected the participants, and three agreed to participate. If I did not receive a response from a practitioner after two contacts, I did not attempt another contact.

Important criteria for determining the rigor of a qualitative study include the amount of researcher time spent in the field as well as the amount of data from which the researcher draws conclusions (Creswell, 2007). The data for this study consisted of 31 hours of recorded initial and follow-up interviews in addition to a written email follow-up. I spent approximately 40 additional hours in the field with participants in informal ways. I was invited to observe a neurofeedback session with a client, invited to eat meals with participants, and in one case when I travelled out of state for the interview, invited to spend the night at the participant’s home. I also attended educational events, including a four-day neurofeedback training in preparation for this study and a one-day regional conference during the data collection. In addition, I spent approximately 25 hours meeting with my research partner and research team for code analysis and sorting.
The data collection process took place over a nine month time frame. I transcribed the majority of the interviews, which totaled 493 pages of verbatim transcription. Other materials included 116 pages of written information from neurofeedback providers, 431 pages of coding charts and memos, and approximately 200 pages of notes. The external auditor examined the audit trail, which consisted of 1,290 pages of materials.

**Participant Profiles**

**Group Profile**

A demographic description of participants is shown in Table 4.1. All participants were Caucasian. Their ages ranged from mid-50s to late 70s, a fact not listed on the chart but obtained from the interviews. Participants included seven women and three men from six different states and four different regions of the country, including the Pacific Coast, New England, the Midwest, and the Southern Atlantic region. The Southern Atlantic region includes the states of Virginia, West Virginia, and Maryland. There were six participants from large metropolitan areas, one from a medium metropolitan area, one from a small college town, and two from rural towns of 3,000 to 4,000 people. The large, medium, small, and rural categories used in Table 4.1 are based on the Metropolitan Statistical Areas (MSAs) as delineated by the United States Office of Management and Budget. According to these categories, large metro areas have a population of at least one million people; medium metro areas have a population of 250,000 to less than one million; small metro areas have a population of 10,000 to less than 250,000; and rural areas are defined as non-MSA areas.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Race</th>
<th>Gender</th>
<th>Type of Area</th>
<th>Type of practice</th>
<th>Region of United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarah</td>
<td>Caucasian</td>
<td>Female</td>
<td>Rural</td>
<td>Integrated</td>
<td>Midwest</td>
</tr>
<tr>
<td>Charles</td>
<td>Caucasian</td>
<td>Male</td>
<td>Rural</td>
<td>Integrated</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>Gaylen</td>
<td>Caucasian</td>
<td>Female</td>
<td>Small city</td>
<td>Integrated</td>
<td>New England</td>
</tr>
<tr>
<td>Julia</td>
<td>Caucasian</td>
<td>Female</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>Marian</td>
<td>Caucasian</td>
<td>Female</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>Helen</td>
<td>Caucasian</td>
<td>Female</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>Pacific Coast</td>
</tr>
<tr>
<td>David</td>
<td>Caucasian</td>
<td>Male</td>
<td>Medium Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>John</td>
<td>Caucasian</td>
<td>Male</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>Shirley</td>
<td>Caucasian</td>
<td>Female</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
<tr>
<td>Barbara</td>
<td>Caucasian</td>
<td>Female</td>
<td>Large Metropolitan</td>
<td>Neurofeedback only</td>
<td>South Atlantic</td>
</tr>
</tbody>
</table>
All participants worked actively in private practice. Three of the practitioners had an integrated practice, while seven offered primarily neurofeedback in their practices. I defined an integrated practice as one in which the practitioner divides time more or less equally between counseling and neurofeedback services. Most of the practitioners offered brief or solution focused counseling while receiving feedback from clients at the beginning of the neurofeedback session. If a traumatic experience is specific and well-defined, two practitioners offered Eye Movement Desensitization and Reprocessing (EMDR) with a client. One practitioner reported also offering brief, solution-focused therapy to families. However, if the focus of the practice is on neurofeedback services and not on psychotherapy services, and if clients typically supplement the neurofeedback they receive at the practice with psychotherapy services elsewhere, then I categorized the practice as neurofeedback only. If clients typically receive both neurofeedback and psychotherapy from the practitioner and therefore do not go elsewhere for psychotherapy services, then I categorized the practice as integrated.

Table 4.2 provides a description of participants’ professional licenses and certifications, educational degrees, experience, and client load, including the percentage of clients with trauma as an underlying issue. Six participants completed a doctorate as their highest mental health degree, three participants completed a masters degree, and one participant completed a bachelors degree. Participants with single mental health licenses or certifications included two licensed professional counselors, two licensed clinical social workers, two licensed psychologists, and one biofeedback and neurofeedback certified practitioner. Participants with multiple mental health licenses included one practitioner licensed in both counseling and psychology, one practitioner licensed in counseling and marriage and family therapy, and one practitioner licensed in the three disciplines of counseling, marriage and family therapy, and psychology.
Participants also held certifications in various other areas. One participant was a registered play therapy supervisor, two were certified in EMDR, and five held certifications in biofeedback and neurofeedback from the Biofeedback Certification International Alliance (BCIA).

Table 4.2

Demographic Overview of Participants: Professional information

<table>
<thead>
<tr>
<th>Participant</th>
<th>License or Certification</th>
<th>Highest Degree</th>
<th>Years of mental health practice</th>
<th>Years of neurofeedback practice</th>
<th>Average # of clients per week</th>
<th>Percentage of clients with trauma as central issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarah</td>
<td>LPC, LMFT, LCP, RPT-S</td>
<td>Psy.D</td>
<td>14</td>
<td>4</td>
<td>35</td>
<td>75%</td>
</tr>
<tr>
<td>Charles</td>
<td>LICSW</td>
<td>MA, social work, Ph.D. in another field</td>
<td>20</td>
<td>4</td>
<td>15</td>
<td>25% Combat PTSD: 6%</td>
</tr>
<tr>
<td>Gaylen</td>
<td>LPC</td>
<td>MA, Counseling</td>
<td>32</td>
<td>14</td>
<td>20 to 25</td>
<td>85%</td>
</tr>
<tr>
<td>Julia</td>
<td>LPC, LCP</td>
<td>MA, Counseling, Ph.D. psychology</td>
<td>20+</td>
<td>10</td>
<td>100+</td>
<td>30% (or more)</td>
</tr>
<tr>
<td>Participant</td>
<td>License or Certification</td>
<td>Highest Degree</td>
<td>Years of mental health practice</td>
<td>Years of neurofeedback practice</td>
<td>Average # of clients per week</td>
<td>Percentage of clients with trauma as central issue</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------</td>
<td>----------------</td>
<td>---------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Helen</td>
<td>BCIA-B, BCIA-EEG</td>
<td>BA, physics</td>
<td>N/A</td>
<td>21</td>
<td>40</td>
<td>50%</td>
</tr>
<tr>
<td>David</td>
<td>LPC, LMFT</td>
<td>MA, Counseling D. Min.</td>
<td>40</td>
<td>11</td>
<td>100</td>
<td>65%</td>
</tr>
<tr>
<td>John</td>
<td>LCP, BCIA-EEG, EMDR</td>
<td>Ph.D., psychology</td>
<td>30</td>
<td>15</td>
<td>20</td>
<td>35%</td>
</tr>
<tr>
<td>Shirley</td>
<td>LCP, BCIA-B, BCIA-EEG</td>
<td>Ph.D., psychology</td>
<td>31</td>
<td>15+</td>
<td>8-10 (semi-retired)</td>
<td>90%</td>
</tr>
<tr>
<td>Barbara</td>
<td>LPC, BCIA</td>
<td>MA, Counseling</td>
<td>25+</td>
<td>15</td>
<td>25+</td>
<td>30%</td>
</tr>
</tbody>
</table>

Participants’ years of psychotherapy practice ranged from 14 years to 40 years, with 25 years being the median. Their years of neurofeedback practice ranged from 4 years to 21 years, with 15 years being the median. The number of clients they saw per week ranged from more than 100 to 8 to 10, with 25 or more being the median. The percentage of clients with trauma as an underlying issue ranged from 95% to 25%, with 65% being the median.

**Individual Profiles**

The following section includes an individual profile for each participant. Each profile includes a narrative description of the major themes and subthemes that emerged from the initial face to face interview, the follow-up telephone interview, and the follow-up email. The narrative
description is followed by a chart depicting the themes, subthemes, and supporting information in a condensed form. Although the interviews with participants took place in the past, I have presented the results of my summaries of the interviews in the present tense. Using the present tense allows me to present participants as they presented themselves to me.

Participant #1: “Sarah”

**Introduction**

Sarah holds a masters degree in counseling and a doctorate in psychology (Psy.D). She is a licensed professional counselor (LPC), a licensed marriage and family therapist (LMFT), a licensed clinical psychologist (LCP), a registered play therapy supervisor (RPT-S), and a trained neurofeedback provider. She provided counseling services first in a group practice setting and then in her own private practice for 14 years. She began incorporating neurofeedback into her counseling services four years ago.

Sarah operated her private practice on the East Coast for 12 years. Several years ago she moved to the Midwest after completing a needs assessment that indicated that the area was underserved. She now lives and works in a town of approximately 3,000 people; however, she draws clients from a wide ranging area, some of whom drive for several hours to get to her office for neurofeedback training. She sees an average of 35 clients per week. Sarah’s practice is integrated in that she combines neurofeedback with traditional individual talk therapy, family therapy, and play therapy. Approximately 60% to 75% of her clients receive neurofeedback training in addition to these other forms of therapy.

Approximately 75% of Sarah’s clients have some form of trauma as an underlying issue. Other client presenting issues include depression (30%), anxiety (30%), autism spectrum (10%), attention deficit/hyperactivity disorder (30%), bipolar disorder (10%), sleep problems (30%), headaches/migraines (10%, usually comorbid with other issues), and traumatic brain injury (5%,
known). Other issues included relational issues secondary to drug and alcohol abuse and obsessive compulsive disorder.

I met Sarah six years ago when she agreed to be one of my supervisors in the process of acquiring the necessary hours toward licensure as a professional counselor in my state. She introduced me to neurofeedback, and I trained using her equipment. Due to geographical distance and the difficulty of travelling to her current location, I interviewed her face to face via Skype rather than travelling to her office.

**Individual Themes**

In order to provide a thick description of the participant’s input, detailed information regarding the interviews with Sarah are provided below.

**Practitioner.** Sarah had completed a doctorate in psychology and had been in private practice for approximately 10 years before hearing about neurofeedback from a depressed client who came to his first appointment with “dark circles under his eyes, beyond flat affect, and distraught looking.” Within 3 weeks he had improved “dramatically,” much more quickly than Sarah had anticipated. After the client told Sarah that he was also receiving neurofeedback training in a neighboring city, Sarah decided to investigate further by visiting the neurofeedback practice. There she spoke with a client, a young man who had been so debilitated by severe pain that he could not walk and was forced to discontinue his job as a professor at a nearby university. The client described how neurofeedback had alleviated enough of his pain that he was able to resume his teaching responsibilities and other daily activities. The dramatic improvement in her depressed client, in addition to the improvement in this pain client “pretty well sold” Sarah on neurofeedback.
Sarah approached neurofeedback with a mixture of feelings. She felt “shocked” that she had never heard of neurofeedback in all her educational years toward a doctoral degree. She describes herself as more of an “artsy” person who is a “bit computer shy.” To begin using electrodes, computers, monitors, and other electronic equipment was “pretty daunting to think about.” However, the potential to help people more quickly and more effectively than she had been able to do with talk therapy alone compelled her to take a “huge leap” that required more finances for training and equipment. The change was both “daunting” and “compelling.” Sarah says that “the notion of really being about to help someone in that way pulled me through.” Sarah underwent a “huge paradigm shift” and entered a “huge learning curve” in order to incorporate neurofeedback into her already thriving private practice.

According to Sarah, neuroscience research confirms the importance of relationship that she emphasizes in her practice. Sarah views the therapeutic process as first and foremost a relationship because she says, “people grow in relationships.” The interocellar interplay between mother and child stimulates the infant brain connections essential for brain development, and the importance of relationship continues as the individual matures. Sarah explains that the brain operates on a “needs met” hierarchy; therefore, the more settled the midbrain seat of emotions becomes, the more efficiently the prefrontal executive, problem-solving section can function. A deficit of nurturing, stable relationships has a detrimental impact throughout the lifespan. Therefore, relationship is an essential key to successful therapeutic outcomes, according to Sarah.

With her emphasis on relationship, Sarah was frustrated with diagnostic categories that may limit possibilities and become barriers rather than aids to successful treatment. A diagnosis that results in a life-long medication regime felt to Sarah like a “death sentence,” and she felt
particularly “sad” about the grim outlook for children labeled with a diagnosis. In addition, she says that the diagnostic categories are often inadequate and non-descriptive of the actual underlying issues, especially for people who have experienced complex trauma in childhood. Based on the neuroscience of brain development in relationship, neurofeedback was “intriguing” to Sarah because it utilizes symptom tracking rather than diagnostic categories to guide treatment and offers an alternative to endless medication.

Often the root cause is developmental issues, and I don’t have a category for that. They don’t give me interrupted development. This child was adopted from a foreign country wasn’t attended to... So it’s like okay... maybe PDD will work... maybe ADHD will work... maybe ODD will work but that is how it feels for me. Like technically, yep I can fit him in that box, but that is not really the crux of the issue. The crux of the issue is that we have this little boy from Bulgaria who had no stimulation in an orphanage and we are working with him to develop his prefrontal cortex and other parts of his brain to be retrained so that he can because that is how we grow with relationships... he had no opportunity. We are giving him that opportunity with neurofeedback and I don’t have a place to describe that process [#1, 467-476]

For Sarah, out of relationships with others comes a strong desire for service. Sarah has moved to an underserved area and says that she plans to make her practice into a training site. She is expanding her current property to include living quarters for an intern in the hopes of attracting others to this underserved area. She reasons that if she can get interns to the area, then they might see beyond the typical urban and suburban private practice destinations to consider the possibilities in an underserved rural setting. Through attracting more mental health
professionals, Sarah hopes to double or triple herself in order to better meet the needs of her underserved area.

Sarah uses every aspect of herself in service to the client. “My age works for me” is the way that she describes the trust that she is able to build with people, based on both her personal and professional experience. Through her years of experience as well as her openness to new modalities, she has acquired a “mix of skills” and a “big bag of tools” that serves clients well in her rural environment, where referral sources and specialists are fewer than in a large metropolitan area. She describes the process of acquiring these tools in preparation for working in this underserved area with a sense of destiny, of having been “directed into things.”

After taking the “huge leap” into neurofeedback, Sarah has become increasingly committed to integrating it into her counseling practice. Approximately 60% to 75% of her clients receive neurofeedback training in addition to the other forms of therapy that she offers. At this point, she says, “I don’t know what I would do without it.”

**Trauma Understanding.** Sarah’s commitment to neurofeedback is based on her knowledge of neuroscience and the “needs met” basis on which the brain works, as well as on her knowledge of how trauma has an impact on the brain. She explains that the prefrontal cortex will not develop adequately if people are unable to cope emotionally, not feeling safe in themselves or safe in the world. Trauma tends to result in a “coping deficit” that is often misdiagnosed.

Sarah’s understanding of trauma and its impact encompasses more than the one-time traumatic event defined by PTSD; it extends to the concept of complex trauma, stemming from early childhood attachment disruption, abuse, neglect, and other deleterious situations that take place over a period of time. Drawing on Erikson’s developmental model, a person who
experiences early childhood trauma can get “stuck” at a particular stage, and Sarah can guess at which stage the trauma occurred by observing the person’s “way of being” in the world. One common trait of early childhood trauma survivors is “not being in relationships appropriately.” Ongoing early childhood trauma results in living in continual survival mode so that the prefrontal cortex, the seat of problem solving skills, does not develop adequately. This inadequate development produces a deficit of coping skills that often results in a chaotic lifestyle that can be re-traumatizing throughout the lifespan.

We have trauma due to these chaotic lives...like children weren’t protected...they don’t have coping skills because nobody taught them...so the world is a daunting place because they are traumatized...they could be labeled borderline or bipolar...their lifestyles are traumatizing...out of control...imagine a world where you don’t have the psychological capability to cope with life...the day to day stressors of life...therefore life is chaotic and traumatic...you have no skills. [#1, 421-432].

According to Sarah, neurofeedback calms the brain so that the person feels more settled in the world. As a result, the prefrontal cortex can more effectively assist the person to cope with life stressors and to solve problems rather than simply react in a chaotic manner.

**Therapeutic process.** The therapeutic process begins with an initial assessment in which Sarah is aware that trauma may be an underlying factor in any current symptom or previous diagnosis. The therapeutic alliance involves building a relationship that creates a “safe place” in which to process. The physical environment also contributes to the feeling of safety. Sarah’s office is located in a renovated church building, with stained glass windows several blocks from the center of her small town. Sarah says that the building, the décor, and the family business atmosphere provides a “safe, welcoming” environment that is a “huge factor” in the therapeutic
process. Sarah attempts to create an atmosphere that makes people feel cared for because “anecdotally we learned that people are not used to being treated with care.” Safety allows the person to process difficult issues and feelings as they surface. One of the topics that must be processed is the fear of change that therapy may trigger, since “health is scary sometimes.”

Sarah has incorporated neurofeedback into an already existing practice that included counseling services, educational and psychological testing, couples and family therapy, and play therapy. She continues to use all these skills in addition to neurofeedback. With children, she divides the session in half so that she can include both neurofeedback and play therapy. The play therapy “gives another eye” to observe “how they are in the room.” She can observe the child’s overall “maturity level,” and if the child is “chaotic,” or “clumsy.” This information helps her to guide neurofeedback protocols. Since change is not likely to occur in an unchanged chaotic environment, Sarah attempts to have an impact on the family system, particularly when treating children. She takes time to speak with parents.

Sarah’s choice of neurofeedback protocol for trauma is informed by her neuroscience knowledge as well as her intuition and observation skills. She starts training the right side of the brain for calming but is flexible in changing the protocol depending on her own observations as well as the feedback she receives from multiple sources, including the client, parents, teachers, or others. The neurofeedback process is one that includes constant feedback and reassessment. One factor that Sarah finds to be particularly valuable in neurofeedback is that she can actually show clients on a monitor how their brain is controlling the training process. The client is “in control” of the neurofeedback training process, which Sarah says is “great for people who have experienced trauma.” Sarah may or may not use alpha-theta, depending on the situation.
Neurofeedback training involves more than creating training protocols based on symptoms. Sarah describes the balance between art and science as being a 50/50 split. An intuitive sense is needed to create the safety that is a “huge factor” in the brain allowing traumatic issues to surface in order to resolve them. There is an “intuitive sense,” there is “art” that takes “patience” and a “sense of timing” in adjusting protocols and sensing the client’s readiness. There is art as well as science in successful treatment, and “You can’t divorce from the machine.”

Therapist self-awareness is a vital element in neurofeedback training as well as in traditional talk therapy. Sarah described herself as coming from a “chaotic background,” so she is aware of the potential for transference issues, realistic about the time required to work through issues, and therefore patient with people. She describes the necessity of “being aware of your own issues” as well as being aware of “what is going on in the room.”

In her rural setting, Sarah finds herself increasingly stretched in new clinical situations. She is treating adopted children with attachment issues, children with “severe brain injuries and speech disorders,” autism spectrum disorder, and a variety of other “more difficult cases.” Continuing education through strong mentoring relationships, continued study, and participation in a neurofeedback email listserv are all important aspects of her professional practice. She informs clients that she participates in these networks, and she feels that knowledge gives the client a safety net, thereby increasing trust in the neurofeedback process.

With a strong mentor who is both available and “approachable,” Sarah is able to meet the needs of clients that she would have hesitated to take on previously because she knows that she is “not here alone.” If her mentor says, “we can do this…I do it.” Sarah described one incident in particular in which her mentor encouraged her. A child “threw up on my carpet the first day
and I thought I can’t do this.” Her mentor told her, “it happens all the time…you can do this…you will be surprised what we can get done.” By drawing on a mentor’s “years of experience and expertise and encouragement” Sarah handles situations that she “would normally just shy away from.” The theme of lifelong learning, risk-taking and the willingness to go out of her comfort zone to help others repeatedly surfaces.

Sarah explains that when a client is on medication, cooperation with medical professionals is essential. As neurofeedback training improves the flexibility and stability of brain functioning, the brain begins to do by itself what the medication had been helping to do. Therefore, the client may “have an adverse reaction to their medication because now it is too much.” Sarah has a relationship with a nurse practitioner who is willing to adjust medications in response to neurofeedback symptom changes brought about by neurofeedback treatment.

Years of experience have made Sarah “a little wiser” concerning therapeutic limitations. Although she says she is frustrated when people walk away from therapy after getting better, she says, “I am willing to let them have their process.” The therapeutic alliance depends in part on how far people are willing to go in the change process, how much they are willing to face “the fear of success,” and Sarah says that she accepts the limitations in that process because “it doesn’t matter how skilled you are…you can bring them up to a certain point and they decide they are going no further, so they disappear.” Whereas in the past Sarah wondered “what did I do wrong?” she indicates she now believes that “in many cases, it’s just where they are.” The fear of success can interrupt the therapeutic process.

Although there was no direct question related to it, one theme that emerged was that of business practices. Practical business aspects provide the foundation for the therapeutic processes. Sarah has a technician helping with the neurofeedback so that she can at times
schedule two clients in one hour. She divides her time between play therapy for children and counseling for adults, and oversees the neurofeedback portion by writing the protocols for the technician to follow. In this manner, she is able to consistently handle 35 clients per week, a number that helps the practice to “stay afloat.” She works evenings one or two nights per week in order to accommodate the schedules of school children as well as people who are driving a long distance to get to her.

**Client Factors.** Client Factors for Sarah include family systems, motivation and medication. According to Sarah, if a client continues to live in a chaotic family system, the impact of the neurofeedback training will likely be lessened. Sarah did not view multicultural factors as influencing the treatment process, specifically stating that “age is not an issue.”

Sarah describes the motivation necessary for clients to improve their functioning as “you gotta have a want to.” Clients have to be able to “grab hold enough to want to help themselves” or neurofeedback will not be effective. Having the “want to” entails facing pain and fears of change since change, even change for the better, may not always a positive thing. “There is a large fear…the fear of success…Getting better is not always a real positive thing for people. It can be a very frightening thing if you’ve lived in chaos all your life” [2, 160-169]. Clients who fear change and who will not work through that fear tend to terminate treatment prematurely.

Sarah indicated that the client’s relationship to medication also influences treatment outcomes. As neurofeedback improves the flexibility and stability of brain functioning, the brain begins to do on its own what the medication has been doing; therefore, the client may need to decrease medication. If clients feel safer with medication than without it, they may drop out of neurofeedback training. It seems that some people feel safer taking medication, even though the “side effects of medication are huge” compared to the minimal side effects of neurofeedback.
**External Factors.** Sarah viewed the medical community as being both a positive factor and a negative factor in the neurofeedback process. The American “culture of medication” tends to produce the thinking “take a pill and be fixed.” Clients with this thinking are often not willing to invest the time necessary to get results with neurofeedback.

From the medical professional standpoint, Sarah has encountered some medical professionals who believe that neurofeedback can improve functioning, and who therefore cooperate with adjusting client medication needs. However, some medical professionals may discourage clients from either trying neurofeedback or staying with the process. Sarah describes some of the medical community as being either “contentious” or “dismissive” of neurofeedback, thinking of it as “a ridiculous kind of flaky alternative,” “like voodoo,” so that “you really can’t have a discussion” about it. When a medical professional will not coordinate treatment with a neurofeedback provider, the treatment process is hindered.

Progress in the wider neurofeedback field also has an impact on treatment outcomes, according to Sarah. She mentioned the current controversy in the neurofeedback field concerning the effectiveness of high frequencies versus low frequencies in training. Although she stated that she doesn’t know “where the field will land,” she is convinced that neurofeedback is becoming more well-known by the general public and more accepted by members of the medical profession. Some neurofeedback providers believe that “this is the year the tide is beginning to change,” so that neurofeedback will move out of the fringe area and take its place among the mainstream treatment modalities. Sarah says that psychiatrists have attended the neurofeedback trainings, and some medical professionals are willing to coordinate client treatment with her.
Summary

Relationship is the core theme for Sarah. Many other themes revolve around relationship and service to others. Sarah was willing to take a “huge leap” into neurofeedback because she witnessed its efficacy in helping others. She defines trauma primarily in relational terms, as a “developmental insult” of betrayal in relationships, and that understanding guides her holistic practice. She designs her private practice environment to provide an atmosphere of safety, an essential factor in the therapeutic alliance. Hindrances to effective outcomes may also be relational, as a chaotic family system will hinder progress. External factors that have an impact on neurofeedback outcomes include the culture of medication and attitudes toward neurofeedback, both from the medical community and the general public. The themes that emerged in the interviews with Sarah are displayed in Table 4.3
### Analysis of Participant #1: “Sarah”

#### Table 4.3

Themes, Sub-Themes, and Supporting Information

<table>
<thead>
<tr>
<th>THEME</th>
<th>SUB-THEMES</th>
<th>SUPPORTING INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practitioner</td>
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<td></td>
<td>Risk-taker</td>
<td>“huge leap”</td>
</tr>
<tr>
<td></td>
<td>Relationship</td>
<td>Sense of destiny</td>
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<td>Neurofeedback (NF)</td>
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<tr>
<td></td>
<td>Commitment</td>
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<td>Trauma Understanding</td>
<td>Neuroscience knowledge</td>
<td>Chaotic</td>
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<td>NF protocol</td>
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<td>Limitations</td>
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<td>Business practices</td>
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<td>Client</td>
<td>Motivation</td>
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<td>Fear of change</td>
<td>“take a pill and be fixed”</td>
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<td>Medication</td>
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<td>External Factors</td>
<td>“Culture of medication”</td>
<td>“where the field will land”</td>
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<tr>
<td></td>
<td>Neurofeedback field</td>
<td></td>
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</table>
Participant #2: “Charles”

Introduction

Charles has a diverse background that includes military service, political science and international relations studies, travel abroad, and multicultural experiences. He has a Ph.D. related to international studies. After a career change and with the help of a grant, he became involved in curriculum development for staff training programs at long term care facilities for the gerontological population. The training programs taught a holistic approach to health, and the research outcomes were subsequently published. While teaching several courses at a theological school on caring for the gerontological population, he decided to complete a masters degree in social work. He has been a licensed independent social worker (LICSW) for seven years, although he has 20 years of experience working with people in various educational and clinical settings. He incorporated neurofeedback into his private practice four years ago.

Charles operates his private practice in a rural town of approximately 4,000 people. He offers intensive weekends of neurofeedback training at his office for those who travel to him from several hours away. In addition, he has assembled a portable neurofeedback kit so that he can travel to those who have difficulty leaving their homes. He integrates talk therapy, play therapy, and massage into his practice, and he uses neurofeedback with approximately 70% of his clients. He sees approximately 15 clients of all ages per week.

Approximately 25% of Charles’s clients have some form of trauma as an underlying issue. This figure includes approximately 6% with combat related PTSD. Other client presenting issues include depression (20%), anxiety (25%), autism spectrum (5%), attention deficit/hyperactivity disorder (20%), bipolar disorder (5%), chronic fatigue/fibromyalgia (5%),
sleep problems (10%), headaches/migraines (2%), and traumatic brain injury (2%). Many of these issues are associated with underlying trauma.

I drove out of state on the Monday of a long holiday weekend to interview Charles. At his suggestion, I met him and his wife at a Chinese restaurant in their small town for dinner the night before the interview. After dinner, I followed their car for several miles on a winding country road and then down a long dirt lane to their house in the woods. We drank tea, played games, and chatted the rest of the evening. The next morning I followed Charles to his office in the center of town, and we walked up the wooden steps of an old building to the second floor. The office is a large room with neurofeedback equipment in one corner, a sofa against one wall, and toys stacked against the opposite wall. Tall windows line another wall, making the old high-ceiled room sunny and cheerful. The windows were open, and I could hear the low noise of traffic on the street. Charles’s wife, a counselor, occupies the room next to his. After observing Charles with his first client of the day, we began our interview. During the interview, several people in the office building dropped by to say hello, and several clients called for appointments. The atmosphere seemed friendly, slow-paced, and informal. We later bought a take-out lunch to eat in the office while Charles helped me download some updates to my neurofeedback system which I had brought with me, knowing that our systems were identical. After the interview, lunch, and the downloading of updates to my neurofeedback system, I started the drive home late in the afternoon.

Individual Themes

The following section provides a description of the themes that emerged from the interviews with Charles.

Practitioner. Charles’s openness to new experiences has made him a lifelong learner. His diverse educational and professional background include travel, numerous multicultural
experiences, and working with various age groups. At one point, Charles left his job and “went on a spiritual search...a mission, not a search.” It was during that time that he was trained in alternative methods with a holistic approach. This holistic approach is evident in the mind-body emphasis in his current practice that includes discussion of topics such as nutrition and massage, and techniques such as visual imagery. Charles described being on the “cutting edge” in several of his jobs. He is willing to take risks in order to pursue new ventures, and his risk-taking ability led him to try neurofeedback.

Charles said that he learned about neurofeedback while teaching a continuing education course on attention deficit/hyperactivity disorder (AD/HD). After hearing him speak primarily about medication as a treatment for AD/HD, several participants informed him about neurofeedback as an alternative treatment. Charles describes himself as being “always open-minded...I am going to investigate it until I can either prove it to be either bunk or that it works.” After hearing about neurofeedback as an alternative to medication, Charles decided to investigate by first observing and then experiencing the training for himself. He then integrated neurofeedback into his practice at the age of 66. Now 71 years old, Charles is still researching, teaching, and finding innovative ways to serve his community by singing in a community chorale and volunteering as a tutor. He has no plans to retire: “I’ll retire when I fall over or when I get Alzheimer’s.”

Charles is committed to neurofeedback as an integral part of his practice. He says that he “bought in very quickly” so that when his son was experiencing depression along with a range of other problems, Charles paid for his son to receive neurofeedback training from a practitioner in another state. Charles described this decision as “the best investment I ever made...his whole
Integrating neurofeedback into his practice was not without problems. Charles describes the “steep learning curve,” and the technological challenges that accompany neurofeedback practice. He said that he “sweated blood” for the first few months of the integration process, wondering “is this going to work,” and feeling “constantly underwater.” Despite these challenges, Charles says that he never thought of abandoning neurofeedback as a piece of his practice. He had personally witnessed dramatic changes in his son, and he had made his decision. Since there was no one nearby who could supervise him, Charles sought supervision from a distance. He continues to participate in regular supervision though consult calls with other practitioners, participation in an email listserve, and attending conferences and trainings.

**Therapeutic Process.** Charles discussed the importance of establishing and maintaining a therapeutic alliance, especially with trauma survivors. With children, he builds the alliance by getting down on the floor and playing with them, and he uses play to gauge their readiness to cooperate with the neurofeedback process; with teenagers he builds the alliance by talking about their interests or listening to and discussing their music with them, as a way of gaining insight into their thoughts and feelings; with adults, he builds the alliance by having an “empathic ear,” and by demonstrating acceptance. The alliance continues to be strengthened as he receives feedback from the client every session and makes adjustments accordingly.

Charles told one story that dramatically demonstrates the strength of the therapeutic alliance, his willingness to go beyond normal therapeutic limits to care for clients, and his willingness to follow his intuitive sense. One day he had a strong inclination to call a client whom had been seeing for posttraumatic stress disorder. As it turned out, the inclination came
just at the time that the client had decided to commit suicide. The client told Charles that he had a gun in his hand, ready to shoot himself when he recognized Charles’s number on the caller ID and decided to pick up the phone. The client immediately came to Charles’s office.

Charles has an integrated practice so that he divides the session between 20 minutes of talking and 30 minutes of neurofeedback. He sometimes offers neurofeedback to both parent and child, in order to calm a parent’s anxiety so that the parent can better regulate the child’s emotions. Approximately 70% of his clients receive neurofeedback training in addition to traditional talk therapy. Charles does not use neurofeedback as a stand-alone treatment modality.

An understanding of trauma underlies the therapeutic process. Charles was cognizant of the connection between trauma and somatic as well as psychological symptoms. He also discussed survivors of sexual abuse holding onto a sense of “body shame.” Although he was aware of the sequelae of complex trauma, he focused generally more on the overarousal symptoms of posttraumatic stress disorder: “explosive temper, poor concentration, poor memory, panicky feelings, feeling overwhelmed, trembling inside and out, obsessive compulsive disorder, can’t stop thinking the same thoughts, very sensitive to criticism, worrying a lot, suicidal thoughts.” His understanding of the need to calm the neurological system informs his neurofeedback practice.

According to Charles, one benefit of using neurofeedback with trauma survivors is that they do not have to discuss the traumatic experience. Clients can discuss the trauma as therapy progresses if they find the discussion helpful; however, neurofeedback can calm down the neurological hyperarousal without that discussion. This fact helps trauma survivors to accept neurofeedback as a treatment modality, since talking about the traumatic experience may be too painful, especially at the beginning of therapy.
Charles provides a thorough induction into the neurofeedback process. With both children and adults, he explains the equipment and allows them to touch the electrodes. Charles observed that this induction alleviates fear of the technology, thereby making the client more comfortable. As part of the preparation, Charles asks clients to schedule two to three appointments per week for the first several weeks. He reasons that the sooner clients feel results, the more confident they will be in the process, and therefore the more likely they will be to complete it.

Charles asks for feedback at every session. The feedback includes both verbal feedback and a symptom tracking sheet, which provides a more objective written measure of neurofeedback effects. Charles stated that the potential effect of this constant feedback is to increase self-awareness as well as confidence in the process. After obtaining feedback from clients, Charles is flexible in changing the training protocol, if needed: “You can’t just rely on doing the same ole same ole...you’ve got to customize to meet each person’s individual needs.” Charles has realized that each person is different, and so knowledge of the general is not enough. The practitioner must have the “connection” with the client and an “intuitive sensing of where the person is and what they need” in order to provide effective treatment.

Charles uses both awake state and alpha-theta deep state training as part of the protocol for trauma survivors. He generally completes at least 10 sessions of awake state training first, primarily on the right side of the brain for calming. Before starting alpha-theta, he completes and induction that includes teaching on deep breathing techniques for further relaxation and going through a visual imagery script. Since alpha-theta purportedly draws on the deeper areas of the brain where traumatic memories or feelings are encoded, providing alpha-theta training may bring up disturbing memories or feelings. Therefore, Charles tells clients that these
memories will come up only if they are ready; he assures clients that they are “in control” of the process so that the memories will not be re-traumatizing.

With people who have got severe trauma backgrounds I will say something like...you may or may not according to whether you are ready find that some images from your trauma past may float up and be on that screen but they will not upset you... they will just be as if they are on a screen without the emotional sound effects. But this will happen only if you are ready... so if you want to allow that it may come... or it may not... so giving them permission but I want to make it in such a way that it is not retraumatizing.

In Charles’s experience, the awake state training combined with deep state alpha-theta training generally produces effective results in terms of calming the overarousal that typically accompanies traumatic experience.

Charles observed that counseling and neurofeedback may not provide the entire answer to all problems. Sometimes there are toxic chemical effects on the brain, sensory integration issues, allergies, and other things that must be attended to. Charles has a wide range of knowledge on these other issues and will refer to other professionals if he senses the need.

Charles is a reflective practitioner who was just as willing to share his neurofeedback mistakes and failures as he was his successes. He discussed his mistakes in sometimes changing electrode sites too soon or too often, a practice that he believes may have resulted in less than optimal results: “It certainly did not turn out the way that I had hoped or the way we had hoped.” He has learned from those mistakes and has adjusted his practice. He has also learned to be more cautious in what he promises clients: “So it’s making me be a whole lot more cautious about saying yes I think we can handle that one”... “you don’t always get what you want.”
**Client Factors.** Charles named financial concerns as the main client factor that hinders effective treatment. Although some insurance companies will pay for neurofeedback training, the insurance often runs out before the training is complete. Therefore, Charles sometimes offers a sliding scale, accepting the equivalent of a co-pay or charging clients as little as $5 a session. He finds that sometimes, however, even the low cost will not hold clients in treatment, as they become impatient with the minimum 20 training sessions suggested for evaluation of effectiveness. Sometimes medication seems like the faster, more effective treatment option, especially if clients must travel a distance to his office. Lastly, Charles noted client ambivalence as a factor that affects treatment outcomes. He noted in particular that sometimes clients with bipolar disorder symptoms do not want to give up the manic cycles, and those with borderline personality symptoms may not truly want to move toward health.

The only multicultural factor that has an impact on treatment outcomes is socioeconomic status. Clients who cannot pay for services either will not start or will not continue neurofeedback.

**Neurofeedback Field.** Charles noted the current controversy in the neurofeedback field concerning high versus low frequency training. He stated that this controversy may influence treatment outcomes, since new equipment is being developed and new protocols researched that may prove to be more effective than those currently available. The controversy also indicates that the field is growing and therefore may become more mainstream in the future. Charles thinks that more clients may be attracted to neurofeedback if it becomes a mainstream treatment.

**Summary**

Charles has adjusted his private practice to meet the needs of his rural community. He operates an integrated practice in which approximately 70% of his clients receive neurofeedback
training in addition to traditional counseling and play therapy. Charles’s searching, active, and life-long learning attitudes led him to explore neurofeedback. His commitment to neurofeedback is based on his personal observation of dramatic change in others. He has a wide range of knowledge in other areas in addition to a holistic approach, so that he refers his clients to other professionals when necessary. His knowledge of trauma informs his neurofeedback practice. Although he is aware of the limitations of neurofeedback, he stated, “I think it’s the most interesting most challenging work I’ve done probably in my whole life.” Charles’s prominent themes are displayed in Table 4.4.
Analysis of Participant #2: “Charles”

Table 4.4

Themes, Sub-Themes, and Supporting Information

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<tr>
<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
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<td>Practitioner</td>
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<td>Spirituality</td>
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<td></td>
<td>Risk-taker</td>
<td></td>
</tr>
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<td></td>
<td>Neurofeedback (NF) commitment</td>
<td>“Sweated blood”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Steep learning curve”</td>
</tr>
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<td>Therapeutic alliance</td>
<td>Preparation/scheduling</td>
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<td>Integrated practice</td>
<td>Constant feedback</td>
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<td>Trauma understanding</td>
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<td>NF protocol</td>
<td>“Intuitive sensing”</td>
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<td>“You don’t always get what you want”</td>
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Participant #3: “Gaylen”

Introduction

Gaylen completed a masters degree in counseling and is a licensed professional counselor (LPC) in her state. In addition, she has completed training in Dialectical Behavior Therapy (DBT) and holds Biofeedback Certification International Alliance certification in neurofeedback (BCIA-EEG). She has been in private practice for 33 years and has also worked in other clinical settings, such as a residential treatment center for severely disturbed adolescents. She began integrating neurofeedback into her counseling practice 16 years ago, after experiencing dramatic changes in her own life from neurofeedback training. Gaylen regularly attends and presents at conferences and has also published articles describing her experiences treating trauma survivors.

Approximately 85% of Gaylen’s clients have some form of trauma as a central issue. Other presenting problems include the following: depression (70%), anxiety (95%), autism spectrum (1%), attention deficit/hyperactivity disorder (5%), bipolar disorder (10%), chronic fatigue/fibromyalgia (15%), sleep problems (75%), and headaches/migraines (35%). Many of these psychological and somatic issues are comorbid. She currently sees approximately 20 to 25 clients per week.

Individual Themes

The following section contains a narrative description of the themes that emerged in the interviews with Gaylen.

Practitioner. Gaylen described herself as being generally “curious” and “open.” In both her personal and professional life she has been motivated toward growth. Earlier in her career she was searching for more effective means to treat children with attachment disorders; she attended Marsha Linehan’s first class on Dialectical Behavior Therapy (DBT); she was the first
person to institute DBT in a residential treatment center. One path to growth was through spiritual practices such as Buddhist meditation. Another path that revolutionized her life turned out to be neurofeedback.

When Gaylen first heard about neurofeedback, she thought of it as “high tech snake oil” because she had no paradigm with which to understand it. Then in 1996 a friend who had purchased her first neurofeedback system asked Gaylen to be her first subject. After several sessions did not make any noticeable changes, her friend trained her for seven hours over one weekend. Some of the unexpected changes were “scary” to both Gaylen and her friend; however, after several days both Gaylen and others noticed her “dramatic reduction in fear” and the absence of her typical startle response. Gaylen remembered that other changes included an internal experience of “exquisite vulnerability,” “oneness,” and “calm” that were difficult to describe. She described suddenly feeling more in touch with both natural beauty and “egregious violence.”

Gaylen “became a believer.” Several months later she attended a neurofeedback training seminar where she heard other stories of dramatic improvements. These stories convinced her that her experience was not unique to her, but could be universalized to help many other people. Although she understood little of the theory (“You don’t really need theory when you see it yourself”), neurofeedback became so “compelling” that she mortgaged her house in order to purchase her first neurofeedback system. At first she intended to use it only on herself and her family; however, a client who felt herself spiraling into a deep depression so fast that it was “terrifying” her, asked Gaylen to try neurofeedback as an alternative to medication. The results were immediate and lasting. After that experience, Gaylen “never looked back.”
Gaylen described herself as a “poster child” for all that neurofeedback can address. She had a history of childhood trauma and traumatic brain injury, temporal lobe epilepsy, temporal lobe seizures in both lobes, and migraine headaches. It has been a “long journey,” but as a result of neurofeedback, she now has “no manifestations of head injury, no seizures, no migraines, and no PTSD.” Gaylen has completed approximately 1,500 sessions of neurofeedback training on herself. She describes her understanding of neurofeedback as being “from the inside out.”

Neurofeedback lives at the intersection of Gaylen’s personal and professional life. She says that she has a “neurofeedback family” in which everyone trains. Her husband has been involved with some organizational business aspects. Gaylen describes herself has having a “robust personal life and a robust professional life” that feels very well “integrated.”

In her professional life Gaylen has undergone an evolving understanding of “what it means to be human” and therefore what is necessary in the therapeutic process. She began her career with a psychodynamic orientation and in the early 1980s had a “revelation” while counseling a boy who had attempted to kill his foster mother. When he made very little progress even after six years of treatment, Gaylen underwent “a huge turning point” in terms of the way she understood the “challenges of treatment.” It was then that she was introduced to attachment theory, a theory that gave her a new orientation. She realized that the root causes of these severe problems stemmed from the trauma of attachment disruption early in life, a relationship trauma that would be difficult to repair even in very young children because they did not know how to attach to the therapist.

Because they had no…nothing but a kind of vague nonspecific negative kind of transference but it was really much more…really the therapist doesn’t really exist and so there was no relational leverage…it was an awful process of ghosting.
Gaylen said that her understanding of how fundamental healthy attachment is to overall human development, as well as how difficult it is to repair that process once disrupted, provided the impetus for her to later explore and integrate neurofeedback into her practice. Neurofeedback would provide the key to the neurological system that regulates human emotion, thereby allowing humans to attach to each other in ongoing relationships.

Gaylen continues to invest in herself through continuing education. She emphasized the importance of mentoring. She regularly attends conferences and seminars; she participates in neurofeedback email listserves; she reads a wide range of journals, newspapers, and other literature; she mentions the research of Bessel van der Kolk in the trauma field, Alan Schore in the attachment field, Winnicott’s concept of the “good enough mother,” Dan Siegel’s notion of a “coherent narrative,” and Frank Putnam’s research on the direct and indirect costs of developmental trauma to society; and she has long-standing relationships with other professionals with whom she regularly shares neurofeedback experiences and exchanges protocol ideas. In fact, in her opinion, a salient characteristic of experts who are the best in the field is that they “are always looking for new approaches” as they frequently consult with colleagues.

Gaylen also invests in the lives of others. She presents at conferences, she publishes articles, she plans to write a book, and she trains others in neurofeedback. Her desire to mentor others in the field became evident to me as I arrived at her office early for our first interview. She immediately made me comfortable in her office and freely shared personally and in depth for two hours. During the interview, she offered to send me powerpoint presentations on trauma. At the end of our second interview, she turned the interview around to inquire how the interview
process and all this information had affected me. She is invested not only in her own practice, 
but also in the growth of others.

Finally, Gaylen is a reflective practitioner who analyzes her mistakes as well as her 
succeses. She spoke of using the alpha-theta protocol with one client diagnosed with borderline 
personality disorder who had been sexually abused as a child, with textbook results of trauma 
resolution. However, the same technique with another client had deleterious effects. The client 
arrived at her next appointment “frightfully disheveled” and had deteriorated in caring for 
herself, her pet, and her house. In her later analysis, Gaylen realized that the first client had 
some comfort to draw upon in her earliest memories, whereas the alpha-theta had taken the 
second client to earliest nonverbal memories of abandonment with no comfort. The client 
became more wary of therapy, and Gaylen learned that the therapeutic alliance, particularly with 
trauma survivors, is a fragile and tentative connection. Gaylen stated that she had other stories 
that were best not told for my dissertation because they are “pretty wild.” However, the fact that 
she has “pretty wild” stories to tell suggests that she has created a safe enough environment and 
built a strong enough therapeutic alliance that her clients can tell their most traumatic stories.

**Trauma understanding.** When Gaylen talks about trauma, she is usually referring to a 
potentially new diagnostic category called *developmental trauma disorder*, one that will undergo 
a field trial to determine its inclusion in a future *DSM*. According to Galen, this category is 
“much more descriptive” of the consequences that follow childhood abuse or attachment 
disruption than any of the current diagnoses. It is a “whole body diagnosis,” descriptive of the 
fact that early childhood trauma causes disruptions in “every system of cognitive, learning, 
behavioral, emotional, and physiological [domains].” Gaylen thinks that this new category will 
likely clarify the current confounding diagnoses of bipolar disorder, attention
deficit/hyperactivity disorder (AD/HD), posttraumatic stress disorder (PTSD), and reactive attachment disorder (RAD).

Gaylen emphasized that developmental trauma is rampant and can take many forms. She cited a statistic published by the Center for Disease Control indicating that developmental trauma costs society 1.4 billion dollars per year in direct and indirect costs. According to Gaylen, the cost is even greater than that, since the “vast majority” of Gaylen’s clients “were severely traumatized as children” but “never made it into that statistic” because “they soldiered on as kids and collapsed as young adults.” Much of the cost of developmental trauma stems from the myriad of emotional and physical problems engendered by a fear-based neurological system. In therapy, Gaylen is trying “always to be quieting fear” that can take many forms: irritable bowel syndrome (IBS), panic, constipation, dissociation, flashbacks, hallucinations, high levels of reactivity, rages...tensional problems, learning difficulties, stomach problems, chemical sensitivity, fibromyalgia, chronic fatigue, obesity, eating disorders, borderline personality disorder, cutting, self-abuse, suicide, or suicide ideation.

All these problems with emotional disregulation result in “lots of requests for the therapist to regulate affect,” and those requests “burn out therapists” in a traditional talk therapy situation. The client often asks the therapist to “please help me stop feeling so awful” by “making the therapist feel awful,” so that the therapy “usually doesn’t work very well.” In Gaylen’s experience, neurofeedback can regulate the neurological system without stirring up the intense transference and countertransference issues typical of talk therapy.

Neuroscience knowledge. Gaylen’s understanding of trauma from the developmental perspective is intertwined with her knowledge of neuroscience. Under normal circumstances, the brain begins to regulate itself in the presence of a “good enough” mother who is attuned to the
baby in a “rhythmic relationship” that regulates the baby’s emotional states until the baby has the capacity to handle the regulation on his or her own. If that early regulation does not happen due to abuse, neglect, or some other form of attachment disruption, emotional states can run rampant, causing disruption in every domain of functioning. Gaylen stated that the most important thing that she has learned in her years of counseling practice is the relationship between the neurology of the brain and human behavior, a topic surprisingly absent from her graduate studies.

The most important lesson that I’ve gotten has been that the core of all of our psychological problems rest in the firing of the brain in some way if we can access the brain... That all mental processes sit on top of this and that we have access to it... In neurofeedback you see an evolution of... the mind as the brain regulates itself... so it revolutionized my view of the way that we are human... there are rigidities and chaotic places... and how we can reach and that they are imprinted in some way in this web that is mysterious of neuronal and glutal networks.

Due to her understanding of the brain’s neurological firing patterns, Gaylen does not use cathartic therapies. The neurological principle of “what fires together wires together” means that the more the brain’s circuits go down traumatic paths, the stronger those paths become. Gaylen emphasized that neurofeedback offers a method of training new brain patterns instead of reinforcing old traumatic ones.

**Therapeutic process.** In Gaylen’s experience, the therapeutic alliance is crucial to the therapeutic process. From the therapist’s side of the therapeutic alliance, all the factors that compose good clinical work are also important in the integrated practice of counseling and neurofeedback. These factors include the therapist’s empathic qualities, the alliance, and the ability to create a ‘holding environment.” From the client’s side of the therapeutic alliance,
Gaylen stated that she has had to rethink her conceptual framework of mental illness in the context of “the brain becoming mind.” She now thinks of concepts such as defenses, resistance, and transference in the context of the brain’s underlying neuronal firing in the subcortical limbic areas that house emotions. The primary underlying emotions that “derail” therapeutic interactions, and therefore the therapeutic alliance, are the client’s fear, terror, shame, anger, or rage that become aimed at the therapist. These core emotions, not reached primarily through talk therapy, may elicit strong countertransference responses in the therapist who feels attacked.

According to Gaylen, neurofeedback can access the “subcortical drivers” that fuel the strong effects that so often derail therapy, and thereby facilitate a “transference cure.” When affect is calmed, a strong and enduring therapeutic alliance is more likely occur, although with trauma survivors, the alliance grows slowly and is always fragile, as Gaylen learned with the client who had a detrimental experience with alpha-theta.

Gaylen is clear in her opinion that neurofeedback must be accompanied by counseling for maximum effectiveness. “Neurofeedback is never to me a stand alone.” In addition, her experiences with transference and countertransference reactions have convinced her that treating trauma survivors with talk therapy alone is futile. She says that she “ethically can’t treat trauma without neurofeedback” because for trauma survivors “psychotherapy is lame.”

Gaylen’s integration of counseling and neurofeedback is based on her neuroscience knowledge of the right and left brain hemisphere functions. According to Gaylen, neurofeedback can “organize the right hemisphere” in order to calm the “wild affect” so that talking about the trauma does not rekindle emotional disregulation. Talking, which is from the more logical and linear left brain hemisphere that is not as reactive, can be an “exit route” from the traumatic experience by placing it in a linear time of the past. Right brain calming plus left
brain talking provides the “exit route” that gives trauma survivors a past so that trauma “becomes part of the biography as opposed to what you are living out.” If talking serves the goal of regulation, then Gaylen will talk to the client about experiences that caused the disregulation. However, if talking makes the client more disregulated, then she knows that the “CNS [central nervous system] is not ready for that conversation,” and she will back away from talking about specific traumatic experiences.

The goal of the integrated practice is regulation and relationship. Neurofeedback helps to regulate the neurological system so that the person can establish safe attachments to other human beings. It helps to put the person in the “human domain” of experiencing empathy, vulnerability, and all the “complexities” that make us human. The counseling relationship is necessary to support the changes that the neurofeedback training is facilitating in the brain. Just as a baby needs to be picked up and held in order for the neurological system to regulate itself, so a client needs the human relationship to process the changes that are occurring through neurofeedback.

They need the neurofeedback to quiet the nervous system and then they need somebody who will embrace the nervous system...you need a natural person who will hold this child and hug this child...when we’re talking about transference we’re really talking about the very youngest parts of people and the nature of unmet needs ...and people who have suffered....early childhood abuse and neglect and it’s not very hard to see the baby right there.

For Gaylen, integrating neurofeedback with counseling is best practice.

Gaylen utilizes a holistic approach with neurofeedback as the central feature for affect regulation. Using a mind/body holistic approach, Gaylen also includes discussions about
regulating the body with exercise, nutrition, fluid intake, sleep patterns, and any other aspect that will facilitate regulation.

Neurofeedback process. The neurofeedback process begins with a thorough assessment that usually lasts approximately two hours. After the initial assessment, Gaylen’s ideal time frame for an appointment is 1 ½ hours, split between getting feedback about the impact of the previous session, doing the neurofeedback training, and then counseling. The first major task is to find the brain’s frequency, the language that the brain speaks, the “ideal place where this brain can regulate itself.” According to Gaylen, finding the frequency is an “enormous gift” because as the brain begins to regulate itself, the client can start to “be okay in their own skin... not to be burning up with rage or shame or terror.”

For trauma survivors, Gaylen generally begins training on the right parietal lobe, the area most affected by trauma. Since flashbacks are located in the right temporal region, that area may also receive attention in the neurofeedback protocol. She later incorporates alpha-theta, if appropriate. Gaylen had “one of the most significant dreams” of her life after completing an alpha-theta session, and Gaylen finds that dream work is sometimes a key element of processing alpha-theta with her clients.

According to Gaylen, processing is a key element throughout neurofeedback training. First, the therapist must process with the client that changes from neurofeedback training happen slowly over time, or may happen rapidly. The outcomes are a bit unpredictable, and realistic expectations help clients to not be “set up for failure” or not to be surprised by rapid changes. Informed consent is complicated when changes are unpredictable. Informed consent includes asking the client, “You can go through a wide range of changes. Are you ready for that?”
Fear is a major topic to be processed and may include the fear of the technology, fear of individual change, and fear of the impact of change on relationships. Fear is a major treatment obstacle because “whole identities are built on affect so you suddenly start changing that affect and there are major shifts in identity.” In Gaylen’s experience, therapists must be “savvy” about the power of fear and must “hear it when their patient is talking about it.” Clients who have been accustomed to a state of high arousal can begin to lose a “sense of themselves” as that arousal starts to quiet and may “back away” from the process. Change can be “very scary” for clients who have built their identities on affect. Once that affect is diminished, they move more into the realm of asking themselves, “Who am I? If I am not this terrified raging shame based person, who am I?” Expectations, fear, identities, changing relationships: all must be processed for effective treatment.

In Gaylen’s opinion, no other therapy assesses as thoroughly as neurofeedback treatment does. The client is asked for specific feedback about changes that may have occurred in all domains, including cognitive, affective, behavioral, and relational, since the previous session. Gaylen uses that information each session to guide her neurofeedback protocol, changing the neurofeedback plan if necessary and adding other holistic elements if helpful. Clients are asked about negative effects as well as positive changes, as both are important in making protocol corrections. Outcomes that can be unpredictable and “scary” for both practitioner and client are “all part of the complexity of doing this kind of work.”

Although protocols are based on neuroscience knowledge of the brain, Gaylen has discovered that an effective therapist must engage in “two conversations” with both the brain and the mind, and then listen to what the brain is saying.

The individual intuitive moments…the moments of trying to figure out what this brain is
trying to tell you... there’s not a whole lot of science to that... it’s clinical intuition and it’s learning to listen to the brain... to be in conversation with the brain as well as in conversation with the mind or the person’s representation of their brain... and those can be two different conversations... and you have to attend to them equally and if there’s a difference between what the person tells you and what the brain seems to be telling you about their experience... and that’s not always easy to discern... but you go to what the brain is telling you.

To some degree, the therapist must be guided by intuition to know the questions to ask, to engage in both conversations, and then to guide neurofeedback training accordingly.

Gaylen provided specific examples of being guided by the brain as opposed to the mind. If a client says she has been feeling calmer since the last neurofeedback session, but then mentions that she is having nightmares in which she is killing people, then Gaylen knows that she needs to adjust the neurofeedback protocol to lower the client’s arousal level. Gaylen listens carefully to the brain for guidance.

Gaylen repeatedly emphasized the importance of experience in the therapeutic process. Since “every brain is different,” it takes experience to be guided by the protocols and yet be flexible enough to change according to client reports. An ideal therapist for trauma survivors is a person who is knowledgeable about trauma and who is “very experienced as a psychotherapist and very experienced in doing neurofeedback.” Gaylen acknowledges that these three areas of expertise are difficult to find in one person.

**Client factors.** When neurofeedback doesn’t work, why doesn’t it work? It’s a question that Gaylen feels should be asked more often. Physical factors that may interfere with the impact of neurofeedback on the brain may include inadequate fluid intake, viruses, allergic reactions to
substances such as food and mold, and physical changes in puberty. Anorexia and bulimia also “play havoc on the brain.” When neurofeedback has a limited impact, Gaylen thinks in terms of some of these physical factors instead of psychological resistance.

Gaylen has not noticed any multicultural factors that limit client response to neurofeedback. Her clients are generally between 30 to 65 years old, although she has trained babies as young as 3 months and adults as old as 97 with positive outcomes. Age is not a factor. She has trained males and females, and people from various racial and ethnic backgrounds with no noticeable difference in outcomes. She feels that neurofeedback has good cross cultural efficacy. However, socio-economic status is one multicultural factor that does limit treatment access and outcomes, as insurance companies will often not reimburse for neurofeedback training.

External factors. External factors include professional recognition of trauma, the culture of medication and profit incentives, and the neurofeedback field. According to Gaylen, the field trial for developmental trauma disorder has been opposed by various factions for at least two reasons. First, a developmental trauma diagnosis implies a “social movement,” in recognizing “rampant child abuse” that “causes enormous problems in every spectrum of our society.” The second reason for opposition may be the lack of financial incentive: “There is no profit center in this diagnosis…if you can diagnose children as bipolar you can put them on a lot of toxic medication.” A diagnosis of developmental trauma does not necessarily translate into sizeable profits from medication sales. Until professionals recognize the serious and pervasive impact of developmental trauma, the unique treatment contributions of neurofeedback may also go unrecognized.
According to Gaylen, the culture of medication affects the overall growth in acceptability of neurofeedback as an alternative to medication. Medication is prescribed based on brain chemistry, whereas neurofeedback is based on brain circuitry. Medical advances in neuroimaging techniques that show the electrical firing of brain patterns may initiate a paradigm shift from an emphasis on brain chemistry to an emphasis on brain circuitry. This potential paradigm shift may be slow, however, due to a profit incentive. “There is no profit to looking at the brain in terms of circuitry and there is an enormous profit in looking at it in terms of chemistry.” As just one example, Gaylen cited a recent article in the New York Times that stated that 500,000 children in the United States below the age of five are on antipsychotic medications, some as young as 18 months old. The entrenched system of physicians and pharmaceutical companies working together to encourage medication instead of brain circuitry changes has an impact on the neurofeedback field as a whole.

Public perception of neurofeedback also affects treatment outcomes. In some circles, neurofeedback is considered to be “fringy” and “experimental.” However, as well-known researchers such as Bessel van der Kolk embrace neurofeedback as a viable treatment option for children who have experienced trauma, both professional and public opinion may gradually change. The public may change from viewing neurofeedback as a “fringy” alternative to having confidence in it as an efficacious treatment modality. This shift could affect both the number of clients seeking neurofeedback as well as the expectation of help.

Gaylen also mentioned the current controversy within the neurofeedback field concerning high and low frequency training. Since she thinks that the low frequency training has not been adequately researched, she continues to use the high frequency treatment model in which she
was trained. However, she expressed the hope that more people may be helped as the neurofeedback field adds more treatment options to its repertoire.

**Summary**

Gaylen’s integration of neurofeedback into her counseling practice can be summed up in her statement, “I am in this privileged position where I watch the brain become mind.” The foundation of personality lies in the patterns of electrical firing in the brain, and those patterns can be retrained toward healthier functioning that affects every domain, including cognitive, affective, behavioral, and relational. In order to have an impact on these spheres, central affects of fear, shame, and anger must be quieted. Gaylen integrates her practice with both counseling and neurofeedback to address the centrality of fear in the lives of trauma survivors. The end result of the “brain becoming mind” is living more in the “human domain” of “enhanced relationships,” being attached to others in empathy and vulnerability. In this sense, neurofeedback, even with its computers, monitors, and electrodes, is actually a “relational technology” that allows people to drop their deep-rooted limbic affective defenses in order to love themselves and others. The prominent themes that emerged from the interviews with Gaylen are displayed in Table 4.5.
### Analysis of Participant #3: "Gaylen"

Table 4.5

Themes, Sub-Themes and Supporting Information

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<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
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Participant #4: “Julia”

Introduction

Julia holds a masters degree in counseling and a Ph.D. in psychology. She is both a licensed professional counselor and a licensed psychologist. She was trained in Eye Movement Desensitization and Reprocessing (EMDR), certified as an addictions counselor, and currently holds a BCIA-EEG certification, which is a biofeedback certification in neurofeedback. She has been a licensed therapist for over 20 years and began her neurofeedback practice 10 years ago.

Julia operates her private practice in an affluent suburb of a large metropolitan area. Located on the top floor of an office building, her space includes five treatment rooms containing almost every major type of neurofeedback equipment currently available: LENS, z score training, Roshii, and others. She also incorporates peripheral treatments into her neurofeedback practice, including biofeedback hand warming and heart rate variability. Her staff consists of several licensed mental health professionals, several technicians trained to operate the neurofeedback equipment, several office staff members, and several interns. Over the past 10 years, she has trained 20 to 25 interns. She and her staff provide services to over 100 clients per week.

Approximately 30% of Julia’s clients have some form of trauma as an underlying issue. Client presenting problems include depression (30%), anxiety (30%), autism spectrum (15%), attention deficit/hyperactivity disorder (40%), bipolar disorder (5%), chronic fatigue or fibromyalgia (10%), sleep problems (40%), headaches/migraines (40%), and traumatic brain injury (10%). Other problems include learning disabilities and sensory processing issues. Many of these presenting problems are comorbid.
Julia is a member of professional counseling, psychology, biofeedback, and neurofeedback organizations. She has been a board member for biofeedback and neurofeedback associations, and regularly attends their local and national conferences. She has completed research studies in her clinic on migraine headaches, presents at conferences, and plans to write a book in the future.

Entering Julia’s office is entering a whirlwind of activity. The waiting room is small but comfortable and a steady stream of people flows in and out. There are several people in the small administrative space that is separated from the waiting room by a counter. The office staff member has communicated with me by email and is prepared for me. Julia’s office manager hands me a folder of information that is well organized and attractive, filled with brochures about neurofeedback, several research studies, informed consent forms, and other information about the practice. The office is well organized and the staff is friendly.

In the waiting room a water cooler stands in the corner, along with supplies for making tea, coffee, and hot chocolate. On the central table is a large notebook filled with articles about successful neurofeedback stories, and Julia’s name and private practice are highlighted in yellow wherever they appear. The walls are decorated with enlarged, framed newspaper articles about Julia’s research studies indicating the efficacy of her neurofeedback techniques. The waiting room walls also display press releases describing personal success stories from her clients. Another wall contains an announcement requesting research participants for a study on neurofeedback and depression. The overall impression is that many people are seeking neurofeedback for a wide range of problems, and it is working. I feel confident in Julia’s abilities even before meeting her.
Individual Themes

This section provides a description of the themes that emerged from the interviews with Julia during the process of open coding.

Practitioner. When I meet Julia, she is smiling, engaging, and energetic as she greets me. I feel immediately at ease. I would never guess that Julia came to neurofeedback due to a desperate health crisis 11 years ago when she contracted chronic fatigue syndrome while living overseas. Julia described the extent of her illness: chronic fatigue “wiped out” her health to the point that she could barely get out of bed for 18 months. She spent “tens of thousands of dollars” in treatments that did not work. She came to neurofeedback as a last resort, after two psychologist friends told her that she should try it when she returned to the United States. She followed their advice. Upon returning to the United States, Julia described getting “zapped” with the LENS, one form of neurofeedback treatment. During the first treatment, “It completely woke me up. I felt like something deep in my head just kind of lifted... I completely got my energy back from here up” [pointed to neck up to head]. A biofeedback technique had cured her of migraine headaches 15 years before this time, and now a neurofeedback technique had cured her of chronic fatigue.

It was my second healing with biofeedback so I felt like God was telling me to get my act together and start doing this which is what I had envisioned. [Interview 1, #87-88]

This second cure was wake-up call that set her on a new career path, one that she had envisioned while walking in a nearby park near her overseas home. In that park she envisioned that, if she could ever somehow recover from chronic fatigue, she would create a “healing center” to help others, “and that is exactly what has come to pass.”
One would never guess that Julia suffered from chronic fatigue syndrome in the past. She “hits the ground running” six days a week in her practice, supervising protocols for over 100 clients per week in an energetic manner that was evident to me during our interview. We started our interview in the morning, catching time between clients. As lunchtime approached, Julia suggested that we go to a nearby Thai restaurant. She grabbed my two little recorders, and I followed her out the back door of her office as she introduced me to staff along the way, through the hallway, down the elevator, through the lobby, out the front door, through the parking lot, into her car, and to the restaurant. Throughout she held the recorders and talked into them while I asked my interview questions. Dishes clank in the recording background as we continued the interview through ordering lunch, eating our main course, and sharing a Thai dessert. Several times I turned off the recorders as she indicated that she wanted to share personal information about herself and other neurofeedback providers. The recorded interview continued as we walked out of the restaurant, got in the car, drove back the office, went up the elevator, and finished the final segment back in her office where we originally started. For this final segment, she invited one of her interns to join us.

Julia never lost her focus. Four times during our interview we were interrupted by a staff member asking a question about what to do next with a client. Julia looked at the client file quickly, instructed the staff member, and then picked up on answering my questions as if no interruption had occurred. She was generous with her time, her information about others in the field, and in her interest in me. At one point during lunch, she asked about my goals and future plans.

Julia says, “I practice what I preach” in terms of self-care. She trains herself with neurofeedback and includes a wide array of other activities for relaxation. She is also a lifelong
learner. She stated that she entered an “enormous learning curve” when she began her neurofeedback practice, and she continues to attend local and national conferences, online webinar trainings, and other educational venues. She expressed that she believes strongly in the importance of continuing education and has logged over 1,000 hours of post doctoral training.

Julia's vision in the park of creating a “healing center” infuses both her personal and her professional life. She is on a mission to improve herself, to create a high quality practice, and to further the neurofeedback field as a whole. She speaks enthusiastically about the upcoming International Society for Neurofeedback and Research (ISNR) conference in Colorado and lists all the reasons why I should join the organization and why I should attend the conference. She describes the steps she takes to ensure quality care in her practice. She invests in others by mentoring and teaching, and she invests in the field through professional service on the boards of local and national neurofeedback organizations. She follows the research of others and has published her own research from her practice.

Julia is eclectic in her neurofeedback approach, saying that she owns “literally every machine” available on the market. She believes in “cross pollination” of ideas because “it’s a big world out there” and no one system can meet every need. She believes that her treatment success rate has increased because she has “a whole array in my armament to help people.” She uses military words to describe her battle against human disorders. Maintaining a high quality practice with many types of equipment requires a serious commitment to ongoing training. In order to gain expertise in a fast moving field, Julia emphasizes the necessity of continuing education, consultation, and ongoing mentoring.

**Trauma understanding.** When Julia talks of trauma, she sometimes mentions PTSD, but more often she refers to the complex trauma that occurs when a person is under a long term
stressor. She talks about clients who as children were "marinated in fear." She has become sensitive to recognizing complex trauma in a client's background by the myriad of somatic complaints that present themselves, symptoms that Julia describes as a "body clench," like the client is "holding onto something." These symptoms often include pain in general and chronic upsets such as irritable bowel syndrome and migraine headaches. An emotional dimension that often appears in this population is being "paralyzed in life." Julia emphasizes the necessity of being careful with this population. If the neurofeedback training "softens the body" and relaxes them too quickly, they can feel vulnerable and afraid. Julia describes several "disasters" in which a neurofeedback provider was not aware of previous trauma and the client had a serious abreaction. Julia insists that a licensed mental health professional be in the office at all times, one who understands trauma and how to cope when unexpected reactions occur. If clients have trauma in their background, Julia also insists that they have an ongoing relationship with a mental health professional in order to process the changes that neurofeedback may bring. This relationship is particularly important if the person is what Julia terms a "therapy virgin," one who has not yet processed traumatic events from the past.

**Therapeutic process.** The visible physical environment and the underlying business environment both support Julia's neurofeedback practice. Her office waiting room, with enlarged and framed neurofeedback success stories on the walls and the neurofeedback newspaper clippings in the notebook on the central table, all create a sense of hopeful expectancy. While sitting in the waiting room, I found myself wanting to be assessed and trained. Who couldn't improve their brain functioning? Julia's business practices also support her practice. She is a good marketer, good at getting press and advertising her services. For new
clients she has an attractive welcome packet filled with research articles and more success stories. In addition, she has a variety of staff that supports the process, including a nutritionist.

Julia emphasized the importance of instilling hope in clients by telling stories of others who were helped by neurofeedback. Through this process, clients know that they are “not alone.” In Julia’s experience, building rapport with clients, getting to know them, increases neurofeedback outcomes. The more a practitioner knows the client, the more intuitive sense the practitioner can have about what the brain is doing and what protocol to try next. According to Julia, neurofeedback is art as well as science.

Julia begins the neurofeedback process with a thorough assessment and screening, including a quantitative EEG (QEEG), also known as a brain map. The brain map can give a clearer picture of brain functioning and sometimes reveal things that the client may not be willing to tell. While I was in Julia’s office, she met with parents of a teenager who had a QEEG not long ago. After Julia recognized a particular pattern in the QEEG, she asked the teen, “Are you having auditory hallucinations?” to which he responded, “Yes, how did you know?” Julia said that she would talk with the teen’s psychiatrist about an adjustment in medication.

Based on the initial assessment, Julia described the manner in which she screens people in or out of the neurofeedback process. She knows who she will and will not accept as a client. She will not treat seizure disorders. She will not treat people with any type of addiction, whether it is drugs, alcohol, or computer games. She explained to me that the brain does not know the difference between a substance addiction and a process addiction, and she has had children or teens addicted to computer games whose brain maps appeared as if they were addicted to a drug. She will not treat this population until they treat the addiction first. She tells them clearly, “Don’t waste your money with me!” She also gives a clear informed consent that makes clear to
the client the time commitment and expense involved. The informed consent can result in a self-screening process, so that clients who choose to initiate neurofeedback training are sure of their initial commitment and motivated to see the process through to the end.

Once a client enters the neurofeedback training process, Julia has a wide array of equipment to meet almost every need. She says that she likes to “cast a wide net” so that if one protocol doesn’t help, she can switch to another. Her general rule is “stabilize first.” In addition to neurofeedback, she may also offer some peripheral work such as thermal hand warming, a technique that cured her of migraine headaches 15 years ago. She combines the newest technological equipment with tried and true techniques that helped her. She uses awake state training as well as deep state alpha-theta. In addition, she utilizes a holistic approach that includes education on nutrition and testing for food sensitivities and allergies. Julia emphasized the importance of having a wide support system, including many neurologists to whom she can refer clients. She does not operate alone.

**Client Factors.** Julia discussed several client factors that complicate neurofeedback training. Clients with addictions must get treated for the addiction first and then return to her for neurofeedback training. In her experience, neurofeedback tends to work well for those with high arousal symptoms such as anxiety but not as well for those with low arousal symptoms, including depression, “sleep-headedness,” or AD/HD. Neurofeedback may be effective in alleviating those symptoms, but it takes longer. Sometimes physical issues such as infections, allergies, nutrition, and medications can interfere with the process. Julia has observed that environment also affects results. If a person, particularly a child, makes improvements through neurofeedback but then returns to a “toxic family environment,” longterm results may be limited.
In Julia’s experience, multicultural factors do not seem to have an impact on neurofeedback outcomes. Julia’s practice is located in a large metropolitan area that is international in nature, and she estimates that 25% of her clients are from racially and ethnically diverse backgrounds. Drawing from the Myers-Briggs Type Indicator (MBTI) personality test, the one type of person who tends to have trouble engaging in neurofeedback is the ISTJ male (Introvert/Sensing/Thinking/Judging). According to Julia’s observation, this type is usually an engineer or military person who overthinks the process and cannot merely trust his brain to engage with the program.

**Neurofeedback field.** Just as Julia enforces a high standard of quality in her private practice, so she wants to raise a high standard of quality in the neurofeedback field as a whole. She discussed several stories of therapeutic “disasters,” including one practitioner whose business was shut down by the state authorities. She is concerned that “there are a lot of quacks out there.” Julia is working with a national organization to devise credentialing standards to promote quality in the field.

Julia stated that she is aware of the controversy concerning high and low frequency training, and that she would like to see more research on the efficacy of the low frequency training. She wants to get more press for the effectiveness of neurofeedback, including research outcomes. As neurofeedback becomes more widely accepted, insurance companies may be pressured to cover the cost, a move that would in turn allow a larger group of people to benefit from its effectiveness.

**Summary**

More than 11 years ago, when Julia was so sick with chronic fatigue syndrome that she could barely walk, she envisioned creating a “healing center” that would help others.
Neurofeedback provided the cure that Julia needed, and she went on to create the healing center. Her personal as well as her professional life is infused with a holistic approach to wellness, an approach in which neurofeedback is the centerpiece. In a field that changes rapidly, she emphasizes the necessity of continuing education, consultation, and ongoing mentoring. Just as she upholds a high standard of quality in her private practice, she wants see a more uniform standard of quality enforced in the neurofeedback field as a whole through a credentialing process. The prominent themes that emerged from the interviews with Julia are displayed in Table 4.6.
Analysis of Participant #4: "Julia"

Table 4.6
Themes, Sub-Themes and Supporting Information

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<th>THEME</th>
<th>SUB-THEME</th>
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Participant #5: “Marian”

Introduction

Marian completed a masters degree in social work and Ph.D. in health psychology. She is a licensed clinical social worker (LCSW). She completed her initial biofeedback training at the Menninger Clinic and currently holds certifications from the Biofeedback Certification International Alliance (BCIA) in both biofeedback (1995) and neurofeedback (1997). She has been a mental health professional for 25 years and a neurofeedback practitioner for 20 years.

Marian’s private practice is located in a large metropolitan area where she specializes in using the Flexyx Neurotherapy System (FNS) to treat traumatic brain injury (TBI), posttraumatic stress disorder (PTSD), fibromyalgia, and chronic and life-threatening medical problems. She has published research articles on the use of the FNS system on TBI, PTSD, and fibromyalgia, and contributed to a book on neurofeedback. In the fall of 2010 she began recruiting Iraq and Afghanistan war veterans for a study on TBI and PTSD to be based in her clinic, in cooperation with the Traumatic Injury Research Program of the Department of Defense. She has also served as a consultant on research studies with the National Institutes of Health. Since 1994, she has seen approximately 1,900 clients in her private practice.

Marian has completed approximately 50 presentations and workshops and has made several media appearances, including a Public Broadcasting Service series on the impact of stress and trauma on the brain. She has facilitated groups for cancer patients and has designed programs for mind-body regulation for groups. She currently supervises neurofeedback and biofeedback therapists.

Some form of trauma is an underlying issue in 95% of Marian’s clients. Other issues include depression (75%), anxiety (60%), autism spectrum (15%), attention deficit/hyperactivity
disorder (30%), bipolar disorder (5%), chronic fatigue/fibromyalgia (5%), sleep problems (80%), headaches/migraines (70%), traumatic brain injury (80%), and irritability and violence.

Marian regularly attends both local and national biofeedback and neurofeedback conferences, as well as social work conferences. In addition, she has served on the board of a regional biofeedback organization.

I arrived at Marian’s office in the morning and stayed most of the day, as our interview was broken into three parts. We conducted the first part of the interview before a client appointment, the second part over lunch at a nearby restaurant, and the third part back in her office after lunch and after another client appointment. We were interrupted several times when Marian answered the cell phone that she had placed in her pocket. She had recently sent an announcement to 100,000 people about a new research study based in her clinic for United States Iraqi and Afghanistan war veterans who had been diagnosed with a traumatic brain injury or posttraumatic stress disorder. Veterans were calling to inquire about participating.

Marian’s office was quiet and spacious. Her desk stood in one section of the room and her neurofeedback equipment in another section. She had prepared a folder for me that included research articles, her curriculum vitae, completed copies of all the paperwork that I had sent her, and an assortment of other information. Marian reclined in a chair with her feet up while we talked. I placed one recorder on each arm of the chair, since she told me that her voice does not carry well. She talked quietly but passionately about her experiences, telling me story after story in great detail, stories that have spanned over 20 years of neurofeedback practice.

Individual Themes

This section will highlight some themes that emerged from the individual interviews during the process of open coding.
Practitioner. Forty years ago Marian was diagnosed with cancer, and it was then that she became interested in the mind-body connection emphasized by both biofeedback and neurofeedback. Open to new ideas and paradigms, Marian described how these therapies "made perfect sense" to her. In addition, she completed trainings in guided imagery and hypnosis. Feeling confined by her work situation and "tired, disappointed, unsatisfied going to trainings" where the speakers were not educated in physiology, she decided to return to school at 53 years of age to obtain a doctorate in health psychology. She has been a lifelong learner.

While studying for her doctorate Marian read "dramatic" and "compelling" stories of change brought about by biofeedback in a book written by Patricia Norris. She subsequently completed a one-week training at the Menninger Clinic, the "catalyst for biofeedback" in the United States because "they nailed it down." At that point, Marian says that life and career were transformed. She brought back the equipment, used it on herself, and it made a "huge difference" in her memory and ability to sustain attention. Before neurofeedback, she "had a horrible time" with academic endeavors because she couldn't remember things and "had to live with lists." After neurofeedback, "it all changed...it changed my life...I couldn't be doing this [the research] if I didn't have that treatment." Marian traced her memory problems back to a "pretty nasty head injury" that she had sustained as a 5 year-old child, "so I learned about head trauma through myself and what it could mean."

Marian's holistic approach to treatment can be summed up in her statement, "The magic is not in the box." The magic is not in a technique alone, but in a holistic approach that encompasses mind, body, and relationship. Marian's early training at the Menninger Clinic formed the basis of her holistic philosophy, as it included not only information about biofeedback and neurofeedback techniques for the body, but also emotional and relational
components. Social components, family systems, genograms, and physiology were all in the curriculum.

However, Marian emphasized that the Menninger training involved another component just as impactful although far less obvious. That component was the overall Menninger underlying philosophy from Quaker tradition that “the more you give, the better.” For people who had completed the Menninger training, that giving included mentoring over the phone from a top Menninger person within an hour of a call for help, copies of video tapes, copies of articles, and anything else helpful for professional development. It made an impact on Marian. When asked the most important lesson she had learned through her years of practice, she replied, “You need to be reliable…they need to know that you will be there for them.” Underlying all other professional characteristics is a stable, caring presence for clients.

I experienced this caring even during the interview. Marian asked where my car was parked out of concern that I would not receive a ticket and offered me more quarters for the meter. After finishing our lunch in a nearby restaurant, and after having talked extensively about head injuries, I turned off my recorders. It was then that I asked her advice about a member of my family who had recently sustained a concussion in a car accident. Marian turned sideways in the restaurant booth, demonstrated a movement technique that would help to coordinate the two sides of the brain, and then asked that I imitate her movement so that I would remember it. We both sat sideways in the booth, practicing the technique. I appreciated her care.

Although excited about the possibilities that neurofeedback held, Marian described how she had to overcome significant technological and financial barriers in order to begin using neurofeedback in her practice.
I started going to the biofeedback meetings, all the vendors were there with these incredible, the beginnings of the new computerized devices, which was absolutely terrifying to me. They were expensive… I would go in and look at them, and get scared to death [emphasis] and flee [emphasis]. [¹, 395-399]

Marian found the success potential so “compelling” that she overcame being “scared to death,” purchased the equipment, found a mentor, practiced on herself before using it with clients, and has continued to learn throughout the years. During our interview she frequently mentioned various researchers, research study outcomes, and recent journal articles that she had read. She regularly attends local and national conferences.

Marian is committed to research. After attempting to describe the voluminous data generated in one small research study, she motioned for me to follow her. My recorders in hand, I followed her down her office hallway and watched as she pulled out a file cabinet drawer containing file after file of data collected in her most recent study. She commented, “It’s more than I ever dreamed it would be.” Marian is also aware of the practical aspects of operating a private practice. She told me of one major practice that “went under” due to bad business decisions. Since she has no funding for her current study, she estimates that she can accept only six participants.

In addition to researching neurofeedback, she also researches her own practice. Several years ago she created a spreadsheet of all the clients who have walked through her doors since she opened 20 years ago and found that 75% have come through personal referrals.

Marian emphasized the importance of experience. She has had a wide range of experiences over many years and in different settings. She has many referral sources to which she can send clients, and she mentions crania psycho-treatment, neurologists, and psychiatrists.
In emphasizing experience, she once again mentions the importance of stability for clients. She has learned through the years that “You have to be pretty unflappable...I’ve been told a lot of things that I think would drive a lot of people around the bend.”

**Trauma understanding.** Marian uses a wide definition of trauma that includes PTSD, many forms of head injuries, and some aspects of complex trauma. In her experience, trauma is a common occurrence. It’s “unusual to find somebody who hasn’t had some kind of trauma.” Marian says that trauma takes many different forms, and she assesses thoroughly for it. On her intake form she asks the question, “What is the worst thing that has ever happened to you?” She notes that many clients say that the worst thing that has ever happened to them is the loss of a relationship. In her research studies on fibromyalgia, Marian has also noted the connection between fibromyalgia and sexual abuse, an example of the mind-body connection.

Marian’s main interest in trauma, however, is PTSD and head injuries that can take many forms. Marian’s definition of a head trauma encompasses a wider scope than a concussion or a more serious accident. She places her hands together in a squeezing motion and her voice becomes strained as she describes the process of squeezing a baby’s head together to force it through a narrow slit in the mother’s abdomen during a cesarean birth. She describes these types of brain traumas “that aren’t usually thought of as traumas, but it’s a trauma to the brain.” According to Marian, trauma is a “very big category.”

**Neuroscience knowledge.** The foundation of Marian’s trauma understanding is her neuroscience knowledge. She emphasized the manner in which fear affects brain functioning.

I think of it as getting frozen into a protective state. To me the brain’s first job is to keep you alive...and I know a little bit about what it’s like to have extreme fear and be stuck in a state...you may not know you’re stuck there, but you’re stuck. [#1, 886-888]
Although the brain can become “stuck” or “frozen,” the number one factor for positive treatment outcomes is neuroplasticity or “the brain’s ability to change.” Marian says, “It’s our biggest ally” [#1, 916]. While working with hospice, Marian observed that every cell has a desire to “fix itself.” A therapist just needs to find the “right key.”

Since neurofeedback training is often follow by quick changes in personality, Marian theorizes that neurofeedback must be somehow changing the neurochemistry of that “hyper protective state” that existed to protect the person. In Marian’s opinion, neurofeedback utilizes brain plasticity to make changes in emotional and cognitive states.

**Therapeutic process.** Marian mentioned that the therapeutic alliance is important in neurofeedback training although “it is certainly far less than anybody who is in talking psychotherapy.” Although Marian downplayed the importance of the therapeutic alliance in neurofeedback training, the fact that she remembers the details of so many client stories throughout the past 20 years indicates that she listens carefully, that she cares, and that she forms a strong bond. She is able to change protocols according to what clients tell her, in that sense allowing the client to guide the process: “Good therapists have always been very attuned to what people bring, and so they wouldn’t necessarily be wedded to one approach” [#1, 876].

Marian’s sensitivity and empathy showed in the stories that she told. She described how it bothers her when doctors dismiss fibromyalgia symptoms as being purely psychological:

They’re sick you know something’s wrong...but there are so many stories we have heard where physicians say you got to see a psychiatrist because it’s all in your head...I don’t think anyone should be allowed to treat [emphasis] people if they treat them that [emphasis] way. [#1, 1124-1139]
Several years ago, one of Marian’s Marine Corps clients mentioned that he was going to see the movie *Hurt Locker*. In order to more fully understand her military clients’ combat experiences, Marian decided that she would also see the movie. She felt like she “was going to pass out in the first ten minutes or so,” but decided to watch the entire movie when she remembered what her clients had suffered: “I was thinking these guys live [emphasis] this so surely I can watch a movie.” Marian is willing to identify with her clients’ experiences.

Marian told a success story about a high-functioning client who came to her with presenting symptoms of depression and anxiety. After a number of neurofeedback sessions, the client told her merely as an aside, that he had cleaned out 52 boxes of books from his house. Marian exclaimed, “Fifty-two boxes of books! That’s a library!” Marian realized that he had a hoarding problem that he had never mentioned before. She described the amazing change in thought patterns as the man told her “I could just look at something and used to think well somebody could use this, it’s still good, I shouldn’t throw it away, and now it’s sort of like well, there is no point in keeping it” [#1, 963-965].

Marian also remembered in great detail an adolescent client who had completely lost bladder control due to spinal damage sustained in an accident. Although she had seen the client years ago, she remembered the details of the accident and the fact that the teenager showed signs of improvement after only two or three neurofeedback sessions. However, he stopped the neurofeedback training after his neurosurgeon told him that’s “ridiculous, it won’t do anything.” Marian tapped her fingers on the table with great emphasis as she said, “It still bothers me.”

When I asked Marian what her greatest lesson was in her years of practice, she responded, “You need to be reliable...you need to be on time...they need to know that you will be there for them.” If clients have a neurofeedback training on a Friday, Marian gives them her
cell phone number so that they can reach her on the weekend if there are any negative effects. She informs the clients of symptoms that will likely occur, such as headaches, and that these symptoms will go away “but if you need to hear me say that you call and I will say that.” Marian is a stable presence for her clients throughout the neurofeedback process.

**Neurofeedback process.** Marian begins the neurofeedback process by completing a thorough assessment that includes a mini map of the brain and questions about any kind of head injury, great or small. Marian describes head injuries as a “shadow kind of illness” that is often undetected, although connected to many other disorders. Marian uses the metaphor “detective agency” to describe the assessment process in which she looks “outside the box” for the root causes of symptoms. She doesn’t accept diagnoses or labels, since they may be inaccurate. For instance, she explained that people with parasitic Lyme disease are often diagnosed with psychosis and prescribed medications that do not eliminate the root cause. To illustrate this point, she told me of one teenage client who, with no history of violence, suddenly attacked a passerby with a baseball bat. After being diagnosed with psychosis, Marian sent him to a psychiatrist familiar with Lyme disease. When treated for Lyme disease, all psychotic symptoms disappeared. Marian is careful to screen for Lyme disease, parasitic infections, and other chronic infections, since neurofeedback will not be effective in the presence of chronic infections. Clients must get the infections cleared up before starting neurofeedback, and she has a full range of referrals for these clients.

Marian begins neurofeedback training in the typical manner, by starting with the most obvious symptoms or behavior, not with the diagnosis. Symptoms are primary because “Symptoms are the brain’s way of talking to you, the outsider” [#1, 866-877]. Marian explains that decreasing pain also takes a primary role, since pain “co-ops” brain function in an urgent cry
to “fix the problem.” Two other colleagues share office space with Marian, and together they have a wide range of tools that allow flexibility in treatment protocols. “Neurofeedback is not always the right thing,” as sometimes “going through the autonomic system will create a change” [#1, 856]. Marian describes how she has gotten rid of lifelong panic attacks in less than five sessions by teaching clients to breathe properly, so that they can “abort” the attacks. Marian emphasizes that the therapist must find the right tools that will talk “to” the brain and not “at” the brain. Therapist skill and client feedback helps the process. “We collect data at every single session, hard [emphasis] data” [#1, 759] through a symptom tracking sheet that Marian uses from intake through therapy completion. Practitioner tools that address both the central nervous system and the autonomic nervous system, skill in applying the tools, and consistent client feedback increase the likelihood of treatment effectiveness.

Marian says that “soldiers love” the fact that they may not have to talk about their combat experiences in order for the treatment to be effective. However, Marian finds that sometimes they begin talking after a few sessions, because the brain has calmed down enough that “talking doesn’t bother them anymore.” Marian has observed that sometimes neurofeedback is effective when talk therapy is not. The man who had been hoarding had been going to talk therapy for years with no change, but neurofeedback produced changes in thought patterns in a relatively short time period. Marian says, “So why does this do something? I don’t know…something moved” [#1, 974]. In other instances, neurofeedback “needs to be combined with therapy because there can be a lot of life changes” that impact relationships. Quick changes that impact close relationships are best processed in talk therapy.

Neurofeedback training involves risks as well as benefits. Marian highlighted a recent journal article about negative effects and abreacts, saying “people say there aren’t but there
can be” [#1, 617-618]. Marian asks in the consent form, “Are you willing to have a headache, or feel really tired, or re-experience the pain at the time of the trauma with the first treatment or two?” In particular, clients who have had a concussion are likely to have a headache “because there is a recall of the somatic experience” (#1, 922-926). According to Marian, the fact that negative side effects occur is evidence that the effectiveness of neurofeedback is not merely due to a placebo effect, as some critics purport.

**Client factors.** According to Marian, the number one client factor that contributes to successful neurofeedback treatment is the “brain’s ability to change” and its desire to grow toward health. The responsibility lies with the therapist to find the right key to talk “to” the brain and not “at” the brain, just as one needs the correct key to start a car: “If you go to your car and you have the wrong key, do you blame the car? No... you don’t have the right tool” [#1, 838-839]. It seems that for Marian, the primary responsibility for successful treatment lies not with the client, but with the therapist.

When asked to describe the typical client, Marian at first laughed, saying “There is no such thing,” but then quickly thought of a common denominator. Most clients are “miserable,” and they come to neurofeedback as a “place of last resort.” Marian observed that there are no salient multicultural factors that influence treatment. Fewer men than women come to neurofeedback treatment, although both respond well.

**External factors.** We were eating our lunch in a restaurant when I asked Marian about obstacles to successful treatment. She looked around, leaned over the table toward me, and whispered, “Doctors.” She saw the medical profession as both a help and a hindrance to neurofeedback success. She emphasized the importance of having a wide range of medical referral sources for clients, and yet she still remembers with great disappointment how a
neurosurgeon discouraged her teenage client who was regaining neurological control. She wondered, "I don’t know why it’s so hard for some physicians to just say well I don’t know or at least ask some questions" [#1, 1115]. In addition, she said that doctors sometimes have an attitude of “just give them the pills,” relying too much on medication in treating the pain and not the root cause of the pain. She observed that medical labeling and misdiagnosis also prevents professionals from looking “outside the box,” thereby missing the real cause of the problem. On the other hand, Marian noted that some physicians are becoming more “open-minded and saying ‘Why not?’” [#2,155].

Marian attributed the openness of some doctors to neurofeedback to the “40-year rule,” meaning that it generally takes 40 years for a treatment to be accepted by the medical profession, “Of course,” Marian said laughing, “with the exception of medication.” In addition, as public awareness of neurofeedback grows, more people are likely to seek it out as an alternative to medication. Marian observed that public awareness of neurofeedback is growing at the same time as public concern about medication side effects, “especially where children are concerned.” Marian thinks that acceptance of neurofeedback is starting to reach a “critical mass,” and that the profession will grow in the future.

Summary

Marian’s personal neurofeedback experience that healed a childhood head injury changed the course of her career. She says, “There is nothing out there that does this. So that has set the course of my life.” Her early training at the Menninger Clinic formed the holistic foundation of her practice. She uses a wide definition of trauma that includes head injuries not generally thought of as trauma, “but they are trauma to the brain.” Although trauma may cause the brain to get “stuck” in protective patterns, the practitioner’s biggest ally for change is neuroplasticity, the
brain’s ability to change, and the desire of every cell to grow toward health. Public opinion of
neurofeedback as a viable treatment option is reaching a “critical mass,” and if the “40 year rule”
proves true, neurofeedback is also nearing the point of wider acceptance by the medical
profession. The themes that emerged in the interviews with Marian are displayed in Table 4.7.
**Analysis of Participant #5: “Marian”**

**Table 4.7**

Themes, Sub-Themes, and Supporting Information

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Participant #6: “Helen”

Introduction

Helen completed a bachelors degree in physics and attained doctoral candidate status in the field of neurobiology and behavior. She has been certified by the Biofeedback Certification International Alliance (BCIA) in biofeedback (BCIA-B) since 1991 and in neurofeedback (BCIA-EEG) since 1994. She became involved in the neurofeedback field after experiencing dramatic changes in both herself and in family members through neurofeedback training. She has been a neurofeedback practitioner for 21 years.

Helen’s private practice is located in a large metropolitan area in the Pacific Coast region of the United States. She operates the clinical practice, while her husband is involved in research and business aspects of the practice. Together they organize neurofeedback clinical training seminars both in the United States as well as in international locations.

Approximately 50% of Helen’s clients have trauma as a central issue. Other issues include depression (30%), anxiety (30%), autism spectrum (5%), attention deficit/hyperactivity disorder (30%), bipolar disorder (5%), chronic fatigue/fibromyalgia (5%), sleep problems (30%), headaches/migraines (30%), and traumatic brain injury (10%). Helen sees approximately 20 different clients twice per week for neurofeedback training. She works with another clinician in the practice.

I met Helen for our first interview at a hotel on the East Coast. She and her husband had flown from the Pacific Coast the night before in order to conduct an advanced training seminar for neurofeedback providers who have been in practice for at least a year or more. Helen had agreed to be interviewed during a break in her teaching schedule while another team member presented. We found a quiet spot in the hotel lobby and I turned on my recorders. As I listened, I realized that I was hearing much more than Helen’s neurofeedback involvement. I felt as if I
were turning the pages of a living neurofeedback history book, filled with all the unexpected twists and turns that pioneers travelling in uncharted territory always encounter.

**Individual Themes**

The following is a narrative description of the themes that emerged in the interviews with Helen.

**Practitioner.** Helen describes herself as being “open to trying new things” if they “make sense” to her. Neurofeedback made sense to her even in the early 1980s, when Barry Sterman was publishing the results of groundbreaking research in training the brain waves of cats and when computers were “brand new.” For Helen, two things converged that she says “just hit me right.” First, neurofeedback dovetailed with her background in neuroscience, and secondly, it had the potential of helping her family. Her son had a seizure disorder accompanied by psychiatric problems. After reaching candidate status in a doctoral program in neurobiology and behavior, Helen had dropped out due to her health problems of hypoglycemia and chronic fatigue syndrome. When a friend told her about a neurofeedback practitioner 30 minutes from her home, Helen didn’t even inquire about cost. She describes having “the overall feeling that that…click [emphasis] we need to try this.” She did try it, with results that she describes as “profound” and “compelling.”

Helen realized that if neurofeedback could make such a “profound” difference in her own family, then it could help many other people also. From that time forward, neurofeedback became not just a personal solution, but a life mission to “make this happen in the world.” Not just in her family or in her region, but in the world. She thought, “Ok, this is profound this is important…why didn’t I know about this? Why doesn’t the world know about this?” [#1, 82-87]. She thought of all the people that neurofeedback could help.
We still had that vision because just like everybody who gets into this field now it’s like oh my God if you thought of all the people you could be helping? Let’s get busy, let’s make this happen in the world. (Helen, Interview #1, lines 260-262)

Helen speaks with enthusiasm as she describes how she and her husband brought the neurofeedback equipment home and “just started hooking people up” with “surprising” results. “Neurofeedback has always been surprising…it’s always been more than we expected” [#1, 300-306]. Neurofeedback had become a family endeavor and remains so today.

In describing the work of pioneering a new and rapidly changing field, the theme of tension that sometimes erupts into open conflict between two perspectives occurred repeatedly during our conversation. There was conflict in the early days between the new technology and old technology, and this conflict continues to the present day between high and low frequency neurofeedback training. There is tension between a research perspective that looks for group similarities, and a clinical perspective in which “you don’t care about the group...you don’t care about the diagnosis or whatever...you just care about this person right now” [#2, 96]. There is a tension between staying with what works right now and pushing for new protocols and instrumentation that might work even better. There is tension between being “territorial” and being open to training others. At several points in Helen’s neurofeedback history, the conflict became so great that there was a break in organizational affiliation. Despite numerous setbacks, she could not “walk away” from neurofeedback.

Knowing the tiny [emphasis] bit about neurofeedback that we knew at that time I mean just our very limited experience at that time we just couldn’t [emphasis] walk away from it... we said you know this is going to happen in the world and it would... kill [emphasis] us if we weren’t the ones to do this because it’s just it’s just so compelling
Helen and her husband have devised a developmental strategy for getting neurofeedback “into the world.” So that she can continually develop techniques that she can then teach in professional trainings, Helen is the head neurofeedback clinician in the organizational clinical practice. Her husband oversees instrumentation development and research. Their organization has conducted a research study on the effectiveness of neurofeedback on residents of a drug treatment center located in their metropolitan area.

It takes not only passion, but also business savvy to get neurofeedback “into the world.” Helen describes their attractive website that draws local people for regular appointments as well as people from far distances to come for intensive times of neurofeedback training. She offers a free consult appointment initially for those interested in knowing what the process is all about. The organization has moved into a new, more spacious space that will more comfortably accommodate both clients and professional trainings.

**Trauma understanding.** Helen has treated clients with both posttraumatic stress disorder and complex trauma. She described the manner in which trauma affects the “core sense of self,” so that a person may become easily overwhelmed and threatened because there is “no place of safety in himself.” Self-destructive behaviors include addictions as a person attempts to self-soothe the hyper reactive neurological state. Helen has successfully used neurofeedback with people with a wide range of traumatic experience.

**Neuroscience knowledge.** When Helen knows that any type of trauma is an underlying factor in a client’s symptoms, she knows that she has to train on the right side of the brain for physical calming. Helen described the impact of early childhood trauma.
You couldn’t do that early dance to learn to be settled in your own body and to learn to understand your world... and so they’re disregulated for the rest of their lives in being uncomfortable in their own bodies and being uncomfortable in the world and reactive and hypervigilant...So when I see people with trauma and developmental problems coming...I know I need to train right side. [#1, 580-584]

The right brain manages our “sense of ourselves,” the way in which we feel settled and comfortable with ourselves, and allows us to “orient to new situations.” The left brain has “its own internal agenda” of schedules and goals. Left brain training may need to be done later, but when trauma is in the clinical picture, right brain training is the priority. Alpha-theta training is also added after the right brain is calm enough to handle the traumatic memories that may emerge from the deeper areas of the brain.

**Therapeutic process.** Helen places great emphasis on building a relationship with clients that is more like a “coach” nudging a person toward better functioning than like the medical model of a doctor diagnosing “what’s wrong with you,” or “how do I cure you?” Helen uses a client-centered approach that is respectful of the brain’s ability to change.

We’ve moved completely away from the sort of model of what’s wrong with the brain and fixing it to the place of helping the brain reorganize its own behavior....respectful of the brain’s ability to fix itself. [#2, 48-51]

Helen describes the therapeutic process as a “team effort” in which she and the client “work together” in a constant interplay of feedback before, during, and after the neurofeedback training session. She tells clients, “I know about neurofeedback, but do you know about you? So you’re going to have to talk to me about what’s going on.” Not getting feedback from clients is a “nightmare.”
Helen knows how to get both verbal and nonverbally information through careful observation and by asking pertinent questions. Helen flexibly changes training protocols based on client feedback, an ability she calls “art based on science.” Helen explained that science is about the group, but clinical practice is all about applying an overarching model to fit all the complex variables of the individual sitting before her at this moment. It takes art and intuition to listen and observe carefully and then “apply the model in a sensitive way for an individual.”

Helen considers the low frequency training equipment that she currently uses to be a much “stronger tool” than she had before, a tool that produces changes more “quickly” and more “completely” than in the past. She admits that neurofeedback may not cure every disorder, but it can certainly help improve brain function in some way. Helen compares neurofeedback training for the brain to working out at the gym for the body. It may not make a person function perfectly, but it will certainly bring improvements.

Whatever your circumstances are you can be better. That’s like saying if you go to the gym and work out will you be healthier? Of course you will. Will it make you perfect? Will it make you be who you want to be? Well maybe not... but is it going to help you? Of course. So we think about neurofeedback that way... it’s a brain exercise...your brain is going to work better for you, is that going to help you? Of course. Is it going to solve the problems that you’re presenting with? Uh...I’m not sure exactly... how far we’re going? [#1, 669-675]

Even with a strong “physiological, computer-based” tool such as neurofeedback, Helen remains client-centered in her approach. The guiding therapeutic factor in treatment is the person’s functioning, not the brain wave patterns. Helen says emphatically, “We’re working with people’s function...we’re not fixing brain waves.”
Helen has observed that getting the brain “settled down” causes an improvement in functioning that can be a life-transforming process. Once symptoms are gone, a person may be left wondering, “Who am I now? What am I going to do with my life?” The end result of the neurofeedback process is not simply shedding symptoms, but becoming “a new way in the world.”

In Helen’s experience, using strong tools that have an impact on physiological functioning can produce negative effects such as headaches and interrupted sleep patterns. Even when a person is not trained “optimally” or when neurofeedback moves physiological functioning in the wrong direction, it “gets people’s attention,” so that they believe that neurofeedback can produce results. Negative effects may actually assuage a person’s “biggest fear” that “this is a scam; you’re wasting my time,” thereby increasing trust in the process.

Helen noted that using neurofeedback with trauma survivors is much easier on the clinician than talk therapy is. Helen can treat many more trauma survivors with neurofeedback than she could with traditional talk therapy. “I’ll tell you the big news here is how much easier this is on the clinician” [#1, 1042].

**Client Factors.** Helen stated that the typical client comes to neurofeedback after trying many other things. “If there were an easy answer, people would have found it already; people don’t typically do neurofeedback first” [#1, 363-364]. Once the client comes, Helen listed a variety of factors that help or hinder the neurofeedback process.

Medicine may hinder the process, as it may be difficult to discern what the medicine is doing and what the neurofeedback is accomplishing. However, other factors may help the process. Neurofeedback training tends to be more successful if clients can visualize themselves getting better. “Your brain can only make for you what you can imagine.” An active client who
asks many questions will generally have better outcomes than a “passive person who is just looking to be fixed” because neurofeedback training is a team effort that requires client feedback. Communication is the major key to successful outcomes. Multicultural factors affect neurofeedback outcomes if the practitioner and client are not “reading each other well” because “Anything that interferes with communication is going to interfere with success.”

The nature of the client problem will also affect training outcomes. A physiological problem such as migraine headaches or muscle tension may be much easier to treat than a developmental problem that indicates that “we don’t have a normal nervous system to work with.” Emotional deficits that limit a client’s ability to engage in therapy in a stable manner will also hinder outcomes.

**External factors.** Helen listed the medical community and the neurofeedback field as a whole as external factors that influence the treatment process. Doctors may discourage clients from seeking or continuing with neurofeedback training by telling them “they’re going to waste their money.” At the same time, Helen thinks that the neurofeedback field as a whole is “going to explode.” She uses the metaphor of a plant whose roots have been growing underground for years and now is just “starting to break the surface” to describe the growing visibility and acceptance of neurofeedback by the public. “Neurofeedback’s time has come.”

**Summary**

Helen describes her neurofeedback experience as being a “journey” that has been “surprising” and “amazing.” Her personal experience with neurofeedback led her into a clinical practice that is part of a strategic development model to train other professionals to “get neurofeedback into the world.” While aware of the importance of having effective technical instruments, she is client-centered in her approach and respectful of the “brain’s ability to fix
itself.” Helen says of her commitment to neurofeedback, “It’s not work, it’s a passion.” The prominent themes that emerged in the interviews with Helen are displayed in Table 4.8.

Analysis of Participant #6: “Helen”

Table 4.8
Themes, Sub-Themes, and Supporting Information

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<th>SUB-THEME</th>
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<td>“make this happen in the world”</td>
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<td>Conflicts</td>
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<td>Strategy</td>
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<td>PTSD</td>
<td>“no place of safety”</td>
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<td>Neuroscience Knowledge</td>
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<td>Disregulated Internal agenda</td>
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<tr>
<td></td>
<td>Left side brain</td>
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<td></td>
<td>Deep state training</td>
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<td>Therapeutic Process</td>
<td>Client centered</td>
<td>Coach, feedback “we’re not fixing brain waves”</td>
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<td>“It’s a big trip”</td>
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<tr>
<td></td>
<td>Neurofeedback field</td>
<td>“starting to take off”</td>
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</table>
Participant #7: “David”

Introduction

David completed a masters degree in counseling with a specialty in marriage and family therapy as well as a doctorate in ministry. He has served in the Army both as an enlisted serviceman and later as a chaplain. After retiring from the Army he began a private practice in family therapy. He has been a licensed professional counselor since 1983 and a licensed marriage and family therapist since 1997. In addition, he has approved supervisor status from the American Association for Marriage and Family Therapy (AAMFT). He incorporated neurofeedback into his existing therapy practice in 2002. David has 40 years of counseling experience, both as a chaplain and later in private practice.

Approximately 65% of David’s clients have some form of trauma as a central issue. Other issues include depression (30%), anxiety (25%), autism spectrum (20%), attention deficit/hyperactivity disorder (30%), bipolar disorder (10%), chronic fatigue or fibromyalgia (10%), sleep problems (40%), headaches or migraines (10%), traumatic brain injury (5%). He also sees clients who have various learning disorders. David sees approximately 70 clients per week personally, and more than 100 per week are provided services in his practice.

David’s neurofeedback practice is located on a busy street lined with one-story offices and stores in a medium-sized city. When I arrived there, David was answering phones in the receptionist area of his small waiting room. Being early for our interview appointment, I was prepared to wait for an hour or so, but David suggested that we start talking while he ate his lunch. We went to his office, a long room with a large sofa and numerous chairs, enough seating space to hold supervision meetings for 10 people or so. David supervises five interns in his practice, in addition to several others who practice neurofeedback elsewhere and join the supervision meetings. I turned on my recorders and began the interview while David ate his
lunch. Several times an intern or therapist came into the room to ask a question about a neurofeedback protocol for a client. Within 30 minutes interns started to trickle in one by one, after they had finished with their clients. As they came in, David introduced me and we continued the interview, since David wanted them to hear his answers to my questions. When all the interns were present, David asked them to contribute their knowledge to the interview questions as well. One intern shared his personal experience of having a brain map done at David's office and then going through his own personal experience of neurofeedback training specifically for trauma. Interns typically use the office equipment to practice neurofeedback training on each other, under David's supervision.

**Individual Themes**

The following narrative description is intended to provide a thick description of the major themes, subthemes, and supporting information that emerged during the interviews with David.

**Practitioner.** David already had a thriving counseling practice when he heard about neurofeedback through a client who was searching for an effective treatment for attention deficit/hyperactivity disorder and “found this stuff called neurofeedback” on the internet. David did some research of his own and agreed that it sounded “impressive,” but it was after his client went out of state for neurofeedback treatment, returned, and told David, “You’ve got to get trained in this stuff” that David took the client’s advice and attended a training. David remembered that he was “skeptical” but also “open” to neurofeedback. He attended the training despite his skepticism, explaining, “With my personality, I’m willing to try new things.” The first time he tried alpha-theta deep state neurofeedback during a demonstration at the training, “it took away thirty years of back pain.” The results were so “phenomenal” that he took a “step of faith” and purchased two systems for $10,000 each.
David wasn’t quite sure how he would integrate neurofeedback into his busy private practice, especially since he “didn’t know anything about computers” and “didn’t know if I wanted to get into the computer business or not.” He said that he was “overwhelmed” at first by the technology, but as he continued his own personal training, friends noticed that his tennis game improved, and they became interested. David trained one friend for 40 sessions, with the result that both his depression and dyslexia disappeared. Other friends followed, many of them physicians from the adolescent alcohol and drug treatment center where he was working at the time. David describes how friends came to his home office for neurofeedback training: “Sometimes 4 or 6 people at a time. Sometimes they would bring a carload over, and they’d sit in the living room socializing, and I would bring them in one at a time for treatment in my home office” [#1, 90-93].

Since David began integrating neurofeedback into his practice 11 years ago, the percentage of clients who are trained in neurofeedback has increased from 20% to 99%, the number of clients has grown 2 ½ times, and the number of his staff has increased to include several licensed therapists and five interns. He pays for all of his interns to attend a four-day neurofeedback training sponsored by one of the major training organizations. Besides supervising interns and neurofeedback providers, David has also used his private practice as a research site, particularly to research the effectiveness of neurofeedback on PTSD symptoms. His practice has grown out of his personal neurofeedback experience: “We try it on ourselves first, and then what works, we pass along.”

Trauma understanding. David speaks of both PTSD and complex trauma. Many of his clients are veterans. Other clients are survivors of childhood emotional or physical abuse, sexual assault, or other traumatic events. Prominent symptoms include depression, anxiety, and
substance abuse. David estimates that at least ½ of his clients come in with a presenting problem other than trauma, “so we have to figure it out.” Unexplained pain is often a clue. David is aware that some form of trauma, whether PTSD, complex trauma, TBI, or a combination, is often an underlying issue.

**Therapeutic process.** In his 40 years of counseling experience, David’s most valuable lesson has been the importance of “being empathic...able to hear them and feel a sense of what they feel” [#2, 17]. The office atmosphere combined with therapist empathy sets the stage for therapeutic success. Clients have commented that they feel a “sense of love and God’s presence” in David’s office, and David agrees that “a loving atmosphere is crucial.” The neurofeedback process starts with empathy, and caring “sets up the possibility for healing.” Even though he is utilizing computer technology, he emphasizes the importance of spirituality and the therapeutic process: “You can’t remove the centrality of God’s spirit from the person of the therapist upon the process...I am not a technician...I am still a therapist” [#1, 471-472].

David estimates that the time needed in therapy is cut by ¼ when neurofeedback is a piece of the therapeutic process. For couples, he often does some brief therapy such as explaining family of origin issues, and then uses neurofeedback with both partners to “calm things down” enough that “there’s not much of a problem to work with” after that. Sometimes he spends 30 minutes talking with three or four members of a family, “makes some protocol decisions,” and then sends them to his therapists and interns for individual neurofeedback sessions. Again neuroscience and spirituality are mixed, as once neurofeedback calms the amygdala, “it gives the Holy Spirit a chance to work too.” One client who did some deep state training “had a talk with God” and came out a “changed man.” Combining neurofeedback with
counseling is a “very powerful tool” that helps the client to “feel more empowered and a part of the process instead of the victim.” David sees neurofeedback as a “conduit into talk therapy.”

Before beginning neurofeedback, David assesses and screens clients in several ways. First, he screens for medications with a benzodiazopene base such as Atavan, Xanax, and Valium, among others. In David’s experience, benzodiazopenes “take over the brain” so that neurofeedback has no effect; therefore, clients must discontinue those medications before he will begin neurofeedback with them. Secondly, David says that he gets better results when working with any trauma survivor when he does a brain map (QEEG) because he can identify the specific area of the brain that is traumatized. One of the interns observing the interview agreed that when he was able to see the area in his brain affected by trauma in a brain map, he knew more accurately where to train after being diagnosed with complex trauma. A third important component is to realize that “the process of healing actually scares some people.” David helps clients “predict what their reaction to feeling better will be” by asking them, “What are you going to have to give up if you are to get healthy?” David observed that asking this question in the first or second session helps to gauge client motivation and discourages dependency.

David uses both high and low frequency tools. He starts with the low frequency equipment, which “works on about 70% of the people without doing a brain map.” The low frequency “settles things down.” If the low frequency isn’t effective, then David starts “working on the other 25%” with high frequencies. David has observed that neurofeedback fails to help approximately 5% of clients, but that statistic is getting “less and less.” David starts with right brain training at T4-P4 or interhemispheric training at T3-T4 to “calm them down, stabilize them.” Ten sessions of awake state training is followed by alpha-theta deep state training. Alpha-theta is crucial for trauma survivors: “For others it’s the frosting on the cake, but with
trauma...it's part of the cake.” The interns chimed in at this point with several comments. One said that sometimes EMDR helps to clear up a specific trauma, another that counseling is especially important at this point, and of course, “having a good supervisor that you can ask, ‘What do I do now?’” is crucial. Everyone looked at David and laughed.

David emphasized that neurofeedback has advantages for the practitioner as well as the client. During 40 years of counseling experience, David has treated a wide range of problems stemming from trauma, including dissociative disorders. He remembers that “it was traumatic for me too, being in this pain with them as they go through and react...it’s like doing surgery without anesthesia” [#1, 873-875]. Neurofeedback is a tool that lessens intensity for both therapist and client. At this point, David’s interns shared how even using neurofeedback, they sometimes get their “buttons pushed.” One intern had a client with PTSD who “scared her,” and David helped her do some “PTSD work” so that she is more comfortable now. David added, “It’s a good experience for a young therapist.” Other interns shared what “pushes buttons” for them, including manipulation and addictive behaviors. David affirmed, “That’s what supervision is about.”

Negative effects may occur from neurofeedback. David noted that particularly after the first session or two, a client may get a headache, possibly from “rewarding the wrong frequency” or “getting blood flow in the brain that hasn’t been there before.” Adjusting the reward frequency generally fixes the problem. David also mentioned several clients who had “brain reversal,” so that training the usual side of the brain produced an opposite effect.

**Client factors.** Besides medication and client motivation, David mentioned several other client factors that may influence neurofeedback treatment outcomes. One factor may be client fear of the electrodes and “putting stuff into my head.” Another factor is the nature of the client
problem. David has observed that neurofeedback shortens the time that people need to be in therapy. For example, in the past he might typically spend one year with a client; now he averages approximately 3 months. The exceptions to this shortened therapy time are usually clients with bipolar disorder, schizophrenia, or autism, all of which generally require longer treatment times to achieve the desired results.

David likes to work with families because he’s “seen the effects of getting people a lot better and then they go back into the crazy situation…doesn’t work.” Sometimes the family can pull the client back into the dysfunction because they “don’t want to lose their scapegoat.” A family who refuses to cooperate will very likely sabotage the therapeutic process.

I asked David specifically how multicultural factors might influence outcomes. David has seen neurofeedback help people of all ages. He has seen neurofeedback decrease seizure frequency in a 10 month-old baby, for whom he made a special pink cap to hold the electrodes; and he has seen neurofeedback diminish dementia and increase alertness in an 87 year-old through “brain brightening.” In the past, he regularly travelled to nursing homes to offer neurofeedback training to the residents. At one point, he also travelled to a hospital once a week for 90 days to provide neurofeedback treatment at the bedside of a woman who was a quadriplegic and had been in the hospital for two years with no progress in movement. David remembered that when he started the process, the woman could move only one finger. After 90 days, she could push herself in a wheelchair.

In terms of socioeconomic factors, David allows interns to treat those who are uninsured or will do pro bono work, saying, “We don’t let money stand in the way here…if we have to, we treat them for free.” Free treatment in particular applies to military veterans. David is himself a
veteran and finds that he has many male military clients. Although women generally report more on feelings than men, neurofeedback works equally well for both.

**External factors.** David observed that the medical community is both a positive and a negative influence on the neurofeedback process. On the one hand, David described getting “a lot of static” from the medical community as well as psychologists who talk about neurofeedback being merely “a placebo effect.” Physicians may discourage clients from either initiating or continuing neurofeedback training, saying it will “waste your money.” On the other hand, David increasingly gets referrals from psychiatrists and neurologists. In fact, at times neurologists ask David for the QEEG that he performed on a client. In addition, physicians and psychiatrists have consistently been among David’s clients.

David described the neurofeedback field as being “cutting edge.” He thinks that it will continue to grow and to become more mainstream so that within 5 to 10 years it will be “standard practice.”

**Summary**

David attended a neurofeedback training at a client’s suggestion. After neurofeedback gave him relief from 30 years of back pain, he took a “step of faith” and incorporated it into his already thriving private counseling practice. David emphasizes caring and an atmosphere of love as part of the foundation that “sets up the possibility for healing.” He screens people for benzodiazepines before starting neurofeedback and discusses motivation and family systems issues early in the process. He believes that neurofeedback and counseling complement each other. For trauma survivors, neurofeedback is a “conduit into talk therapy,” and talk therapy without neurofeedback is “like doing surgery without anesthesia.” Using both low and high frequency tools is effective on approximately 95% of his clients. David is committed to
neurofeedback research, mentoring new neurofeedback practitioners, and providing neurofeedback services to those who need them, particularly military personnel. He says, “We don’t let money stand in the way here.” The themes that emerged from the interviews with David are displayed in Table 4.9.

### Analysis of Participant #7: “David”

#### Table 4.9

**Themes, Sub-Themes, and Supporting Information**

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<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
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Participant #8: “John”

Introduction

John completed a doctoral degree in psychology and has been a licensed clinical psychologist in his state for 27 years. He also holds certifications in psychodrama, Eye Movement Desensitization and Reprocessing (EMDR), and the Biofeedback Certification International Alliance certification in neurofeedback (BCIA-EEG). John incorporated neurofeedback into his practice more than 15 years ago and has served as president of his regional biofeedback association. His continuing education activities include attendance at psychology conferences and trainings, biofeedback and neurofeedback conferences, online courses, and peer consultation.

Approximately 35% of John’s clients have trauma as a central underlying issue. Other issues include depression (25%), anxiety (25%), autism spectrum (25%), attention deficit/hyperactivity disorder (40%), bipolar disorder (5%), chronic fatigue or fibromyalgia (15%), sleep problems (25%), headaches or migraines (5%), and traumatic brain injury (30%). Many of these problems are overlapping. John sees approximately 20 clients per week.

John’s office is located on an upper floor of a tall office building in a large, affluent metropolitan area. He shares a suite with several other mental health professionals. Windows line one wall of his large office room filled with books, several neurofeedback machines, and other equipment. A comfortable-looking leather chair sits in front of his neurofeedback monitor. I set my cup of coffee on a nearby container, turned my recorders on, and we talked for 90 minutes or so. As the lunch hour approached, John suggested that we eat together with a colleague who shares his office suite and with whom I had scheduled an interview in the afternoon. The three of us walked to a nearby Thai restaurant, where I set my recorders in the middle of the table and continued the interview with both neurofeedback practitioners while we
ate our lunch. As I recorded the interview, I realized that I was hearing more than a personal story. I was hearing a descriptive account of the evolution of the neurofeedback field, including the challenges it currently faces as it matures from its experimental beginnings to a more accepted role in the mental health field.

**Individual Themes**

The following narrative provides a description of the major themes that emerged in the interviews with John.

**Practitioner.** John has a wide range of experiences in the mental health field that include working with adults with alcoholism, children and adolescents with learning disorders and emotional disorders in a small school setting, and being actively engaged in private practice with all types of clients. Having been certified in psychodrama and EMDR, he was open to creative, innovative treatment modalities before he learned about neurofeedback.

John heard about neurofeedback when he “had one foot in the alcohol world and one foot in a kids’ special education program.” He had many clients with addictive disorders in his private practice while he was also working as an onsite mental health counselor in a small classroom setting for youth with learning disorders and emotional disorders. During that time he read a *Science* magazine article depicting a brain map of the difference between various disorders including “chronic alcoholics, dementia, bipolar versus unipolar versus anxiety.” The brain map’s graphic display of mental disorders brought a turning point in John’s career: “I was totally unaware of that literature and it was very graphic, very visual, and you could see the difference…the QEEG showed these differences.”

This new technique based on “operant conditioning of the brain waves” made enough scientific sense to John that he “gambled $500 or $600 bucks which is what a course would cost
back then” to take a basic training. John was impressed with neurofeedback research study outcomes, particularly the “phenomenal” results that Peniston achieved, “much better than anyone was getting in talk therapy,” while using neurofeedback and the alpha-theta protocol with residents in alcohol treatment centers. The potential to help his clients more effectively motivated John to attend more neurofeedback trainings, including several at the Menninger Clinic: “I was excited because the results that we were getting with the Peniston Protocol even though it was a small study....were pretty phenomenal” (#1, 315-317).

John is committed to using neurofeedback in his practice, although he is realistic about the challenges and disappointments. He stated that numerous equipment manufacturers have made promises that they did not keep. He knows that neurofeedback is not a panacea that works with every client. And he questions the glowing results reported in some research studies. Nevertheless, neurofeedback is successful with enough clients that John continues to be committed to its use.

I would hear other people’s success stories and that would kinda keep me going and I started to see some things happening with people that I was seeing...not always, but I think ....the rule of thirds....they were touting in a 80% success rate with the Peniston study, but no one’s got that (#1, 584-587)

John has stayed professionally active in the neurofeedback field. Throughout the interview he mentioned journal articles and information from the five neurofeedback listserves to which he belongs. He discussed current research in Turkey on fibromyalgia and schizophrenia and the use of neurofeedback in Poland. He referenced colleagues with whom he has consulted, and he regularly attends conferences for continuing education. His leadership in the field includes serving as president of a regional biofeedback association.
**Therapeutic process.** According to John, the therapeutic process begins with a thorough assessment that looks beyond traditional diagnostic categories. For example, children are often given a “polite diagnosis” of AD/HD; however, further investigation could reveal depression, a learning disability, a head injury “that nobody ever asked about,” and nutritional issues. A thorough assessment that includes a wide range of factors increases the likelihood of positive treatment outcomes because “therein lies the third that aren’t getting better.” The assessment also includes screening for trauma so that John can be aware of the possibility of abreactions. John sometimes uses a QEEG as part of the assessment process.

Therapist skills and building the therapeutic alliance through individual attention to the client are essential for positive outcomes with all clients. John has observed “over time that all the skills and what you learned in therapy still is useful and that if you don’t have that background...well, I don’t think you should be doing this without a good therapy background.” Building the relationship is important because “people have to trust you and like you” in order for therapy to succeed. John does not use technicians in his practice. He is present with clients both physically and emotionally, sometimes talking during the neurofeedback session.

In John’s opinion, clinician training and experience, including a broad background in trauma and trauma theory, “are even more critical” when dealing with trauma survivors, due to the potential for abreactions. John is aware that clients with PTSD due to a one-time traumatic event and those with complex trauma from ongoing traumatic exposure are “two different populations.” Trauma survivors generally benefit from counseling in addition to neurofeedback. John is cautious in his use of the alpha-theta protocol.

Providing effective neurofeedback treatment is a mixture of art and science, both of which grow with experience. Neurofeedback is “not just this impersonal thing with a machine
that anyone can do.” For example, creating the “chemistry” and “finessing things” between the therapist, the client, the client’s parents, and perhaps another therapist, takes art: “It’s a goodly computation…it’s not one size fits all…you can’t just hook people up to a machine willy nilly and get results.” Effectively applying both the art and the science require years of experience: “You don’t get the experience without putting in the years.”

Even under optimal conditions, John is aware that neurofeedback has limitations. Realistically, not everyone will complete neurofeedback treatment with a success story due to the “rule of thirds which is that anything you do you probably works wonderfully well 1/3 of the time…. works ok-ish 1/3 of the time and falls on its face 1/3 of the time…[#2, 18-19]. “There’s no guarantee” that neurofeedback will be an effective treatment option in every case.

**Client factors.** John noted several client factors that influence treatment outcomes. The ability to stay in treatment, even when slow change “gets annoying” and “parents want to drop out too soon” is a key factor to final success. There are several reasons why staying in treatment can be challenging. There is uncertainty concerning how many neurofeedback sessions will be required to produce the desired results, the number usually being “more than 20, less than 100.” Sometimes a significant breakthrough may occur in the 80th session.

Client recognition that neurofeedback is making changes can be a factor to staying in treatment. Since change may be slow, it may be difficult to recognize. In one situation, John “thought the kid was making some progress…he wasn’t as hyper as he used to be,” but the parents denied any change. However, the grandparents, who hadn’t seen the child in six months, remarked on a strong change, saying, “Oh thank God, you finally put him on medication. He’s so much calmer.” Clients may recognize changes and yet deny that neurofeedback made a difference: “Pretty marvelous changes can happen and the parents will be in denial that
neurofeedback had anything to do with it.” Sometimes clients or medical professionals will credit changes to “placebo effect” and that the brain “finally kicked in 10 years after the accident.” Sometimes clients recognize that neurofeedback has made changes, but they do not like those changes: “They’ll complain that now the kid is talking back whereas before he didn’t have language.”

The primary multicultural issue that interferes with effective treatment outcomes is socioeconomic status since “poor people just can’t afford it.” In terms of racial, ethnic, and other cultural differences, neurofeedback is effective because “it’s not face to face talk therapy… it’s not as culturally loaded… it’s more technique based… so it can work” (#1, 935-937).

**Business Environment.** The business environment that supports the neurofeedback process is filled with both technical and ethical challenges that must be resolved in order to provide effective services to clients. John discussed various technical challenges that occur not only in the initial stages of integrating neurofeedback into a practice, but throughout. The signal on some of the early equipment was contaminated by nearby radio towers; the equipment that John purchased to train in groups didn’t work; equipment manufacturers do not always keep their promises; John purchased equipment thinking that it was compatible with his existing equipment, but it wasn’t; some equipment “will do everything but it’s too damn complicated for a human being;” other equipment is easy to use but “way overpriced.” John described the technical frustration, “It’s like the frustration of… you can’t know what you don’t know that would help you from making a mistake.” Technical support in a private practice is very helpful. Innovation is both challenging and expensive.

Ethical dilemmas must also be resolved. John described the tension between savvy business practice that utilizes technicians to execute neurofeedback protocols, allowing a
practitioner to earn money while out of the office, and giving quality individual attention to each client on a consistent basis. Insurance can be “a thorn…a burr under the saddle,” as coverage policies for neurofeedback can be complicated. “Trying to be ethical…and not lying to insurance” can be difficult when other neurofeedback providers are not doing the same, as survival depends on incoming cash flow.

**Neurofeedback field.** The growth of the neurofeedback field as a whole mirrors many of the ethical dilemmas in individual private practice. John noted that neurofeedback is becoming internationally accepted, with research being done in Turkish hospitals and Polish schools. Providers have a choice of 36 different neurofeedback email listserves that run the continuum from basic information to “the deep end of the pool” of brain maps. Entrepreneurs who have seen the neurofeedback growth potential have marketed training programs ranging from the Menninger Clinic with “good credibility” to those that will set up a “turnkey operation” for $30,000 after an individual has trained for just two weeks, or who “set themselves up as a national training center when they have only two years experience.” Some organizations have been known to hire high school and college students as technicians. John summarizes the abundance of questionable practices by saying, “So there’s people out there.”

In order to enhance quality of treatment, protect the public from harm, and promote the credibility of neurofeedback as a viable treatment option, certification standards and ethical codes need to be instituted in the neurofeedback field as they have been in the mental health field. How much attention does a client need during a neurofeedback session? How active must practitioners be? Should they help the client navigate the neurofeedback system, or should they let the brain find its own way to engage with the program? Is it safe to allow technicians to sit with a client during a neurofeedback session, and if so, what level of training do technicians
need? Nightmare “hook ‘em and cook ‘em” stories of “overcooking people’s brains” circulate in the neurofeedback sphere. Should clients be allowed to rent or purchase neurofeedback equipment in order to train at home, and if so, what type of oversight is necessary to make home training a safe practice? John listed all these questions as being open for discussion.

In addition, who can regulate neurofeedback? Does it fall in the domain of mental health, the medical profession, psychiatry, chiropractors? Who can “weed out the people who shouldn’t have contact with human beings?” Neurofeedback may fall in a professional no man’s land that makes regulation difficult to enforce, but the lack of explicit standards and codes leaves the field vulnerable to accusations of quackery. Loss of credibility in a field limits the potential for research funding, as well as the number of potential clients.

Keeping current in the neurofeedback field requires a constant and substantial expenditure of money both in equipment and trainings. In John’s experience, new discoveries are both “exciting and frustrating.” New protocols and techniques bring potentially more effective treatments, and yet these innovations are “frustrating” because they so often require an upgrade in expensive equipment. A rapidly changing field requires a constant “cash flow” in order to attend pertinent trainings. User friendly equipment would make neurofeedback treatment easier for the clinician and therefore potentially more effective for the client.

In John’s opinion, more research is needed to give the field more credibility. Although the neurofeedback field has been criticized for not having enough double blind studies, it has produced some good quality research. However, “There’s not enough studies and they’re not in main stream journals.”

**Medical system.** The medical system affects the overall neurofeedback field in terms of research funding availability, insurance coverage, and a general preference for medication over
alternative treatments. More high quality research studies would increase the credibility of neurofeedback as a viable treatment option; however, high quality studies require funding that is not generally granted for neurofeedback research. John observed, “The system sucks that is geared toward pills and that’s where the money goes.”

The medical system determines what insurance covers (“insurance companies are in bed with the physicians”), and insurance coverage influences treatment options available to the public. John noted that Peniston achieved his “phenomenal” results in an alcohol treatment program in which residents received neurofeedback twice per day, five days per week for 28 days. These results are difficult to duplicate in the current environment in which insurance will not cover such an extended stay with such individualized treatment, and in which most people cannot pay out of pocket. There may be a discrepancy between effective treatment and what can actually be done on the budget that insurance allows.

Summary

John’s openness to innovative therapies extended to openness to trying neurofeedback after he saw various mental disorders depicted in a brain map in a journal article. John is committed to the use of neurofeedback in his practice, although he has observed that neurofeedback will not work well for every person. According to John, the “rule of thirds” is a realistic expectation for neurofeedback effectiveness. An important factor in treatment effectiveness is the client’s ability and willingness to stay in treatment when progress may seem slow and the number of sessions needed is not clear, generally being “more than 20 and less than 100.” As the neurofeedback field matures and grows, the need for certification requirements and ethical standards is becoming apparent. The field also needs more high quality research to increase its credibility. The medical system with its emphasis on medication sometimes limits
funding opportunities as well as insurance coverage for neurofeedback. Table 4.10 displays the themes that emerged from the interviews with John

Analysis of Participant #8: “John”

Table 4.10
Themes, Sub-Themes, and Supporting Information

<table>
<thead>
<tr>
<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
</tr>
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<tbody>
<tr>
<td>Practitioner</td>
<td>Lifelong learner</td>
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<td></td>
<td>Varied experiences</td>
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<td></td>
<td>Commitment to NF</td>
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<td>QEEG</td>
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<td>Therapeutic alliance</td>
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<td>Trauma knowledge</td>
<td>Experience</td>
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<td>NF limitations</td>
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<tr>
<td>Client Factors</td>
<td>Staying in treatment</td>
<td>“more than 20, less than 100”</td>
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<tr>
<td></td>
<td>Recognition of change</td>
<td></td>
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<td></td>
<td>Multicultural</td>
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<td>Business Environment</td>
<td>Technical</td>
<td>“You can’t know what you don’t know”</td>
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<td>Ethical</td>
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<td>Neurofeedback Field</td>
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<td>36 different listserves</td>
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<td>Need for regulation</td>
<td>International</td>
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<td>User friendly equipment</td>
<td>Certification standards</td>
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<td></td>
<td>Cost</td>
<td>Ethical standards</td>
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<td>Medical System</td>
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<td>Drug companies</td>
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Participant #9: “Shirley”

Introduction

Shirley holds a doctorate in psychology and has been a licensed psychologist in her state since 1979. She has taught in universities and conducted research both in the United States and overseas in Iran and India, has served as the president and on the board of a regional biofeedback professional association, and has completed approximately 50 professional publications and presentations. She has been actively engaged in providing therapy for over 31 years and has been providing neurofeedback services for 15 years.

Approximately 90% of Shirley’s clients have some form of trauma as a central issue. Other issues include depression (90%), anxiety (90%), attention deficit/hyperactivity disorder (100%), bipolar disorder (10%), chronic fatigue/fibromyalgia (20%), sleep problems (100%), and traumatic brain injury (90%). She is semi-retired and currently sees 8 to 10 clients per week.

After the interview with John and lunch with both John and Shirley, I walked several blocks to Shirley’s office with her. Her office is a small room with windows at one end. Her neurofeedback monitor sits on a desk beside her office desk, and a comfortable leather chair and footstool are placed in front of the monitor. Pegs on one wall hold a myriad of different electrodes, and there is a bookcase against another wall. The room is neat and comfortable. I sat in a chair situated so that Shirley could demonstrate the many functions of her neurofeedback equipment, and our conversation was interspersed with both information and demonstration.

Individual Themes

The following narrative description of the major themes, subthemes, and supporting information is intended to provide a thick description of the participant.

Participant. Shirley experienced firsthand the effectiveness of biofeedback years ago when her young son’s food sensitivities were alleviated using a biofeedback technique on her
equipment. Neurofeedback was a natural extension of methods that she was already using. Shirley emphasized the importance of years of experience in providing effective treatment because a practitioner has “more information to draw on in general…it just pops out when you need it.” Shirley’s vast professional experience is measured not only in years, but also in variety. She has taught in a university in Iran and has helped with creating decision trees for village workers in India. Her conversation is interspersed with names of well known people in the neurofeedback field, along with names of the equipment they use and stories of how she has consulted or collaborated with them.

Openness to new methods and experiences and an attitude of lifelong learning characterizes Shirley. She has always “kept up with the literature.” She has participated as a beta researcher for new neurofeedback equipment and in a research study investigating the effectiveness of neurofeedback on children in an inner city school. She served as a “guinea pig” for a colleague trying out the new ultra low frequencies. At 78 years of age she continues to attend national and regional conferences and has served in leadership positions for a regional biofeedback professional association.

Shirley learns from both professional colleagues and clients. When I asked her to name the most important lesson that she has learned through her years of experience, she immediately responded, “I don’t know it all!” She frequently emphasized the importance of professional consultation: “Consult, consult, consult…and be available for other colleagues also…there are always new things happening” (#1, 611). Clients as well as colleagues provide learning opportunities: “You learn a lot from your patients. They are always bringing things in and I will go on to find out more and share it with them if they haven’t heard of it” (#1, 629).
Sometimes people come in with an unusual illness...then they will know more about it than you know...they are coming because of their research so you don’t get offended for not being the quote expert who tell them what they need. They are here to tell you this is what I’ve read and this is my problem, and I have read that this might help. And that’s very important to let them share with me (#1, 632-638).

Throughout her career Shirley has been open to new ideas and has continued to learn both from other professionals as well as from clients. She describes herself as being “supposedly allegedly retired” and continues to see clients on a part-time basis.

**Trauma.** Shirley discussed a wide range of traumatic experience, including PTSD, complex trauma, and traumatic brain injury (TBI). Although trauma is prevalent as an underlying factor in many issues, it is frequently unrecognized or misdiagnosed. Being unaware of underlying trauma in a client can slow treatment results, and sometimes treatment does not progress until the trauma is processed. Approximately 90% of Shirley’s clients have experienced some form of trauma and older people in particular have probably had “some form of trauma along the way.” Traumatic symptoms include hypervigilance, anxiety, lack of trust, and relationship difficulties.

**Therapeutic process.** The therapeutic process begins with a thorough assessment including a mini QEEG and a screening for benzodiazepine prescription drugs such as Valium, Zanax, and Clonopen. Clients must switch these medications before doing neurofeedback because “they do something to the brain and the neurofeedback doesn’t compute or stick very long.” Shirley tells clients in the first session that neurofeedback is not an “instant fix.” The process will take time, and clients who do not understand the time commitment “are going to
quit after 5 or 6 sessions saying this doesn’t work.” She also clearly informs clients of the limitations of neurofeedback: “You can’t say this works for everybody because it doesn’t.”

Building the therapeutic alliance is crucial to the therapeutic process. Shirley describes the alliance as a “mesh,” a “pure body feel” that is “completely nonverbal.” She estimates that these interpersonal aspects constitute 20% of the therapeutic process, in addition to 80% science of neurofeedback.

The neurofeedback process with trauma survivors begins “slowly” and includes multiple approaches. For trauma Shirley generally begins with skill-based methods such as Heart Rate Variability, diaphragmatic breathing, progressive relaxation, or autogenic training, all “skills that they can use at home when they are feeling anxious.” She then proceeds to neurofeedback training, sometimes including the alpha-theta protocol. Before alpha-theta, Shirley and her clients create a script “that allows them to start looking at the traumatic event.” The script may provide an “alternative outcome” or may be simply an opportunity to “work through some of the helplessness and anger and fear they experienced” during the traumatic experience. After alpha-theta Shirley processes with the client “whatever came up during the session.” As a result, clients “seem to remember everything but the extreme emotional affect” connected to the trauma. “They can get over it without getting upset like they have in the past...it’s not in their mind constantly,” and the old “triggers” are no longer present. Shirley emphasizes that multiple methods are important because “you just don’t know what’s going to work.”

Therapist qualities of stability and flexibility are particularly crucial when dealing with trauma. Practitioners have to be able to handle unexpected abreactions, an inevitable occurrence in neurofeedback practice. For example, Shirley described an incident with a 20 year-old client who came to her for AD/HD and denied any history of trauma; however, at the end of a
neurofeedback session he unexpectedly experienced flashbacks of a car accident that had occurred several years previously. When abreactions happen, Shirley delays her appointment with her next client so that she can spend time processing.

In addition, neurofeedback outcomes are enhanced by a holistic approach that includes nutrition advice, medical support, and counseling. Neurofeedback and counseling complement each other in that neurofeedback “renormalizes the brain” so that clients can “see what the problems are,” become “willing to work on them or make the changes necessary to change what’s going on in their life,” and able to “work with the various issues that have come up related to trauma.” As neurofeedback “renormalizes the brain,” clients process changes, which may involve dreams, in a process similar to “peeling an onion.” In Shirley’s experience, neurofeedback tends to be “tremendously empowering” for clients and “dramatically” lessens time in counseling.

Finally, for Shirley, professional cooperation both from the medical profession and from other neurofeedback practitioners is important. Shirley regularly consults with other neurofeedback practitioners and encourages clients to work with their physicians to adjust medications as neurofeedback lessens the need for them. If physicians instead increase medications, treatment is hindered. In addition, Shirley at times coordinates treatment with the client’s psychotherapist.

**Client factors.** The typical client has “multiple problems and multiple medications.” Although Shirley discussed various client factors that contribute to treatment outcomes, she highlighted the importance of “fortitude” as embodied in one client in particular. Having sustained a traumatic brain injury, this client came to Shirley unable to talk or walk, using a wheelchair for mobility. As neurofeedback progressed he began talking clearly enough that his
mother could understand him and he began walking with a cane. The client’s mother set up a small trust fund that would pay Shirley “a fraction” of what she usually receives, and Shirley agreed to continue to see him “for a small fee.”

When the client was able to ride a bike to her office, demonstrating that both his physical capabilities and his memory had recovered, Shirley thought that he had reached the peak of his recovery and suggested that they stop neurofeedback. Shirley said, “I wanted to stop many, many times, but he said, ‘No, I still feel the difference and I am writing now.’” He began to write short stories and do more reading. He commented, “I am feeling the change in what I can pull up from my memory when I write. I want to continue.” Finally he got a job and began working. All the other improvements led to his final goal of “a job...that was all he wanted,” and then he was ready to stop after five or six years of neurofeedback training. “Fortitude” and finances on the client’s part, combined with Shirley’s willingness to listen to his sense of progress and to accept a lower fee, produced amazingly positive results that fulfilled the client’s goals over time.

**Business.** Although I never specifically asked a question concerning the technical and business aspects of private practice, it was evident that Shirley was very knowledgeable in these areas. As we talked, she went to websites to show me companies that sell biofeedback and neurofeedback equipment. She informed me of the capabilities of various neurofeedback equipment models, comparative equipment costs, and the companies that often have sales. She showed me educational books and told me where I could purchase them. Shirley knows the mental health aspects, the technical aspects, and the business aspects of private practice.
Summary

Shirley personally experienced the effectiveness of biofeedback in her family, and neurofeedback was a natural extension of her biofeedback practice. Her professional experiences are both extensive in years and varied in settings. She learns from both colleagues and clients. The therapeutic alliance is crucial to positive treatment outcomes, as is the use of multiple methods by the practitioner. The quality of “fortitude,” defined as the ability to stay with the neurofeedback training, is a key client attribute that contributes to successful treatment. In addition, neurofeedback and counseling complement each other in the recovery process. The prominent themes that emerged from the interviews with Shirley are listed in Table 4.11.
Analysis of Participant #9: “Shirley”

Table 4.11
Themes, Sub-Themes, Supporting Information

<table>
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<tr>
<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
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</thead>
<tbody>
<tr>
<td>Practitioner</td>
<td>NF personal experience</td>
<td>“I don’t know it all!”</td>
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<td></td>
<td>Professional experience</td>
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<td></td>
<td>Lifelong learner</td>
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<td>Benzodiazepines</td>
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<td>“body feel” “mesh”</td>
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<td>Holistic approach</td>
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<td>Typical client</td>
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</table>
Participant #10: “Barbara”

Introduction

Barbara completed a masters degree in counseling and is a licensed professional counselor (LPC) and a National Board Certified Counselor (NBCC). In addition, she is certified in both biofeedback (BCIA-B) and neurofeedback (BCIA-EEG) by the Biofeedback Certification International Alliance (BCIA), and is trained in Quantitative EEG (QEEG). She has been actively involved in counseling practice for more than 25 years and has been offering neurofeedback in her practice for 15 years. In addition to her private practice, Barbara has taught biofeedback, neurofeedback, and addictions courses at the university level, has been a guest speaker at regional neurofeedback trainings, and has organized continuing education events for neurofeedback providers in her area.

Approximately 30% of Barbara’s clients have some form of trauma as a central issue. Other issues include depression (20%), anxiety (10%), autism spectrum (15%), attention deficit/hyperactivity disorder (30%), sleep problems (5%), headaches/migraines (10%), and traumatic brain injury (5%). She sees approximately 20 clients per week, many of whom come two or more times during the week.

Barbara’s neurofeedback practice is located on the upper floor of an office building in a large metropolitan suburb. She occupies several rooms in a suite that she shares with a neurologist. On a bookcase in the waiting room numerous informational pamphlets about fibromyalgia and other disorders are displayed in holders, and I picked up several brochures to read while waiting for Barbara to call me. Patients flowed in and out of the waiting room inquiring about medication prescriptions and appointments at the glass-enclosed receptionist desk at the front of the room, while five or six others waited patiently for their names to be called. Barbara appeared at the door between the waiting room and the back offices and called
my name with a friendly smile. She shook my hand, introduced herself, and led me to her room, brightly lined with windows along one side. She sat in front of her desk so that there was no barrier between us as we recorded the interview. I listened intently as Barbara enthusiastically described her personal transformation from neurofeedback, the challenging clients that she has treated, and her understanding of how the process works.

**Individual Themes**

The following section provides a thick description of the themes that emerged in the interviews with Barbara.

**Participant.** Barbara “ended up at a neurofeedback lab by accident” in 1996 while seeking treatment at her university counseling center for anxiety disorder and panic disorder. When the clinician recommended neurofeedback, Barbara’s first thoughts were, “Give me a break...you’ve got to be kidding;” however, since the sessions cost only $15 she decided to “give it a try.” After neither hand warming nor awake state SMR training alleviated her anxiety, Barbara stayed with the process long enough to discover the alpha-theta Peniston protocol, a tool that she says “changed my life.” Alpha-theta “moved me along much quicker than any kind of counseling or therapy that I had ever been in...I made more progress in 3 months of neurofeedback than I had made in 20 years worth of counseling” [#1, 37-38]. Barbara described the “freeing” experience when she could “see options that I hadn’t seen before.” After 15 sessions of neurofeedback, Barbara began to notice that she was “looser and freer and less self-conscious.” The change was gradual but became apparent in one particular incident.

I became more outgoing...I became more willing to set boundaries with people... to say no...to take care of myself...I had a lot of social anxiety and I was with this group of people and I just kind of got up and started talking and joking in a way I had never done
before and all of a sudden I just sat down and clammed up like oh my God...who could that person be? And it seemed so different from the way I usually am. [#1, 63-70]

After completing 40 sessions of neurofeedback, Barbara described how “things kind of came together.” The counseling that she had engaged in previously “played a role” in her progress, but in retrospect, Barbara think that her “brain wasn’t ready for the counseling” at the time.

Barbara’s personal experience provided the impetus for her commitment to neurofeedback in her practice. She received encouragement from several mentors, has continued over the past 15 years to learn how to use various types of equipment, and has used neurofeedback with diverse populations of people, including incarcerated women, court-ordered male drug addicts in a rehab center, children with reactive attachment disorder, and clients from many different countries. At one point Barbara took portable neurofeedback equipment to rehab centers in order to treat chronic pain patients.

Barbara is willing to take risks and push the boundaries both personally and professionally. Learning neurofeedback was a huge “learning curve” and then starting her private practice pushed her out of her “comfort zone.” She describes herself as being “an anxiety type person,” and having to market and engage in public speaking “wasn’t my idea of fun.” Being convinced of the efficacy of neurofeedback, Barbara was willing to take risks to bring it to clients.

The phrase lifelong learner does not adequately portray the picture of someone who continues to learn, not for the sake of knowledge itself, but in order to help other people more effectively. There is an inner motivation to achieve that surpasses professional competence to a desire to offer the best. Barbara describes herself as being a “Type A personality” who is
“always looking for something better,” wants to “stay on the cutting edge,” doesn’t “want to coast,” and desires to “be one of the best” so that she can offer her clients “the best that’s out there.” She is “always trying to stay on top of things” in a field that has “changed dramatically” from the time when practitioners used only two electrode placements to now using more complicated equipment such as z scores, Roshi, and LENS. Barbara is constantly adding new modalities to her repertoire. She collaborates with other professionals to organize continuing education trainings for other practitioners, and she continues to use neurofeedback on herself because “I’ve been trying to fix myself and of course it’s never good enough.”

**Therapeutic process.** Barbara begins the therapeutic process with a thorough assessment using a Quantitative EEG (QEEG). She discourages clients who are taking a “big cocktail of meds,” from beginning neurofeedback training because medication adjustments can be difficult as the brain begins to do by itself what the medications had been doing. Barbara has observed that previous diagnoses, especially AD/HD, are often inaccurate or incomplete, as the symptoms could be indicative of depression, head injury, trauma, or reactive attachment disorder. She also stated that neurofeedback practitioners “tend to get the harder cases” because people generally try neurofeedback as a “last resort.”

Barbara attempts to establish a “nurturing relationship” with her clients because clients “need to trust” her and “feel safe” in order to achieve positive results. She described overcoming client resistance by presenting the neurofeedback process in a positive manner. She avoids *DSM-IV* diagnostic labels and instead emphasizes peak performance in academics, sports, and work due to improved focus through neurofeedback. With resistant teens who don’t want to be different from their peers she explains, “Maybe right now your brain isn’t your friend” right now, and “everybody has areas that we can improve.” She helps them get what they want, rather
than emphasizing what they lack. Barbara and the client together identify objective criteria for tracking symptoms by asking, “How will you know that you have improved?”

Barbara views counseling as an important piece of the neurofeedback process for trauma survivors, who usually have another therapist with whom they can process more fully than the check-in time with Barbara allows. During the check-in time Barbara engages in solution-focused, goal-oriented counseling, using some cognitive behavior therapy, along with humor to keep the conversation “light.” Barbara concentrates on “normalizing their feelings...I don’t stay stuck on negatives...I move on” [#1, 609-612]. In Barbara’s opinion, neurofeedback trains the brain to be more flexible so that the client can consider more options instead of being “stuck” in one way of thinking or behaving.

After assessment, screening and establishing objective measurements, the neurofeedback process for trauma begins with calming brainwave activity. Barbara uses a variety of tools, including general biofeedback and diaphragmatic breathing, both of which “deal with sympathetic arousal” to give clients an “immediate sense of control” as they work through anxiety. She then individualizes neurofeedback treatment protocols to match client needs so that “nothing is canned.” She has sometimes used alpha-theta along with guided imagery techniques such as a healing script or a gratitude script.

Barbara emphasized therapist characteristics such as flexibility, calmness, and stability as being important for positive treatment outcomes. Flexibility and open-mindedness help a therapist “not to get stuck on a particular type of protocol or treatment” because most absolutes have eventually been proven false. In addition, calmness in the face of unexpected client responses to neurofeedback produces a placebo effect: “If there is a problem to always reassure your client that everything’s going to fine because there’s that placebo effect that takes place like
even if you’re scared to death inside and wondering oh no what did I do and how am I going to fix this?” For Barbara, therapist stability means that clients know that “you will be there for them” while they “work through” abreacts or other difficult emotions.

Although Barbara consults with other professionals, including neurologists, she said that she has learned through the years to balance consultation with a confidence to “go with my gut.” She described one situation when she followed a colleague’s advice and “wasn’t really paying attention to my instincts,” client symptoms improved temporarily but then worsened again. She concluded, “Don’t trust another expert as being a total expert” because good therapists “get a sense” for what their clients need. She learned that when her instincts clash with a colleague’s advice, she should follow her own instincts.

“I’m busy all the time and I work too hard” is a statement Barbara made to summarize her management of the business environment that supports the therapeutic process. Juggling days for clients, days for bookkeeping and paperwork, and days for learning and caring for equipment doesn’t leave many days for other things. Working with a technician several days per week allows Barbara to double book clients, a practice that helps to keep the business afloat.

**Trauma knowledge.** “Many are traumatized and don’t know it” is the way that Barbara summarizes the prevalence of trauma as an underlying factor in many issues. Symptoms that she has observed include panic, dissociation, nightmares, multiple personality disorder, self-mutilation, bulimia, overeating, and hypervigilance. Barbara is cautious in treating trauma survivors, due to the possibility of abreacts.

**Neurofeedback.** While counseling women in a drug rehab program, Barbara observed that many of the women had been raped, sexually molested as children, or otherwise traumatized. Barbara repeatedly used the word *painful* to describe the process of counseling...
these traumatized individuals: “The recovery work that we did with them was just so painful and I knew there was a softer and gentler way” [#1, 112]. Because neurofeedback is a “kinder” way to deal with trauma, Barbara concluded emphatically that she “did not want to work with people without neurofeedback.” An upset client in a neurofeedback session is not a positive sign; it is a sign that Barbara needs to do more to calm down the brain.

It’s kinder…it’s not as painful…the neurofeedback will fix it and help them move on…it’s rare that I end up with somebody sitting here just crying and crying and crying…and I don’t see that as a positive…I see that as we need to do something different with the neurofeedback” [#1, 620-626]

In Barbara’s opinion, neurofeedback calms the brain and increases flexibility by “creating new pathways.” It therefore helps a person to “see their options, be able to organize things in their head…see that there’s light at the end of the tunnel and move through it faster” [#1, 633-636]. Due to calming the brain, clients are often able to process the trauma as “a third party kind of witnessing” that allows them to “talk about it instead of having to relive it.”

Neurofeedback is not a miracle cure, and Barbara spoke realistically about its limitations. It may not work quickly, and it may not resolve all targeted symptoms; however, it can improve the quality of life for most people. Barbara described treating a woman with multiple personality disorder who did not integrate all personalities, but was able to integrate enough that she no longer had to take a leave of absence from work every year during the month that the childhood trauma occurred. She treated a child client with severe reactive attachment disorder who did not resolve every issue, but resolved enough behavioral problems that he was able to attend a regular school.
Barbara views the neurofeedback field as “up and coming,” “growing exponentially,” and having “endless possibilities.” She warned, however, that neurofeedback holds great potential for both helping people and harming people and therefore needs to be regulated by a stated “standard of minimum requirements” for the practitioner. “People who don’t know what they’re doing mess people’s brains up” [2, 317-318]. In Barbara’s opinion, neurofeedback practitioners should be required to have a mental health background, pass the BCIA certification requirements, complete a year-long internship and then be supervised for one or two years before launching out on their own. In Barbara’s experience, competency requires five to seven years of practice because “it’s complex stuff that we’re doing.”

**Client factors.** In Barbara’s experience, typical clients have usually already “tried everything else” and come to neurofeedback as “the last resort.” Alternatively, they are seeking a “non-invasive” alternative to medication. Barbara highlighted the fact that when neurofeedback succeeds, it is doing so with “the hardest cases.” When neurofeedback fails, many other treatments have probably already failed as well, including medication. Barbara emphasized that this fact should be considered when judging the success or failure of neurofeedback.

Barbara listed various other client factors that may influence treatment outcomes. The type and amount of client medication may limit the effectiveness of neurofeedback. A physician who believes that neurofeedback can work and who is willing to adjust medications in response to client changes in mood, focus, anxiety level, or other symptoms is an advantage. Neurofeedback can be effective with clients with more complicated issues such as multiple personality disorder or developmental traumas such as reactive attachment disorder, but the process will probably take longer, and improvement rather than complete cure may be a more
realistic goal. Clients must be motivated to begin and then to stay with the process. The longer
the client can stay in treatment, the more likely positive results will be evident. Staying with the
process, however, is not always related to client motivation. Financial pressures also influence
treatment outcomes as clients may run out of money before the process is complete. No pre-
determined number of sessions guarantees success.

The family system also plays a role in outcomes. A stable home life will tend to support
neurofeedback progress, whereas an abusive home where a client is being retraumatized will
obviously hinder the process. Sometimes a child is actually a “designated patient” who is
“holding the family together and the child knows that.” If improvement threatens the family
system, then moving an individual toward health is more complicated. Barbara sometimes refers
parents to parenting classes or other therapy.

In Barbara’s experience, the only multicultural factor that affects treatment outcomes is
socioeconomic status. Located in a large metropolitan area, Barbara sees many people from
various areas of the world, including the Middle East, China, and India. Educational level is
more predictive of openness to neurofeedback than is race or ethnicity, and Barbara has not
noticed any gender differences. Socioeconomic status has an impact on the process only because
people cannot afford to pay for private practice services. Previously in her career, grants allowed
Barbara to bring neurofeedback to lower income populations. She has observed that lower
income populations respond well to neurofeedback when given the opportunity.

Summary

Barbara’s life changing personal experience with neurofeedback 15 years ago provided
the impetus for its use in her practice. Constantly looking for new neurofeedback modalities,
Barbara is a lifelong learner who wants to “stay on the cutting edge” in order to offer her clients
"the best that’s out there." Neurofeedback and counseling complement each other in that neurofeedback adds flexibility to the brain, forging new neuronal pathways that allow a person to initiate the alternative ways of thinking, feeling, and acting suggested in counseling. It is a “gentler way” to deal with trauma, as its calming effects on the brain allow the trauma survivor to process the trauma as a third party instead of reliving the event. The themes that emerged in the interviews with Barbara are displayed in Table 4.12.
Table 4.12
Themes, Sub-Themes, and Supporting Information

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<thead>
<tr>
<th>THEME</th>
<th>SUB-THEME</th>
<th>SUPPORTING INFORMATION</th>
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<tr>
<td>Practitioner</td>
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<td>3 months NFT vs. 20 years of counseling</td>
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<td>NF personal experience</td>
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<td>NF commitment</td>
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<td>Business environment</td>
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**Participant Themes**

**Introduction**

The previous section, entitled Participant Profiles, included a group profile of all participants as well as individual profiles for each of the 10 research participants in this study. The individual profiles presented a thick description of each participant in addition to the prominent themes that emerged from the process of open coding during the three rounds of data collection. The thick description of each participant provides the background for the comparison of participant themes in this section. This section, entitled Participant Themes, describes the common themes that emerged across participants in the process of axial coding. Prominent themes were selected on the basis of research team agreement and not necessarily on the number of times that these themes appear in the individual profiles. These themes represent the factors and processes that contribute to positive treatment outcomes with trauma survivors.

Research participants were identified using a nomination process and snowball sampling. The first round of data collection consisted of a face to face interview with each participant, with the exception of one participant interviewed via Skype, from September 4 to November 18, 2010. The second round of data collection consisted of follow-up telephone interviews that occurred between November 3 and December 15, 2010. The third round of data collection consisted of an email follow-up between April 21 and May 20, 2011. Interviews were transcribed and analyzed by my research team and me as they were completed. The research team and I met on a regular basis to reach consensus on emerging themes.

As part of the reflective process, I acknowledged my assumptions by drawing a concept map that I shared with my research team before data collection began. Toward the end of the first round of data collection my research team and I began to change the concept map according
to newly identified themes and interactive processes. In accordance with grounded theory tradition, I designed a final concept map at the end of the study that portrays my theory of the action/interaction/emotion processes that emerged from the data (Strauss & Corbin, 2008). The final map presented in the Grounded Theory section of this chapter (Table 4.13), is quite different from my original conceptualization.

Interview Themes

The central research question for this study was “What are the factors and processes that influence treatment outcomes when neurofeedback training is used to treat individuals with trauma symptoms?” The interview questions and format, including the initial face to face interview in the practitioner’s office, were designed to capture these factors and processes in a manner that depicts their fluid, interactive nature.

I originally assumed that various client factors and therapist factors would combine in an interactive therapeutic alliance that would produce a treatment outcome. In addition, I assumed that therapist and client factors would be relatively balanced in proportion. However, as I conducted the initial interviews I began to suspect that much more emanates from the person of the therapist than I had previously imagined. “The magic is not in the box” is a phrase that Marian used to describe the holistic process of effective neurofeedback training that encompasses much more than expert use of technological equipment. I will begin with the practitioner as the first factor in that process.

The practitioner: “The magic is not in the box”: Neurofeedback practitioners interviewed in this study are interesting and unusual people. They have had varied work experiences before settling down in the mental health field (Charles, David, Helen); they have lived overseas (Charles, Julia, Shirley); they began or returned to a university at an age when
most people would not make that decision (Sarah, Charles, Marian); and they continue to be actively engaged in private practice into their 70s (Charles, Marian, David, Shirley). They describe themselves as being “open” to new ideas and experiences, and as frequently thinking “out of the box.”

They initially entered the mental health field because they are people-oriented and relational, but then made the choice to tackle technological challenges that they describe as being “daunting” and “a huge leap” (Sarah), “a steep/huge/enormous learning curve,” (Charles, Julia, Shirley, Barbara) and a “step of faith” (David). They described “sweating blood” (Charles), being “scared to death” (Marian) and extending way “out of my comfort zone” (Shirley) when they brought neurofeedback equipment into their practice. Gaylen mortgaged her house in order to purchase her first neurofeedback set. All were willing to take the “leap,” to undergo a “huge paradigm shift” because what they saw before them was so “dramatic” and “compelling” that they could not “walk away.” They are risk-takers who willingly take on new challenges.

Risk-takers. The risk-taking does not end with bringing neurofeedback equipment into their practices. Practitioners stated that the neurofeedback process can be “scary” for both practitioner and client, as negative effects and abreactions may occur at any point. Gaylen described a client whose emotional state had been improving with neurofeedback but then markedly deteriorated after doing alpha-theta. Looking uncharacteristically “disheveled” at her next appointment, the client revealed that she had stopped caring for her house and her pet, her prized possessions. Julia, John, Shirley, and Barbara warned that trauma survivors can have unexpected abreactions as neurofeedback relaxes them, making them feel more “vulnerable” as they lose their “protective armor,” or as flashbacks of traumatic events suddenly occur. Barbara described the strong inner fears of the therapist in the face of uncertain treatment results:
I have to always stay calm with clients... and if there is a problem to always reassure your client that everything’s going to be fine because there’s that placebo effect that takes place like even if you’re scared to death inside and wondering oh no what did I do and how am I going to fix this? (Barbara, Interview #2, lines 84-88)

Neurofeedback reactions can be unpredictable.

In both interviews Marian emphasized a recent article published on potentially negative reactions to neurofeedback that may be major or minor. Marian routinely expects minor side effects that indicate that neurofeedback results are not merely a placebo effect:

I’m pretty sure this isn’t placebo... a lot of people say this tiny signal can’t be having an effect so it has to be a placebo effect, but I’m convinced it’s not because the most common reaction and you will see this in the consent form... you will have a headache or feel really tired or re-experience the pain at the time of trauma with the first treatment or two... so negative things happen. People don’t say oooh I feel great... if they have ever had a concussion, they are likely to have a headache... because there is a recall of the somatic experience. (Marian, Interview #1, lines 920-926)

Marian expects these typical responses to neurofeedback, but has also witnessed more extreme reactions, such as a woman whose leg muscles began contracting so strongly after five minutes of neurofeedback that she could not walk. Although rare, both minor and major reactions do occur, and Marian says that clinicians must be “unflappable.” Risk-taking occurs from the time that the practitioner decides to attend neurofeedback training sessions to the moment the equipment enters the office and continues all the way through a practitioner’s career.

“Always looking” (Lifelong learners): Lifelong learner does not adequately depict the participants’ motivation to continually augment skills in order to more effectively meet clients’
needs. These expert practitioners seem to possess an inner drive to surpass mere competence in order to be the best that they can be in their unique settings. Those in small towns tend to offer more varied services, while those in larger metropolitan areas are more specialized. In any case, they are always trying to improve.

I think experts are always looking…the people that I think of as the best [emphasis]…are always looking for new approaches…they are talking to colleagues…when they get stuck they are talking…they are finding other people who are at their level of experience or that they trust. (Gaylen, Interview #1, lines 756-759)

As a result of “always looking,” these expert practitioners have accumulated a “big bag of tools” (Sarah) and a “whole array in my armament to help people” (Julia). They are trained in play therapy (Sarah, Charles), EMDR (Julia, John), DBT (Gaylen), psychodrama (John), guided imagery (Charles, Marian, Barbara), and hypnosis (Marian). They have been trained in biofeedback as well as neurofeedback (Julia, Marian, Helen, Shirley, John, Barbara) so that they can get to problems through the autonomic nervous system as well as the central nervous system. They use high frequencies (Gaylen, Julia, Marian, John, Shirley, Barbara), low frequencies (Sarah, Charles, Helen), and a mixture of both (David). They often utilize multiple types of equipment and frequently mention LENS, z scores, Roshi, QEEGs, heart rate variability, and Alpha Stim, among others. Julia owns nearly every type of equipment currently on the market. No matter what skills they already possess and what equipment they currently use, they are continually striving to keep current on the newest methods.

What I really want to do is keep learning and stay on the cutting edge…I don’t want to coast…I want to always be one of the best…I’m a type A personality…If I’m offering something to my clients I want to be able to offer them the best that’s out there…I’m
always a little behind because there’s always a learning curve…and a better way of doing it takes awhile to know the equipment and the training to incorporate that into my practice…but I continue to keep working to go ahead and keep learning.

(Barbara, Interview #1, lines 291-300)

Staying on the “cutting edge” in order to offer clients “the best that’s out there” requires dedication to continuing education in its many forms. Most of the participants cited ongoing training as one of the most important factors for positive client outcomes. Julia stopped counting her continuing education units after she surpassed 1,000 post-doctorate hours. These practitioners hold membership in professional associations and regularly attend national conferences as well as regional and local trainings. They participate in email listserves and consult regularly with colleagues. Their conversations are interspersed with references to seminars, books, and professional journal articles. They keep current with the research. Seven of the ten participants mentioned having had at least one strong mentor, and some mentioned several. Two participants that did not have a strong mentor counted it as a deficit. In addition, most participants have published in professional journals. They demonstrate a research orientation by talking about “grade A research evidence,” various research designs, and by conducting and publishing their own research studies. Julia and Marian mentioned researching their own practices in order to assess their effectiveness. All these activities result in consistent professional growth:

I’m a better clinician than I was a year ago and I’m certainly a heck [emphasis] of a lot better than I was 10 years ago but every year that I am doing this I am better than the year before. (Barbara, Interview #1, lines 508-510)
In addition to investing in themselves, the participants invest in others and in the field as a whole. Seven participants have served on the boards of their professional associations, five mentioned organizing local trainings for other professionals, most regularly present at local and regional trainings, and four have presented at national or international conferences. Julia and David supervise interns in their practices, Marian and Helen conduct scheduled group supervision, and all participants mentioned the importance of making themselves available to colleagues for informal consultation. Through these activities, they contribute to the field and demonstrate a strong professional identity.

**Reflective Experience.** Participants in the study had a range of 14 to 40 years of psychotherapy experience, with 25 years being the median, and a range of 4 years to 21 years of neurofeedback experience, with 15 years being the median. Moreover, they counted these years of experience as being vastly important in client outcomes. When asked how much experience matters, most simply answered “a lot.” Participants described the value of experience in various circumstances. Experience gives “more information to draw from... it just pops right out when you need it” (Shirley, Interview #1, 398). Experience helps practitioners to “recognize phenotypes” (Julia) and to handle abreactions (Gaylen, Julia, Shirley, Barbara). Experience also helps practitioners to keep searching for new protocols because they realize the limits of what they currently know: “The more brains you have worked with... the more things you have had to encounter the more you understand the limits of the protocols that are out there” (Gaylen, Interview #1, 779-780). Although “finding all that in one person is difficult,” having experience and training in multiple areas is “ideal”: “If you can get somebody who is very experienced as a psychotherapist and very experienced in doing neurofeedback... that’s ideal” (Gaylen, Interview #1, 786-787). In addition, practitioner training in trauma and attachment “matters a lot.”
Practitioners were not only experienced in providing neurofeedback services. They were also reflective about that experience, willingly talking about both their successes and failures and what they had learned from both.

**Neurofeedback personal experience:** An important factor that keeps the participants actively engaged in practice is their experience with the neurofeedback process. Six practitioners in this study experienced dramatic physical and emotional changes from neurofeedback training. Others were convinced through seeing rapid changes in clients or family members. Many continue to train themselves on the equipment.

Gaylen describes herself as a “poster child for everything neurofeedback can address.” She had PTSD and a TBI as a result of childhood trauma until neurofeedback training eliminated her seizures, migraine headaches, and all PTSD symptoms, including her life-long startle response. Julia had spent “tens of thousands of dollars” seeking a cure from chronic fatigue syndrome and envisioned founding a “healing center” if she could ever recover. After neurofeedback she started and manages one of the largest clinics in the country. Marian had struggled her entire life with memory and learning problems stemming from a TBI in childhood. After neurofeedback training “it all changed...it changed my life...I couldn’t be doing this [the research] if I didn’t have that treatment.” She says, “Nothing else does this.” After Helen witnessed “profound” mood changes in her son due to neurofeedback training, she also began treatment and was cured of chronic fatigue syndrome. She currently manages a clinic and travels nationally and internationally to train others. David was cured of “30 years of back pain” in a neurofeedback session. Barbara “made more progress in 3 months of neurofeedback than in 20 years of counseling” for anxiety and panic disorder.
**Passion.** Risk-taking, lifelong learning with a growth motivation to better serve clients, combined with their own personal experiences of neurofeedback produces a passion for the field and a vision for its future.

We still had that vision because just like everybody who gets into this field now it’s like oh my God if you thought of all the people you could be helping? Let’s get busy, let’s make this happen in the world. (Helen, Interview #1, lines 260-262)

And these practitioners are making neurofeedback “happen in the world” in creative ways. Sarah has a plan to attract interns to her underserved area. Gaylen has trained mental health professionals to use neurofeedback with abused children in a children’s clinic. Charles carries portable neurofeedback equipment to clients’ homes if they are housebound. Marian recruits veterans for TBI and PTSD studies. Julia specializes in the treatment of migraine headaches. Helen’s practice sponsored a research study at a residential treatment facility for drug and alcohol addicted individuals. David treats military veterans free of charge, saying “Money doesn’t stand in the way around here.” Several mentioned doing either pro bono work or some work on a sliding scale. Helen stated, “It’s not work; it’s a passion.”

Their passion extends to the field as a whole. Many participants expressed concern about unlicensed and unqualified people “overcooking people’s brains” as they “hook ‘em and cook ‘em.” Many mentioned the need for more regulation in the form of credentialing and training standards. Julia told a specific story of a pending law suit, warning “there are a lot of quacks out there.” Incidents in which unqualified individuals provide neurofeedback services give the field a bad reputation at a time when legitimate practitioners are working hard to earn neurofeedback its place alongside mainstream treatments and to discard its reputation in some circles as “high tech snake oil.”
Trauma understanding. Participants agreed that trauma is a common experience that takes many forms. It is an underlying issue with 25% to 95% of their clients, with 65% being the median. They noted that “it’s unusual to find somebody who hasn’t had some kind of trauma” (Marian, Interview #1, 1246), and that the older people get, the more likely they are to have had “some trauma somewhere along the way” (Shirley, Interview #1, 16). However, clients may not realize that the underlying source of their symptoms is trauma. David noted that “half or less” of his clients come to therapy for the actual underlying problem, “so we have to figure it out.” Barbara observed that “many are traumatized and don’t know it.”

Participants’ trauma understanding helped them in planning appropriate treatment. Most emphasized going slowly with trauma survivors due to potential abreactions. Although neurofeedback is generally successful in alleviating trauma symptoms, several practitioners indicated that trauma survivors will likely need to continue neurofeedback longer than those with other issues. In addition, all practitioners suggested that trauma survivors need counseling in addition to neurofeedback.

Some practitioners are more experienced with complex or developmental trauma, while others are more familiar with PTSD. Marian utilizes a wide definition of trauma that includes traumatic brain injury.

Complex trauma. Gaylen emphasized the fact that developmental trauma disorder, a potentially new diagnosis in the next DSM, is a “whole body diagnosis” descriptive of the fact that early childhood trauma causes disruptions in “every system of cognitive, learning, behavioral, emotional, and physiological [domains].” When a client has experienced early childhood trauma, Gaylen focuses on “always to be quieting fear” that can take many somatic as
well as emotional and behavioral forms. One of the somatic forms may be fibromyalgia, which some believe may be associated with sexual abuse (Marian, Interview #1, 1143).

Julia describes complex trauma as having been “marinated in fear.” She is keenly aware of trauma indicators in clients so that she can avoid abreactions. Some clients are “therapy virgins” who are unaware of previous trauma, but Julia recognizes its existence by their “body clench” as if they have been “holding onto something” for a long time. If a client has many somatic complaints, including pain such as migraine headaches and chronic upsets such as irritable bowel syndrome, or if they seem “paralyzed in life” emotionally, then Julia suspects trauma as an underlying factor.

Helen describes complex trauma as affecting the core sense of self. People that have “no place of safety” in themselves feel overwhelmed and constantly threatened. Addictions and other self-destructive behaviors may result from the feeling of low self-worth that often accompanies trauma.

Sarah is aware that underlying trauma issues in children are often misdiagnosed as AD/HD or some other disorder. Her trauma understanding is rooted in neuroscience knowledge, as she described the manner in which childhood trauma may alter brain functioning, resulting in inadequate problem solving skills.

Coping deficit...kid after kid after kid who comes in that is where the issue is.

People think they have...AD/HD or whatever...well if you are living in a situation where you are in survival mode and you are not taught to cope and you are not taught to deal with your emotions or express your emotions etcetera you are going to have this coping deficit. It gets labeled AD/HD, it gets labeled all kinds of things. The prefrontal lobe is not going to develop in trauma situations. If you are just surviving your executive
function isn’t going to develop. [Sarah, Interview#1, lines 451-457]

Complex trauma can take many forms, and experienced practitioners are on the lookout for it, as clients are often unaware of the connection between previous trauma and their current emotional and somatic symptoms.

**Posttraumatic stress disorder.** Having been a military veteran himself, David treats many veterans in his practice. He stated that half the time or more clients do not come in for the actual presenting problem, so he and his staff “have to figure out” the real issue. Often that issue is trauma. Symptoms of PTSD include the emotional disregulation inherent in all forms of trauma, including heightened anxiety and nightmares.

**Traumatic brain injury.** Marian’s definition of trauma includes all degrees of traumatic brain injury, including Cesarean sections and other “traumas that aren’t usually thought of as traumas but they’re a trauma for the brain” (Interview #1, 1006-1012). She assesses carefully for any type of head injury because even mild head injuries can dramatically alter emotional responses and thinking processes. The presence of head injuries is actually a good indication that neurofeedback may work well, whereas other therapies will likely have limited effectiveness.

A major factor is to find out about old head injuries. If they have been there then you have got a much better chance of neurofeedback working… I think with any [emphasis] kind. Everything is going to be limited, hand warming probably wouldn’t do a lot either or autonomic biofeedback probably wouldn’t do much…because you’ve got to change something about the way the brain is firing. (Marian, Interview #1, 979-986)

Assessing for head trauma gives practitioners an indication of the source of emotional and cognitive difficulties, as well as in indication of which tool in the “arsenal” will work most effectively.
Neuroscience knowledge. Participants discussed neurofeedback treatment protocols for trauma symptoms in terms of brain anatomy and neuroscience knowledge. Sarah discussed the inability of the prefrontal cortex to develop normally in a child exposed to ongoing trauma. Gaylen described how “the brain becomes mind,” meaning that personality is formed through the underlying firing of brain neurons. She does not utilize cathartic therapies due to the maxim “what fires together wires together.” She believes that discussing traumatic events before the brain is calmed down only serves to strengthen the neuronal pathways in an anxious, fear-based neurological system. Julia noted that a “classic PTSD phenotype” is depicted on SPECT scans as “the temporal lobes become overactive and the frontal lobe shuts down” (Interview #1, 917). Helen connects childhood trauma with the need for right brain neurofeedback training. Marian described the “neurochemistry of trauma” as the brain being “stuck,” being “frozen in a protective state” from “extreme fear.”

Traumatic experience may result in the brain becoming “stuck” from fear, but neurofeedback can help it get unstuck by modifying brain firing patterns. Neuroplasticity, defined as “the brain’s ability to change,” is a practitioner’s “biggest ally” in neurofeedback treatment.

One thing I learned when I was working with hospice and cancer patients who were dying… is that there is something in every cell that keeps trying to fix [emphasis] itself and the brain is just sitting there waiting for us to find the right key…neuroplasticity is the thing. (Marian, Interview #1, 830-846)

Important factors in successful treatment involve the neuroplasticity of the client’s brain coupled with the practitioner’s ability to find “the right key” based on neuroscience knowledge.
Therapeutic process. The therapeutic process begins with the office atmosphere, continues as the therapeutic alliance forms, and builds throughout treatment as the therapist gathers and responds to client feedback during every session. The actual neurofeedback is a major piece, but in reality only one piece of this holistic process.

Atmosphere. The therapeutic process begins the moment a client enters the door. Barbara deliberately sets up a “friendly kind of atmosphere.” David spoke of the importance of a “loving atmosphere,” a “sense of love and God’s presence” that “sets up the possibility for healing.” Sarah’s office is located in a renovated church with stained glass windows, and she emphasized the décor and a family business atmosphere as setting up a “safe, welcoming” environment that is a “huge factor” in therapeutic outcomes. Although Julia did not mention the office atmosphere as contributing to client outcomes, she created an environment that inspired hope. The walls of Julia’s waiting room are decorated with enlarged newspaper articles of neurofeedback success stories, and a notebook filled with research articles and more success stories sits prominently on a table in the center of the room. I found myself wanting to be a client as I waited and read these materials, and I wondered what degree of hope and confidence might be instilled in clients even before the actual neurofeedback process begins.

Therapeutic alliance: The office atmosphere provides the prelude to the formation of the therapeutic alliance, and all 10 participants described various aspects of this important factor. The therapeutic alliance grows over time and is particularly fragile with trauma survivors (Gaylen). David stated that the most important lesson that he has learned in his 40 years of counseling experience is the centrality of empathy, an ability to “hear” clients, and to “feel a sense of what they feel.” The practitioner may be like a “coach” or a “support person” (Helen). “Trust” within a “nurturing relationship” is important (Barbara). A caring relationship is crucial
because “anecdotally we learned that people are not used to being treated with care” (Sarah).

“Over time” John realized “that all the skills and what you learned in therapy is still useful.” Julia observed that “getting to know your clients increases outcomes.” Having many military clients, Marian sat through the movie *Hurt Locker* even when she wanted to walk out because she thought, “These guys live [emphasis] this so surely I can watch a movie.” It is crucial to “be there” as a strong, stable, and calm support for trauma survivors:

> When you’re dealing with people with trauma you’re talking with people with psychological issues and sometimes the neurofeedback brings that up to the surface and they need to believe that you’re going to be there and they’re going to get through it and show strength in yourself that you will be there for them (Barbara, #2, 96-100)

Other practitioners also emphasized the importance of “being there” as a stable presence (Gaylen, Marian, Shirley). Even in the midst of complicated technological equipment, David summed up the importance of the relationship in the neurofeedback process by saying, “I am not a technician... I am still a therapist” [#1, 472].

**Business practices.** Although I never asked about the business aspects of private practice, all ten participants discussed various aspects of this theme during the interviews. Business practices constitute the foundation on which practitioners build the therapeutic process with clients. Marian observed that one prominent organization went out of business due to poor decisions and as a result no longer exists to train people. Both Sarah and Barbara discussed using a technician and careful scheduling in order to “stay afloat” in their private practices. Shirley shared her knowledge of the range of equipment prices and which companies more often had sales. Julia’s marketing expertise shows in her ability to attract attention from the press, and her managerial ability shows in a well-organized office. Helen markets her practice by offering a
free first appointment in which she completes an assessment and familiarizes people with the neurofeedback process. Without a savvy business sense, practitioners could not be helping anyone.

**Neurofeedback process: “We’re not fixing brain waves”:** The neurofeedback process is a major piece of the therapeutic process. Participants were clear that neurofeedback is not simply “fixing brain waves” (Helen). Instead, it sets in motion the “transformational process” of personality that may be a “big trip” as the practitioner works at the intersection of the brain and the mind. As neurofeedback modifies brain wave patterns, changes in the mind occur that affect cognition, emotion, behavior, and relationships.

The single most important message...the most important lesson that I’ve gotten has been that the core of all of our psychological problems rest in the firing of the brain in some way...That all mental processes sit on top of this and that we have access to it...In neurofeedback you see an evolution of....the mind as the brain regulates itself.

(Gaylen, Interview #2, 17-27)

This “transformational process” starts with a thorough assessment and screening and continues with protocols determined through constant client feedback. Since this process may result in becoming “a new way in the world,” most participants recommended that counseling be included in the therapeutic process.

**Thorough assessment: “detective agency,” “outside the box”:** The neurofeedback process begins with an assessment that is thorough and holistic. Some practitioners routinely use a QEEG, while others are guided solely by presenting symptoms. Marian likened the assessment to being a “detective agency.” Both Sarah and Marian said, “I hate diagnoses” because labeling often discourages looking “outside the box” for the root problem. Marian carefully assesses for
head injuries, the root of many psychological and emotional problems, and assesses for trauma by asking, “What’s the worst thing that has ever happened to you?”

The assessment is holistic. Eight of the ten participants mentioned assessing for nutrition and allergies. Julia has a nutritionist on staff and cited wheat and dairy products as being common offenders. Marian also looks for infections such as Lyme disease and other parasitic infections. Since Marian believes that neurofeedback is ineffective in their presence, she tells clients to get these infections cleared up before beginning neurofeedback training. In addition, clients are sometimes told to discontinue ingesting aspartame, as it is a neurological toxin.

**Screening: “Don’t waste your money with me!”** Either in conjunction with the assessment or separately, five participants mentioned utilizing some type of screening process. Julia is very straightforward with clients in saying, “Don’t waste your money with me!” when a QEEG shows a computer game addiction that will interfere with treatment. Marian screens out clients with chronic infections such as Lyme disease. Shirley and David screen out clients taking a benzodiazepine medication because they “take over the brain” and interfere with neurofeedback. Barbara discourages clients who are on a “cocktail of meds” from starting neurofeedback because medication adjustments may become too complicated. Through a process of “good, careful informed consent,” Julia and Shirley stress to clients that neurofeedback is “not an instant fix,” and the commitment will require both time and money.

Sarah, Gaylen, and David process emotional aspects at the beginning of neurofeedback treatment. In order to assess client motivation, David asks clients, “What do you have to give up?” in order to get better. Gaylen asks, “You can go through a wide range of changes. Are you ready for that?” Both Sarah and Gaylen highlighted the importance of processing fear, since
“health is scary sometimes.” Most practitioners have some sort of client screening process that involves both physical and emotional factors.

Protocol: “Cast a wide net,” “Find the right key,” “Stabilize”: Participants agreed that with trauma survivors, practitioners must move slowly and cautiously to “calm down” (David) and “stabilize” (Julia). With neurofeedback, this generally involves working on the right side of the brain (Sarah, Charles, Helen). Sometimes, however, practitioners use biofeedback first to decrease anxiety through the autonomic nervous system and to give the client a “sense of control” (Barbara). Julia talked of “casting a wide net” and having “a whole array in my armament to help people.” Participants often utilize various machines and multiple techniques to conquer the problem because “Good therapists have always been very attuned to what people bring, and so they wouldn’t necessarily be wedded to one approach” (Marian, Interview #1, 876). Practitioners must “find the right key” in order to “talk to” the brain instead of talking “at” the brain (Marian). Six of the participants use the alpha-theta protocol, while four do not.

Constant feedback: “the brain and the mind”: Practitioners choose protocols as they follow client symptoms: “Start with the symptom or the behavior that is most obvious, that’s going to be the brain’s way of talking to you, the outsider” (Marian, #1, 866-867). Practitioners subsequently alter protocols in response to specific client feedback every session regarding changes from the previous session: “We collect data at every single session, hard data” (Marian, #1, 764). Helen describes this process as “a team effort” in which she tells clients, “You and I are going to have to work together here...I kind of know about neurofeedback but do you know about you? So you’ve got to talk to me about what’s going on” (Helen, Interview #1, 436-438). Barbara highlighted the importance of practitioner flexibility in responding to this ongoing data:

Be open-minded and not get stuck on a particular type of protocol or treatment...through
the years I’ve seen it over and over and over again…there are these absolutes that people come up with… that you never do this you never to that and over and over again those absolutes have shown to be false…so keep an open mind to different approaches.

(Barbara, Interview #2, 17-20)

When receiving client feedback, the practitioner is having “two different conversations” with both “the brain and the mind.” When these two contradict, the practitioner follows what the client’s brain is saying (Gaylen). Finally, all 10 participants agreed that effective neurofeedback treatment involves practitioner art or intuition as well as science. “Intuitive sensing” (Charles) and a “sense of timing” (Sarah) help the practitioner to “apply the model in a sensitive way for the individual” (Helen, #2, 78).

**Negative effects:** Although I never specifically asked about negative effects, 8 of the 10 participants mentioned the “scary” nature of unexpected or negative reactions ranging from headaches to abreactions. Although potentially “scary” for both the client and the practitioner, negative reactions may actually indicate that neurofeedback results are not merely “placebo effect,” as some detractors claim. In fact, negative effects may not actually be negative at all since they demonstrate that neurofeedback has the power to do something.

Even when we move people in the wrong direction…even when we mess up their sleep or give them a headache or something by not training optimally…that gets people’s attention…like oh you really did something because the biggest fear is really that this is a scam you’re wasting my time and when we do something strong even if it’s the wrong thing it’s like ok this actually works because after all what is people’s experience with medicines? They just as often mess you up as help you…this is strong stuff and if I get the right [emphasis] strong stuff this may help me. (Helen, Interview #1, 1186-1196)
Although negative effects may be “scary,” they can result in increasing hope in the process.

**Consultation and referral sources: “I don’t know it all!”** All participants emphasized the importance of consulting with colleagues. The statement, “I don’t know it all!” spoken by a practitioner with over 31 years of mental health experience and over 15 years of neurofeedback experience, exemplifies the degree of consultation in which the participants engage. In addition, they have a wide range of referral sources for clients, including neurologists, nutritionists, psychotherapists, psychiatrists, and cranial psychotherapists.

**Counseling: “Who am I now?”** Counseling and neurofeedback complement each other. Counseling trauma survivors without neurofeedback is “like doing surgery without anesthesia” (David, Barbara). Since that process is “terribly painful,” both Gaylen and Barbara stated that they would no longer counsel trauma survivors without neurofeedback; in fact, “psychotherapy is lame” without neurofeedback as a calming component that reorganizes the brain (Gaylen). Gaylen emphasized that, particularly for complex trauma survivors, the counseling process can be hindered by a repeating cycle of strong transference reactions of fear, rage, and shame, accompanied by countertransference reactions on the part of the therapist. Neurofeedback provides the “transference cure” by “quieting fear” in the deeper limbic system so that the client can talk about the trauma without once again disregulating the neurological system (Gaylen).

Five participants emphasized that neurofeedback prepares clients for counseling. It seems to affect the “chaotic places” and the “rigid places” in the brain, helping the client out of being “stuck” in rigid patterns of thinking, feeling, and behaving (Gaylen). It creates more flexible thinking patterns by forging new neuronal brain connections, “connecting areas that weren’t connected before” (Barbara). These new neuronal pathways get the brain “ready to learn,” to consider new options presented within the counseling relationship: “I can tell
sometimes that they’re doing well with the neurofeedback because they actually consider some things I say…they can see options that they hadn’t been able to see before” (Barbara).

Just as neurofeedback is necessary to calm the trauma survivor’s anxious neurological system, so counseling assists in processing the changes that neurofeedback may effect in every domain. Since “whole identities may be built around affect,” as affect symptoms drop away, the question of identity comes to the forefront. Clients may begin to ask themselves, “Who am I? If I am not this terrified raging shame-based person, who am I?” (Gaylen). Neurofeedback is not just “changing brain waves” and curing symptoms. Neurofeedback sets in motion a “transformational process” of the personality.

“Who am I now? What am I going to do with my life? I mean just taking symptoms away…it isn’t that…it’s like any kind of therapy…it’s a transformational process…they have to become a new way in the world…not just shed symptoms…so it’s a big trip” (Helen, Interview #1, 1221-1225)

In neuroscience terms, this “big trip” starts with neurofeedback calming the brain and making it more flexible. Processing within the counseling relationship helps to move the traumatic experience from the more emotional right brain to the more linear, rational left brain, helping the person to be “done with” the trauma. Neurofeedback works together with counseling to give the client a past instead of constantly reliving traumatic experience in the present (Helen). As a general rule, “People with trauma ultimately need more counseling” (Barbara). Moreover, this complementary relationship between neurofeedback and counseling works in a cyclical fashion.

As you are doing neurofeedback and you are re-regulating the brain and issues come up that they are willing and able to talk about with some insight…and do more
neurofeedback and other issues come up say from an earlier period or a different period...it’s almost like peeling an onion. (Shirley, Interview #2, 92-96]

Neurofeedback and counseling complement each other as the client goes back and forth between the calming emotion regulation that neurofeedback provides and the talking in the counseling relationship that moves traumatic experience from the right brain to the left brain to the client’s past. Counseling assists the client to process the transformation in identity as affect symptoms drop away.

Client factors. Although clients try neurofeedback for a myriad of reasons, they do have some things in common. They are generally “miserable” (Marian), have “tried everything else” (Barbara), and then try neurofeedback as a “last resort” (Helen) because “if there were an easy answer, people would have found it already” (Helen). Barbara estimated that 75% of clients have tried many other things first and the other 25% want a “non-invasive” alternative to medication. The fact that clients have tried other things, including psychotherapy, before neurofeedback usually means that their problems tend to be more severe, such as “severe attachment disorders” or “significant brain injury” (Barbara).

Various client internal factors contribute to treatment outcomes. Six participants mentioned client motivation, described by Sarah as “You gotta have a want to,” as being foundational. Even if motivated at the beginning of treatment, clients need “fortitude” to stay with the process sometimes over significant periods of time (Shirley). “Fortitude” involves not only personal resolve, but time and financial resources. An active client who is engaged in the process and able to give the practitioner consistent feedback on changes, either positive or negative, may experience more positive outcomes (Helen). An attitude of “show up and be
fixed” doesn’t work well (Helen). Moreover, clients must be willing to process and overcome fear of health (Sarah, Gaylen, David).

Physical factors such as chronic infections or unidentified allergies interfere with treatment (Gaylen, Julia, Marian, John). Thorough assessment for these factors is important because “therein lies the 1/3 that do not get better” (John). Two participants (David, Shirley) mentioned that medications such as the benzodiazepenes can prevent neurofeedback from having lasting effects. Anything that affects the brain, including poor nutrition, lack of water, or toxins such as aspartame or mold, may also potentially hinder the neurofeedback process (Gaylen).

A psychologically toxic environment will also interfere with treatment outcomes, and four participants mentioned the family system as a salient factor. If a client is a “designated patient” that is “holding the family together” (Barbara) or if the family does not want to “lose their scapegoat” (David), then the chances of positive outcomes are diminished. If a client comes from an unstable home life in which they are being retraumatized through various types of abuse, neurofeedback effects will likely be undone (Shirley, Barbara). On the other hand, a relatively stable family supportive of the client and engaged in the process provides a more conducive environment for successful treatment that lasts.

Finally, practitioners were specifically asked to what degree multicultural factors might influence treatment outcomes. All 10 participants maintained that racial and ethnic factors have minimal impact on the neurofeedback process. Since neurofeedback is not as “culturally loaded” as traditional talk therapy (John), it tends to cross racial and ethnic boundaries well with one possible exception. Since a practitioner and client must communicate accurately and “read each other well,” “anything that interferes with communication is going to interfere with success” (Helen). Four participants specifically noted that “age is not a factor” (Sarah), as they have
successfully treated clients ranging from 3 months to 96 years. Although more women than men come for neurofeedback, both respond well to the process. Julia stated that although gender is not a factor, personality type is. She noted that the Myers-Briggs ISTJ (Introvert/Sensing/Thinking/Judging) personality type tends to overthink the process and therefore frequently struggles in allowing the brain to engage freely with the equipment. The one multicultural factor that does have a negative impact on the process is socioeconomic status. Clients generally need sufficient financial resources to enter the neurofeedback process initially and to stay engaged in the process over time. In addition, more highly educated clients tend to be more open to neurofeedback treatment.

**External factors.** External factors include the neurofeedback field as a whole, the medical profession, and insurance practices.

**Neurofeedback field.** Participants described the neurofeedback field as being “cutting edge,” “growing exponentially,” “up and coming,” and having “endless possibilities.” They were enthusiastic about research published in professional journals as well as recent publicity on National Public Radio broadcasts, the *New York Times*, and other public forums. Neurofeedback seems like a treatment whose “time has come.”

> Like the plant growing roots for years and we’re just starting to break the surface and it really really feels like neurofeedback’s time has come for a number of reasons…people are ready to adopt it and it’s not us not just our company but the field in general is really starting to take off. (Helen, Interview #2, 200-204)

As the general public hears about neurofeedback through various media venues and seeks alternative treatments to medication, acceptance of neurofeedback may be achieved in the near future.
NPR [National Public Radio] in the morning had a piece on neurofeedback that was essentially the same as the New York Times article a couple weeks before and several people who have been calling this week have mentioned that article and I think there’s a growing awareness….it almost feels like we’ve reached a critical mass that enough people know about this now so that more people are going to try it because of the problems with medication especially where children are concerned….and a real desire not to go that route unless it’s absolutely the only thing left.

(Marian, Interview #2, 145-151)

This positive publicity may influence treatment outcomes in that it may draw a larger number of people to seek treatment and potentially increases the confidence that those people place in treatment outcomes. It may also lead to more acceptance by the medical profession. Perhaps in the future medication may become the “last resort” instead of neurofeedback.

All publicity is not positive, however. Eight of the ten participants noted that unexpected negative effects may occur even with a well-trained practitioner. These negative effects may range from minor and temporary reactions such as headaches to more major reactions such as a woman who could not walk after several minutes of neurofeedback (Marian). Moreover, neurofeedback is a relatively new field whose professional identity is unclear. Therefore, a credentialing process has not been standardized and ethical standards have not been codified. As a result there are “a lot of quacks out there” (Julia). Three participants (Julia, John, Barbara) expressed concern over harm done to clients by practitioners who are not properly trained or supervised. John spoke of “hook ‘em and cook ‘em” practices. Julia described a law suit against an untrained practitioner who harmed a client’s brain functioning. Barbara warned, “People who don’t know what they’re doing mess people’s brains up” [#2, 317-318]. Harmful and unethical
practices harm clients and bring bad publicity to the field at a time that it is struggling to earn its place in the mainstream. Both good and bad publicity potentially have an impact on client confidence as well as on medical field acceptance.

**Medical field.** The medical field was also seen as having a positive and negative impact on neurofeedback outcomes. On the positive side, six participants observed that psychiatrists and others from the medical profession are beginning to attend trainings, refer clients, and coordinate treatment with neurofeedback providers. Some medical professionals are dropping their skepticism and moving to a more open-minded attitude that says, “Why not?” (Marian). These actions may give clients more confidence in neurofeedback efficacy instead of considering it as “fringe” and “experimental.” There are indications that neurofeedback may be reaching the “40 year rule” (Marian) of medical professional acceptance, and increased acceptance may translate into more clients overall and more client confidence in the neurofeedback process.

On the other hand, the medical field perpetuates the overall “culture of medication” that encourages people to “take a pill and be fixed” (Sarah, Charles). Gaylen viewed the emphasis on pharmacaceutical interventions as being driven by a profit incentive. Clients encouraged in this mentality are less likely to invest the time and finances necessary for successful treatment (Sarah, Charles). Those who do seek neurofeedback are sometimes discouraged by physicians who tell them that they are “wasting their money” on a “ridiculous” treatment that “won’t do anything” (Marian). Some neurofeedback clients resist physician negativity, some change physicians, but others drop out of treatment.

**Insurance policies.** Closely related to the medical field are insurance policies that limit reimbursement to mainstream therapies. Four participants mentioned the impact of insurance policies on treatment. John noted that “insurance companies are in bed with the physicians.” If
insurance policies prohibit reimbursement for neurofeedback services, then clients who do not have sufficient financial means to initiate or continue the process may be excluded from its potentially positive effects.

**Interviewer reflection**

At the end of our second interview, one participant mentioned that she had been unable to attend the most recent regional biofeedback conference; however, colleagues told her that I had been there. I knew that the participants were affecting me in profound ways. I now wondered how I might be having an impact on the participants.

**Summary**

This section contained the prominent themes that emerged from the three rounds of data collection for this study. These themes represent the factors and processes that influence neurofeedback treatment outcomes with trauma survivors. Factors and processes are divided into the two overarching categories of internal and external. Internal factors and processes include the practitioner with trauma understanding and neuroscience knowledge; the therapeutic process includes the neurofeedback process; and client factors. External factors include the neurofeedback field, the medical field, and insurance policies.

**Grounded Theory**

The first section of this chapter, entitled Participant Profiles, included a thick description of each participant along with the prominent themes that emerged from the three rounds of data collection. In the second section, entitled Participant Themes, the prominent themes that emerged across participants were described. These themes compose the factors and processes that contribute to treatment outcomes when neurofeedback is used with trauma survivors. This third section, entitled Grounded Theory, describes a potential theory to explain how these factors and processes interact to influence treatment outcomes. This section provides a summary of the
answer to the central research question and the six research subquestions that comprised the focus of this research.

Central Research Question

The central research question for this study was, “What are the factors and processes that influence treatment outcomes when neurofeedback training is used to treat individuals with trauma symptoms?”

A factor can be defined as “an element or cause that contributes to a result; a component, element, ingredient” (www.freedictionary.com/factor). In grounded theory research a process is defined as “ongoing action/interaction/emotion taken in response to situations or problems often with the purpose of reaching a goal or handling a problem” (Corbin & Strauss, 2008, p. 96). The following section provides a narrative explanation of the potential theory that emerged from the interviews with ten neurofeedback practitioners nominated as experts in treating trauma survivors.

The process of successful neurofeedback treatment with trauma survivors begins with the neurofeedback practitioner. Successful practitioners tend to be individuals who are open to new experiences and new paradigms. They are willing to take risks and are “always looking” for better treatment options in order to stay on the “cutting edge” and give their clients “the best that’s out there.” They stay current with research, are active in professional organizations, regularly attend continuing education events, and constantly seek to improve. Through training and experience, successful practitioners have an understanding of trauma in all its forms, are cognizant of its prevalence, and have learned to recognize it in clients. In addition, they have a foundational knowledge of neuroscience that provides the theoretical underpinnings to their neurofeedback treatment protocols. Whether they offer neurofeedback only or both
neurofeedback and counseling, they have a "big bag of tools" that they have gained through many years of experience and reflective practice.

In addition, successful practitioners have a passion for the field rooted in their own experience of neurofeedback efficacy, whether that experience has come through personal physical or emotional healing, through witnessing dramatic improvement in clients, or through a combination of both. Their enthusiasm for and confidence in the neurofeedback process is evident to those who enter their offices.

Clients who enter the therapeutic process are generally "miserable," have "tried everything else," and have come to neurofeedback as a "last resort." They may also be seeking an alternative to medication because they are concerned about its side effects, especially for children. Clients enter the therapeutic process the moment they enter the practitioner's office, which the practitioner has arranged to instill a sense of safety in the therapeutic process and confidence and hope in positive neurofeedback outcomes. The practitioner utilizes all the therapeutic skills crucial to forming the therapeutic alliance, including empathy and trust building in a "nurturing relationship." Therapeutic skills also include stability and "being there" for clients. The office atmosphere, along with therapist expertise and confidence in the process, set the stage for the actual neurofeedback process to begin.

The neurofeedback process begins with a thorough assessment that looks "out of the box" beyond conventional diagnoses to root problems. Marian emphasized the importance of assessing for unrecognized head injuries and chronic infections. The assessment is holistic and may include nutritional counsel and referrals for food sensitivity and allergy testing, if necessary (Julia).
After the assessment, the practitioner screens out clients for whom neurofeedback may not work well. Those with chronic infections must get the infections cleared up before starting neurofeedback (Marian). Those taking benzodiazepine medications must consult with their physician about changing (David, Shirley). Those with a computer game addiction must limit their time with computer games before starting neurofeedback (Julia). This screening serves several purposes. First, the screening gets clients to the appropriate help so that if they return for neurofeedback their chances for recovery are greater. Secondly, in screening out clients for whom neurofeedback is unlikely to be successful, practitioners increase their treatment success rate. The more clients who successfully complete treatment, the more confident practitioners feel about neurofeedback efficacy, and the more confidence and hope they convey to the next incoming clients. In addition, their reputation as successful practitioners grows in their communities, giving them both beneficial word of mouth referrals in addition to possible positive media coverage.

After the screening process, practitioners set the neurofeedback protocol according to the client’s most prominent symptoms. In order to track treatment effectiveness for those symptoms, they make a list of client symptoms. In order to more accurately pinpoint symptoms, they may ask a client, “How will you know that you are getting better?” Practitioners then collect specific feedback on symptoms at each session and adjust the treatment protocol accordingly. Even negative treatment effects may actually be positive, as they reinforce to the client that neurofeedback can produce results. The ongoing interplay between client feedback and the practitioner’s response each session continually strengthens the therapeutic alliance.

Throughout the therapeutic process practitioners consult with other colleagues when “stuck” or simply to inquire about newer and potentially more effective protocols. They also
refer clients to other professionals when appropriate. If practitioners have an integrated practice they continue to counsel the client. If they offer only neurofeedback services, they encourage clients to seek counseling in order to process the changes occurring through neurofeedback. If they realize that the family system may compromise neurofeedback outcomes, they recommend family counseling. They continue to monitor client motivation and process fear of change with the client.

In addition, practitioners are realistically aware of neurofeedback limitations. They realize that, depending on the severity and nature of the symptoms, neurofeedback may not offer a complete cure. They are also aware that clients may quit the process prematurely. Practitioners are reflective about what they might have done differently, but they do not become discouraged. Despite disappointments, they stay confident in the process, thereby encouraging clients to stay hopeful.

Finally, practitioners who maintain a successful therapy practice are also astute in their business practices in order to “stay afloat.” These business practices interact with clients whose limiting factor may be finances. In response to a client’s financial deficit, practitioners may sometimes accept a fee on a sliding scale or work pro bono.

The external factors of the neurofeedback field, medical field, and insurance policies also interact with the therapeutic process. Positive research outcomes in professional journals provide new methods to practitioners. Positive media coverage encourages more clients to seek neurofeedback. As practitioners utilize new methods, treatment outcomes improve, resulting in increased positive word of mouth and media publicity, as well as positive research outcomes. On the other hand, unqualified people using questionable techniques may diminish
neurofeedback credibility the mind of the public and other professionals, so that clients are
discouraged from seeking or continuing with treatment.

In like manner, the medical profession interacts with the therapeutic process. Physicians
may discourage clients from either seeking or continuing with neurofeedback, thereby either
lessening the initial number of clients or influencing existing clients to terminate the process
prematurely. If clients continue with neurofeedback and report positive results to their
physicians, the physicians may begin to reconsider their stance. On the other hand, physicians
who believe in the potential efficacy of neurofeedback may refer clients to practitioners and may
cooperate in adjusting medications. As physicians witness positive treatment effects, their
confidence may be reinforced, and they may continue to refer more clients. In addition, the
overall “culture of medication” may discourage clients from undertaking the neurofeedback
process that takes an undetermined number of sessions; however, knowledge of negative
medication side effects may influence the public to consider neurofeedback.

Closely related to the medical profession are insurance policies. Lack of insurance
reimbursement may limit the number of clients who seek neurofeedback services. However, as
more research studies are indicating that neurofeedback may be an effective treatment for many
problems, insurance companies may change their policies to include neurofeedback among
reimbursable treatments.
Research Subquestion 1

Research subquestion 1 states, "What are common trauma symptoms encountered by neurofeedback providers?"

Neurofeedback practitioners were aware of a wide range of trauma related symptoms. Symptoms of PTSD included flashbacks, sleep problems, nightmares, anger outbursts, relationship problems, and general hyperarousal.

Symptoms of complex or developmental trauma were more pervasive across functioning, including somatic, cognitive, emotional, and relational problems. Somatic problems may include fibromyalgia, chronic fatigue syndrome, headaches or migraines, intestinal problems, stomach problems, obesity, and chemical sensitivity. One practitioner described recognizing somatic symptoms as a "body clench," as if the client had been "holding onto something for a long time."

Cognitive problems may include learning difficulties, dissociation, and hallucinations.

Emotional problems may include underlying feelings of fear, rage, and shame; high levels of reactivity; "tensional problems;" panic; eating disorders; emotional regulation problems; cutting; self-destructive behaviors of all kinds, including addictions; suicidal ideation; low self-esteem; and feeling "easily overwhelmed." Depression and anxiety as indications of inadequate affect regulation may be signs of underlying trauma. Many of these symptoms are associated with Borderline Personality Disorder, a diagnosis with trauma-based roots.

Participants also highlighted the importance of including head injuries in the wide category of trauma. Although head trauma is not generally included in the category of traumatic experience, "it's a trauma for the brain." Head traumas may be linked to a wide range of cognitive and emotional problems.
Research Subquestion 2

Research subquestion 2 states, “What outcomes have neurofeedback providers observed when treating individuals with trauma symptoms?”

Participants agreed that trauma survivors generally respond well to neurofeedback in that neurofeedback often resolves trauma symptoms more quickly and much less painfully than psychotherapy. Many agreed that “it is so exciting to see the rapid change that you can get.”

Although all agreed that neurofeedback usually “moves along” symptoms, it may not completely resolve all symptoms in all cases. For example, one participant gave an example of a client with Dissociative Disorder who integrated enough personalities that she could function effectively, although she did not integrate all personalities. The same is true with developmental traumas such as severe Reactive Attachment Disorder (RAD). Although treatment will probably improve functioning, it may not resolve every symptom and treatment will probably require more time than other traumas.

At the other end of the spectrum, there are times when neurofeedback may not work at all. One participant estimated that neurofeedback is ineffective with approximately 5% of clients, and another highlighted the “rule of thirds,” meaning that neurofeedback may be highly effective with 1/3 of clients, ineffective with 1/3, and somewhat effective with another 1/3. Since clients generally try neurofeedback as a “last resort,” often medications and other treatments have also failed.
Research Subquestion 3

Research subquestion 3 states, “What is the process of neurofeedback training when treating individuals with trauma symptoms?”

The neurofeedback process begins with a thorough assessment followed by screening out clients for whom neurofeedback will likely be ineffective. The therapeutic alliance and therapy skills, including empathy are important throughout the process as the therapist assesses motivation and seeks to “always be quieting fear” that can take many forms. In addition, a strong therapeutic alliance serves as a safety net in the face of potential abreactions.

Neurofeedback treatment begins by identifying the most prevalent symptoms, which are “the brain’s way of talking” to the practitioner. With trauma survivors the practitioner usually begins by calming the right brain. The temporal, occipital, and parietal lobes receive attention in this process. After hyperarousal symptoms are calmed, the practitioner may also use Alpha-Theta deep state training. Some practitioners also utilize thermal hand warming and other techniques. The practitioner searches for the “right key” in order to talk to the brain and not at the brain. The practitioner makes adjustments in protocols according to detailed feedback from the client at each session. Experienced practitioners learn to engage in conversations with the client’s brain and mind at the same time and when the two conflict, the practitioner follows the symptoms that the brain is revealing. This process continues until the practitioner and client agree that functioning has improved to a degree that neurofeedback is no longer needed.

Counseling is an important piece of this process, as talking helps the client to process traumatic experience from the more rational and linear left brain, thereby placing it in the past instead of constantly reliving it in the present.
Research Subquestion 4

Research subquestion 4 states, “What is the role of counseling in neurofeedback training with individuals with trauma symptoms?

Whether neurofeedback practitioners integrate counseling into their practice or whether they recommend that clients have another therapist, counseling and neurofeedback complement each other in the treatment of trauma survivors. Two participants likened counseling a trauma survivor without neurofeedback to “doing surgery without anesthesia.” Likewise, neurofeedback without counseling could leave the trauma survivor floundering in relationships. Neurofeedback calms the emotions of fear, rage and shame so that the client can engage in the counseling relationship.

Neurofeedback is not just “fixing brain waves.” Instead, it brings about a “transformational process” of personality change as the brain regulates itself. Since a personality can be organized around affect, when symptoms of that affect begin to resolve, the client may be left with identity questions such as, “Who am I? If I am not this terrified raging shame-based person, who am I?” Neurofeedback calms the affect, and counseling helps the client to answer the questions that arise as identity shifts. Neurofeedback makes the brain more flexible, and counseling creates the holding environment of safety that allows the client to consider options and to think about events in different ways. Like peeling an onion, neurofeedback and counseling work together to regulate emotion, make the brain more flexible, and then to process and inhabit the new “way of being in the world” that occurs. Either individual or family counseling may be needed, as changes in the individual affect the group.
Research Subquestion 5

Research subquestion 5 states, “What are neurofeedback providers’ reflections about their experiences in providing neurofeedback training to those who have experienced trauma?”

Neurofeedback makes trauma treatment easier on both client and practitioner. Before the client talks specifically about traumatic experience, the practitioner uses neurofeedback to target hyperarousal symptoms and calm the neurological system. Clients talk about the traumatic experience only if they want to, and if they can do so without once again disregulating their neurological system. If clients become upset by discussing the traumatic experience, practitioners realize that they must more effectively calm the central nervous system. Since neurofeedback can calm the neurological system without a detailed discussion of the trauma, the process is easier on the practitioner:

It’s like you and I are going to deal with your nervous system and...you know I’m a human being...I hear what’s happening with them... I can be moved by that but I am not dragged into their trauma...and that’s a huge difference.... So my mental health is not compromised by that. (Helen, Interview #1, lines 1044-1059)

Vicarious trauma and compassion fatigue are not the salient issues in neurofeedback trauma treatment that they are in traditional talk therapy.

Research Subquestion 6

Research subquestion 6 states, “To what extent do multicultural factors influence treatment outcomes when neurofeedback is used to treat individuals with trauma symptoms?”

Anything that interferes with communication has the potential to have a negative impact on the neurofeedback process, which relies heavily on accurate feedback from clients. However, since neurofeedback treatment is not as “culturally loaded” as traditional talk therapy, all participants agreed that racial and ethnic factors exercise a minimal impact on treatment
outcomes. Although more women come for treatment than men, both genders respond well.

Age is also not an issue, as participants have successfully treated individuals ranging in age from 3 months to 96 years old. Improvement in older people may take a bit longer, but individuals demonstrate improvement at any age.

Several factors do tend to have an impact on the process. One participant noted that personality type affects the process, as the Myers-Briggs ISTJ (Introvert/Sensing/Thinking/Judging) personality type tends to have more difficulty engaging in the process. The most prominent multicultural factor influencing treatment outcomes is socioeconomic status. Clients must have sufficient financial resources to initiate treatment and then to stay in treatment over time.

Summary

The results of this study indicate that the neurofeedback practitioner plays a central role in treatment outcomes for trauma survivors. The practitioner creates an atmosphere of safety and hope for the client who has come to neurofeedback as a “last resort.” Business practices support the therapeutic process as the practitioner forms a therapeutic alliance and begins the neurofeedback process with a thorough assessment and screening. The neurofeedback process continues with treatment protocols that are adjusted each session through client feedback that continually strengthens the therapeutic alliance. Practitioner consultation and referral sources increase positive outcomes. In addition, counseling is an important factor in processing the identity changes that may occur as symptoms resolve. Client multicultural factors of race, ethnicity, gender, and age were not perceived as negatively affecting treatment outcomes; however, socioeconomic status affects client ability to enter and continue in treatment. The external factors of the neurofeedback field, the medical field, and insurance policies interact with
the therapeutic process in both positive and negative ways. In accordance with grounded theory
tradition (Corbin & Strauss, 2008), a visual representation of this theory is depicted in a final
concept map in Figure 4.13.
Figure 4.13

Final Concept Map

External Factors:
Neurofeedback Field, Medical Field, Insurance Policies

Client
Miserable, Last resort, Motivation, Fortitude, Active, Fear, Physical Factors, Family System, SES

Therapeutic Process
Counseling
Atmosphere

Practitioner
Risk-taker
Lifelong Learner
Reflective Experience
NFT Personal Experience
Passion
Trauma Understanding
Neuroscience Knowledge

Referral Sources
Consultation
Negative Effects
Feedback
Protocol

Neurofeedback Process
Positive outcomes increased

Business Practices

Negative Effects
Feedback
Protocol

Neurofeedback Process

Therapeutic Alliance

Process: Assessment Screening Processing Fear/Motivation

Neurofeedback Process
CHAPTER FIVE
DISCUSSION

The purpose of this grounded theory qualitative study was to explore the factors and processes that contribute to treatment outcomes when neurofeedback is used with individuals with trauma symptoms. Neurofeedback practitioners considered to be effective in treating trauma survivors were identified through a nomination process with a snowball sampling method. By requesting each nominated practitioner to identify three to five other practitioners suitable for this study, I received the names of 32 neurofeedback practitioners (19 women and 13 men), contacted 18 nominated practitioners (9 women and 9 men), and received positive responses from 10 practitioners who composed the study participants.

Participants consisted of seven women and three men ranging in age from mid-50s to late 70s. All were Caucasian. All were actively engaged in private practice in 6 different states representing 4 different regions of the United States, including large and medium metropolitan areas, a small college town, and rural towns of 3,000 to 4,000 people. The study included three participants who operate an integrated practice in which they divide their time more or less equally between neurofeedback and counseling services and seven participants who offer primarily neurofeedback in their practices, although they may do some brief or solution-focused counseling. Participants included licensed professionals from three branches of the mental health professions, including counseling, social work, and psychology, and one practitioner certified in biofeedback and neurofeedback.

Participants ranged from 14 to 40 years of experience in psychotherapy practice, with 25 years being the median. Experience in neurofeedback practice ranged from 4 years to 21 years, with 15 years being the median. The number of clients they see per week ranged from 8 to 10 to
more than 100, with 25 or more being the median. Between 25% and 95% of their clients have some form of trauma as an underlying issue, with 65% being the median.

Data collection took place in three rounds over a nine month time frame. The first round of data collection consisted of a face to face semi-structured interview, with one exception due to geographical limitations. The second round consisted of a semi-structured telephone interview, and the third round was an email follow-up. I transcribed the majority of the interviews. My research team and I analyzed the data as the interviews were transcribed and met on a regular basis to reach consensus on themes.

**Findings**

Results of this study indicated that the practitioner plays a central role in neurofeedback treatment outcomes with trauma survivors. Practitioners tend to be open to new experiences as they think “outside the box.” They are risk-takers who willingly take on new challenges. They initially incorporated neurofeedback into their practices despite “sweating blood,” and being “scared to death,” and continue to take risks in adding new equipment and facing uncertain client reactions to treatment. They regularly engage in continuing education activities, including attending conferences and local trainings, consulting with colleagues, and keeping current on the literature. They are lifelong learners who are “always looking” for better methods in order to offer clients “the best that’s out there.”

In addition, effective practitioners are experienced in psychotherapy practice as well as in neurofeedback practice. Their wide understanding of trauma in all its forms and their knowledge of neuroscience provide the theoretical underpinnings for treating trauma survivors. Their passion for the field is often rooted in their personal experience of neurofeedback efficacy, and many utilize neurofeedback training on themselves. They do their own therapeutic work, care
for clients, and further the field through research publications, presentations, leadership in professional organizations, and training and mentoring others. Their commitment could be summed up in the statement of one of the practitioners, “It’s not work; it’s a passion.”

The practitioner sets the framework for the therapeutic process by creating an atmosphere of safety that inspires client hope and confidence in the process and “sets up the possibility for healing.” Set within the framework of the therapeutic process, the neurofeedback process begins with a thorough assessment in which the therapist acts as a “detective agency,” looking “outside the box” and beyond previous diagnoses to identify the root problem. The therapist screens out clients for whom neurofeedback may not be beneficial at the present time and provides appropriate referral sources for these clients.

Therapeutic skills such as empathy, “feeling a sense of what they feel,” establishing “trust” within a “nurturing relationship,” processing client fear of change, and “being there” as a stable presence, all promote the strong therapeutic alliance that is essential for successful outcomes. The therapeutic alliance is strengthened by the constant interplay between client and therapist in which the client gives feedback on the effects of the previous session and the therapist responds by adjusting protocols. Both art and science contribute to this interplay, as the therapist listens to both the brain and the mind of the client and utilizes an “intuitive sense” in making adjustments. Many therapists describe having a “big bag of tools” and a “whole array in my armament to help people” so that they can change or supplement techniques according to client feedback. The therapist constantly looks for the “right key” in order to talk “to” the brain and not “at” the brain. Experience and reflective practice help the therapist to be flexible and to stay calm in the face of negative effects and unexpected client abreactions that may be “scary”
for both practitioner and client. Throughout the therapeutic process the practitioner seeks consultation when “stuck” and provides referral sources for the client when necessary.

Neurofeedback and counseling complement each other in the therapeutic process. Neurofeedback calms the brain so that the client can engage more effectively in the counseling relationship. As symptoms diminish, the counseling relationship provides the “holding environment” where the client can then process questions of identity such as, “Who am I now? If I am not this terrified raging shame-based person, who am I?” Neurofeedback assists the brain in forging new neuronal pathways, making the brain more flexible. This flexibility allows the client to consider new ways of thinking, feeling, and behaving suggested by the therapist. Neurofeedback provides the foundation for a “transformational process,” that entails much more than “shedding symptoms” or “fixing brain waves.” In addition, the use of neurofeedback with trauma survivors lessens the impact of client trauma on the practitioner, thereby decreasing the incidence of practitioner vicarious trauma and compassion fatigue.

A savvy business sense provides the foundation of the therapeutic process by allowing practitioners to “stay afloat.” Practitioners mentioned the use of technicians, monitoring the cost of equipment, marketing their services, and researching their practices to determine the effectiveness of their techniques as well as the source of their referrals. One practitioner mentioned a large training facility that “went under” due to unwise business decisions and lamented the closing of that facility as a loss to the field.

Typical clients who engage in neurofeedback treatment are “miserable,” “have tried everything else,” and try neurofeedback as a “last resort.” Client factors that influence treatment outcomes include motivation, described as “you gotta have a want to” and fortitude to stay with the process over time. Based on information provided by participants in this study, physical
factors that may hinder successful outcomes include chronic infections such as Lyme disease, unidentified allergies, benzodiazepine medications, poor nutrition, insufficient water intake, and neurological toxins such as aspartame. Psychological factors include a fear of health and a toxic family environment. Since it is not as “culturally loaded” as traditional talk therapy, practitioners perceived neurofeedback as having good cross cultural efficacy. Race and ethnicity appear to have minimal impact on the process, and age and gender do not seem to make a difference in outcomes. Socioeconomic status is the only multicultural factor that practitioners mentioned as influencing treatment outcomes, since financial resources are necessary to initiate and to stay in treatment.

External factors that interact with the neurofeedback therapeutic process in both positive and negative ways include the neurofeedback field, the medical field, and insurance policies. The neurofeedback field gains credibility from those who conduct high quality research and maintain high standards of practice. On the other hand, stories of unethical treatment performed by untrained and uncredentialed individuals perpetuate the image of neurofeedback being nothing more than “high tech snake oil.” Gains in credibility translate into more publicity, meaning potentially more acceptance by the medical field and the public, while loss of credibility may diminish these gains. The medical field sometimes perpetuates the overall “culture of medication” that encourages people to “take a pill and be fixed,” rather than resolve the root causes of problems. Some physicians believe in the efficacy of neurofeedback treatment, refer patients to practitioners, and cooperate in adjusting medication doses. Others discourage patients from either starting or continuing the process by saying they are “wasting their money.” Insurance policies either encourage or discourage clients from seeking neurofeedback treatment by either paying or refusing payment for services.
Comparison to Existing Literature

Several potential factors that contribute to psychotherapy outcomes have been identified in the literature. The therapist has been the focus of numerous studies, as research has indicated that therapist competence is crucial for successful results (Ronnestad & Skovholt, 2003). Asay and Lambert (1999) identified four common factors in the therapeutic process that contribute to outcomes. Their research indicates that extratherapeutic change associated with the client accounts for 40% of client improvement, expectancy or placebo effects accounts for 15%, the therapeutic relationship accounts for 30%, and techniques account for 15%. Participants highlighted all five of these factors as contributing the neurofeedback treatment outcomes.

Practitioner

The results of this study indicate that the practitioner is central to positive treatment outcomes using neurofeedback with trauma survivors. The mental health literature contains a significant amount of research on the characteristics of master therapists and experts, the professional development of therapists, and the therapist as a wounded healer. These studies indicate that the therapist is one key to successful therapeutic outcomes.

Master therapists. The master neurofeedback practitioners in this study demonstrate many of the same cognitive, emotional, and relational qualities of master therapists delineated by Jennings and Skovholt (1999). In the cognitive domain, Jennings and Skovholt described master therapists as being voracious learners, as using experience as a major resource, and as valuing “cognitive complexity and the ambiguity of the human condition” (p. 6). Participants in this study were lifelong learners who were “always looking” for better treatment options in order to offer their clients “the best that’s out there.” They highlighted experience as being vastly important and were reflective about their practice. They valued complexity in looking “outside
the box” for root causes and understood the complexity of the ongoing therapeutic process in both the technological and emotional aspects.

In the emotional domain, Jennings and Skovholt (1999) described master therapists as being emotionally receptive in that they are “self-aware, reflective, nondefensive, and open to feedback” (p. 7). They are “mentally healthy and mature individuals” who take care of themselves and who realize that their own health affects their work with clients. Participants in this study were receptive both to client feedback and to colleague consultation. Many demonstrated an awareness of the importance of maintaining their own mental health by having engaged in neurofeedback training themselves and by continuing self-care activities.

Jennings and Skovholt (1999) described master therapists in the relational domain as having “strong relationship skills” (p. 7), believing in the importance of the therapeutic alliance, and being able to use their relationship skills in therapy to both support and challenge clients. In particular, they are comfortable with clients’ intense emotions. Participants in this study discussed the therapeutic alliance as an essential overarching piece of the neurofeedback process. They demonstrated an ability to listen, to care for clients, and to process fears. Many mentioned offering solution-focused therapy during check-in times before the actual neurofeedback training began. They emphasized the importance of being “unflappable,” as a stable presence in the face of client abreactions.

Results of this study indicate that master neurofeedback therapists demonstrate many of the same characteristics described in the Jennings and Skovholt (1999) CER model of expertise likened to the three legged stool of cognitive, emotional, and relational characteristics. It would seem that effective neurofeedback practitioners, despite the addition of technological equipment to the therapeutic process, are master therapists as well as neurofeedback specialists. The
addition of technological equipment to the therapeutic process does not negate the importance of the emotional and relational domains.

**Experts.** Qualities of experts in other fields have been discussed in the mental health literature (Jennings, Hanson, Skovholt, & Grier, 2005). Of particular interest to this study is the research finding that, in contrast to novices, experts generally spend more time analyzing the complexity of a problem at the beginning of the process before deciding on a solution (Glaser & Chi, 1988). In the mental health field, delayed diagnoses tend to be more accurate (Hill & Ridley, 2001). In this study the careful initial analysis corresponds to the thorough assessment at the beginning of the neurofeedback process in which the practitioner acts like a “detective” in thinking “outside the box.”

In addition, in contrast to novices, experts tend to more accurately judge their knowledge base and skill level, thereby more accurately assessing their limitations (Glaser & Chi, 1988). Expert practitioners in this study were shown to consult regularly, even if they had already accumulated a vast amount of experience.

**Professional development.** Skovholt and Ronnestad (1992) described many themes in therapist development that emerge in the description of neurofeedback practitioners in this study. This section will highlight just a few. The continuous reflective practice, highlighted as a “central developmental process” in the Skovholt and Ronnestad (1992) study, can be seen in the neurofeedback practitioners’ discussion of treatment failures or disappointments as well as their successes. Reliance on internal rather than external expertise (p. 510) is indicated in the neurofeedback practitioners’ mixture of art and science and having an “intuitive sense” in formulating treatment. “Development is influenced by multiple sources” (p. 511) compares to the emphasis that the neurofeedback practitioners placed on mentoring, continuing education,
consultation, as well as feedback from clients. Participants agreed that the “post-training years are critical for optimal development” (p. 511) as all emphasized the importance of ongoing education.

**Wounded healer.** Many of the neurofeedback practitioners in this study alluded to personal experiences of recovery from trauma or physical illnesses. In their own journey of recovery to helping others recover, they may be likened to the wounded healer found in literature across time and cultures, and discussed in both the medical and mental health literature.

> Wounded oysters build out of gory wounds a pearl.
> And create within the gap of pain a jewel.
> May we be so wise. . .

> The pearl is the transformation of pain.


Wounded healers are individuals whose personal experience of suffering is transformed into a constructive healing force for fellow sufferers. Although the exact term *wounded healer* seems to appear only in the second half of the twentieth century, images of the wounded healer begin in ancient literature and appear throughout history and in various cultures. The term eventually appeared in the medical and mental health fields (Henry, 1967; Jackson, 2001).

In Greek mythology Chiron the Centaur, having suffered both emotional and physical wounds, became a protector and teacher of children as well as an instructor in healing practices. Plato wrote that the most expert physicians are those who possess both knowledge and personal experience of diseases. The Bible includes references to the Messiah as a “man of sorrows and acquainted with grief” (Isaiah 53:3). Religious shamans in various cultures possess a personal experience of woundedness that provides power to heal others. In the mental health field, Carl
Jung (1875–1961) used the term *wounded physician* to describe the therapist that looks at his own issues along with those of the client, resulting in an interaction that transforms both. Several Jungian therapists later used the term *wounded healer*, a phrase that occurs in both the medical and mental health literature (Henry, 1967; Jackson, 2001).

The theme of the wounded healer surfaces in this study as 7 of the 10 participants alluded to their own personal journeys through various forms of emotional trauma or physical illness or both. These personal experiences have deepened their awareness of therapeutic dynamics as well as their commitment to neurofeedback as an effective treatment for a wide range of disorders.

Coming from a “chaotic background” has made Sarah sensitive to necessity of “being aware of your own issues” as well as “what is going on in the room.” Neurofeedback cured Gaylen of emotional and physical problems stemming from childhood trauma. Trauma survivors now compose 85% of her private practice clients. In addition, she has trained mental health professionals at a children’s clinic to use neurofeedback with children who have experienced trauma. Julia was cured of migraine headaches through biofeedback and chronic fatigue syndrome from neurofeedback. She now utilizes both in her practice and specializes in the treatment of migraine headaches. Marian sustained a “pretty nasty head injury” at five years old and described knowing “a little bit about what it’s like to have extreme fear and be stuck in a state.” She now specializes in the treatment of head injuries and PTSD. Helen witnessed her son’s improvement from a seizure disorder and psychiatric symptoms after neurofeedback. In undergoing her own neurofeedback training, she was healed of hypoglycemia and chronic fatigue syndrome. She now operates a neurofeedback clinic, travels nationally and internationally to teach neurofeedback, and regularly supervises practitioners. Neurofeedback
provided Barbara with relief from her struggle with anxiety, and she now operates a thriving
practice and organizes trainings for other practitioners. David, a former veteran, was cured of 30
years of back pain in a neurofeedback session. He now treats veterans free of charge if they
cannot afford to pay. Perhaps David best summarized the wounded healer theme in stating, “We
try it on ourselves first, and then what works, we pass along.”

This research study identified 10 therapists considered expert in providing neurofeedback
services to trauma survivors. The fact that seven of these 10 identified expert therapists
mentioned their own recovery from physical or emotional issues rooted in trauma may indicate
that master therapists have sought healing and have learned to use their wounds constructively in
the therapeutic process. This fact is also congruent with the findings of Jennings and Skovholt
(1999) that in the emotional domain master therapists “attend to their own emotional well-being”
(p. 7).

Therapeutic Process

Expectancy and placebo effects. Asay and Lambert (1999) estimated that
approximately 15% of treatment outcome is due to expectancy or placebo effects, sometimes
called the hope factor. Results of this study indicated that the hope factor contributes to
neurofeedback outcomes as practitioners designed their office spaces to create hope in clients
who were described as generally coming to neurofeedback as a “last resort.” One practitioner
described the placebo effect of staying calm when clients become upset or when treatment does
not proceed as planned. Another practitioner highlighted the fact that clients may sometimes
experience negative effects from neurofeedback as evidence that neurofeedback is not merely
placebo; however, one practitioner pointed out that even negative effects may actually increase
hope that the neurofeedback is actually accomplishing something and is not merely a “scam.”
Another practitioner unabashedly stated, “Placebo works!” Participants in this study engender hope in clients through the atmosphere created in their offices, through assuring them that they have treated similar problems with successful results, through staying calm in unexpected client reactions, and in generally “being there” for clients in a strong therapeutic relationship.

**Therapeutic alliance.** Results of this study indicated that the therapeutic alliance is an essential ingredient to positive neurofeedback outcomes just as it is crucial to successful psychotherapy (Asay & Lambert, 1999; Horvath & Symonds, 1991; Sexton & Whiston, 1994). The manner in which the client-therapist relationship influences treatment outcomes has been one of the oldest and most researched topics in the psychotherapy field (Horvath & Symonds, 1991). The thinking on this relationship has shifted in emphasis through the years. It began with Freud’s discussion of client transference toward the therapist in the early 1900s and shifted to the use of the term *working alliance* (Greenson, 1967) to describe the positive client-therapist collaboration necessary for successful therapeutic outcomes. Carl Rogers later put the emphasis on the therapist, theorizing that the therapist’s capacity for empathy, congruency, and unconditional positive regard created the necessary conditions for client growth. Recent studies have indicated that the working alliance concept may more accurately reflect the positive relationship between therapist and client that brings about change, as both the therapist and the client bring crucial factors into the therapeutic process (Horvath & Symonds, 1991). In fact, according to research on the common factors theory of therapy, 30% of client improvement depends on the therapeutic alliance and only 15% on techniques (Asay & Lambert, 1999). Although this study did not seek to quantify the amount of influence the therapeutic alliance exerts on treatment outcomes, participants were clear that the therapeutic relationship is
important in neurofeedback outcomes, and that both therapist and client bring important factors into the therapeutic process.

**Neurofeedback process.** Findings from this study differed from the common factors model described by Asay and Lambert (1999). According to Asay and Lambert (1999), only 15% of psychotherapy outcomes are derived from actual techniques, which are more or less interchangeable. In contrast to these findings, participants in this study emphasized the necessity of having a “big bag of tools,” a “mix of skills,” and “a whole array in my armament to help people.” For the most part, participants viewed the ability to change neurofeedback treatment protocols either on the same machine or by adding different neurofeedback or biofeedback techniques as an essential ingredient in successful outcomes, quite possibly accounting for more than 15% of therapeutic outcomes.

In addition, findings of this study emphasize the therapist as being central to the process, in contrast to the Asay and Lambert (1999) finding that de-emphasizes the therapist role. It may be that since neurofeedback therapy requires more technological knowledge, the therapist is more central to the neurofeedback process than to the psychotherapy process.

**Client Factors**

Research participants in this study concurred that client factors as well as therapist factors contribute to treatment outcomes. Asay and Lambert (1999) assert that as much as 40% of client improvement derives from extratherapeutic factors related to the client. These client factors may include the nature of the problem, motivation, ability to relate, ego strength, and family and social support. Participants in this study identified motivation, the family system, and the nature of the problem as potential client factors that contribute to treatment outcomes.
The perception of the research participants that multicultural factors exert little or no influence on neurofeedback treatment outcomes, with the exception of socioeconomic status, is congruent with the neurofeedback literature. Although few specifically multicultural studies exist, one study has indicated that neurofeedback can be adjusted in a culturally sensitive manner with positive treatment outcomes in a Native American population (Kelley, 1997). Studies have also indicated successful neurofeedback results with groups composed of both males and females (Saxby & Peniston, 1995; Scott, Kaiser, Othmer, & Sideroff, 2005), those representing a range of ages (Scott, Kaiser, Othmer, & Sideroff, 2005), and both Caucasian and African American participants (Fahrion, 1995).

Drawing from the responses of the current participants as well as from the neurofeedback studies to date, it would seem that neurofeedback could be a successful treatment option in a wide range of cultural situations. The challenge is creating a conduit for neurofeedback services to be brought to these diverse populations.

Limitations

There are several limitations to this study that should be noted. Limitations that involve me as the lead researcher include my biases and assumptions as well as my inexperience. I attempted to monitor my biases and assumptions by sharing them with my research team at the beginning of the study in written verbal form as well as in an initial concept map. My research team assisted in balancing my biases by highlighting themes and interactive processes that I would have missed without their insight. Even with these safeguards in place, it is possible that I missed important factors and processes that should have been included, both due to my biases as well as my inexperience in qualitative research.
A second set of limitations involves the participants selected for this study. I identified study participants through a nomination process with a snowball sampling method. Although I attempted to obtain a representative mix of practitioners, there is a lack of diversity in the group. First, all were Caucasian. Although this fact reflects the racial and ethnic demographics of the neurofeedback field at the present time, it is unrepresentative of contemporary United States demographics. Furthermore, the majority of the participants were women. Although I contacted an equal number of men and women for this study, seven out of nine women agreed to participate, while only three out of nine men agreed to participate. This participant demographic skew may have also skewed themes in ways unknown at this time.

Secondly, for several reasons, these 10 participants may not be representative of neurofeedback practitioners as a whole. First, the snowball sampling method may have excluded expert practitioners just as effective in their practice, and yet unknown to the informants. Secondly, I could not follow up on some nominations of highly regarded practitioners due to budget and geographical constraints. There are very likely many expert practitioners whose voices were not included in these research findings. Third, many of these practitioners joined the neurofeedback field when it was relatively young and unknown. If the neurofeedback field becomes more accepted and established, it may be that practitioners who join at this later time may vary considerably from this earlier group.

Lastly, the number of participants may also be considered a limitation. The research team and I agreed that the data seemed to be getting saturated as we approached 10 participants. At that point we were not identifying any new themes, and we were seeing variations and depth in the themes that we had identified. However, there is no way of knowing what important information more participants would have added to the research.
Implications

There are several implications to the findings from this research study, particularly for counselors and counselor educators. First, although none of the neurofeedback practitioners in this study specifically advertise themselves as specializing in trauma, 25% to 95% of their clients have trauma as an underlying issue, with 65% being the median. One possible exception to this statement is Marian, who recruits veterans and other individuals with TBI and PTSD for research studies, but those individuals do not compose her entire client load. With such a significant portion of clients being trauma survivors, it would seem that CACREP has made a strategic decision in mandating that teaching on trauma be incorporated into the counseling curriculum (CACREP, 2009). The effect of all forms of trauma on human functioning, along with various treatments, is an important addition to counselor education programs.

Although CACREP has taken an important step in mandating that teaching on trauma be infused into the counseling curriculum (CACREP, 2009), the requirements may not go far enough. The impact of complex or developmental trauma could be emphasized in particular. Courses could include symptoms, treatment, and a neuroscience perspective in order to better train counselors to help individuals with complex trauma. In addition, a specialized track on trauma could be an important addition to counselor education programs.

Secondly, if we include a wide definition of trauma that includes head injuries, an even larger percentage of clients have experienced trauma. Both Marian and John highlighted the fact that clients may go through years of various types of psychotherapy with minimal improvement because the root cause of the emotional and psychological problems is actually an undiagnosed head trauma. It would seem that including assessment for head trauma, along with appropriate
referral sources, should also be emphasized in our counseling courses and ongoing education events such as regional and national conferences.

In addition, some basic knowledge of neuroscience as well as neurofeedback would be helpful to counselors. Recent developments in neuroimaging techniques and the current findings of the manner in which trauma may impact the brain should be incorporated into the counseling curriculum if the counseling profession is to stay current with the research. Findings from this study indicate that neurofeedback may be an effective complement to counseling. Although most counselors probably will not decide to incorporate neurofeedback into their practices, knowing treatment options and the manner in which a counselor and a neurofeedback practitioner can work together may have significant potential for increasing positive outcomes for clients.

There is one more implication for counselor education. Some universities have begun offering a specialized track that leads to biofeedback and neurofeedback certification from the Biofeedback Certification International Alliance (BCIA) in their masters level counselor education programs. The Council on Accreditation of Counseling and Related Educational Programs (CACREP) has already mandated that teaching on trauma be infused into every aspect of the counseling curriculum. If research studies on neurofeedback continue to indicate its effectiveness in alleviating the wide range of issues rooted in traumatic experience, more universities may do well to consider widening their course offerings to include a biofeedback and neurofeedback track.

Lastly, findings from this study indicate that neurofeedback trainings and conferences, which generally emphasize the various equipment choices and the technological aspects of neurofeedback practice, would do well to remind participants that therapeutic skills are still
crucial in the neurofeedback process. Likewise, counseling training programs, conferences, and other continuing education events would do well to incorporate teaching on neuroscience and neurofeedback into their educational offerings.

**Suggestions for Future Research**

The findings of this study indicate that the neurofeedback practitioner is central to treatment outcomes with trauma survivors. In addition, therapeutic skills and the therapeutic alliance are crucial to the neurofeedback process as they are important in traditional talk therapy. Future research may expand on the themes highlighted in this study.

This study encompasses qualitative research done exclusively from the neurofeedback practitioner’s point of view. Therefore, the centrality of the practitioner as well as practitioner factors such as continuing education may be overemphasized and the importance of client factors may be underemphasized. A qualitative study from the trauma survivor’s viewpoint concerning what factors and processes contributed to treatment outcomes might provide a more balanced view of the process. Although qualitative studies from the client’s viewpoint have been completed in other areas of neurofeedback treatment (Byrne, 2005; Monjezi, 2005; Parker, 2003; Parsons, 2008) none currently exist from the trauma survivor’s point of view.

One participant suggested that more studies in the neurofeedback field be completed specifically to answer the question, “When neurofeedback doesn’t work, why doesn’t it work?” In addition, more research studies concerning effective treatment protocols for all the various types of trauma would add to the body of research already in existence.

Other research may provide more understanding of the development of master therapists and expert neurofeedback practitioners. What kind of inner motivation makes someone become
an expert while another remains mediocre? Furthermore, is there a way to inspire excellence within our mental health training programs and beyond?

**Personal Reflection**

I was intrigued by neurofeedback before this study began, and I was curious about what participants would say as I began the data collection process. However, even by the second interview I began to sense that this was going to be much more than a dissertation research study. The more interviews I completed, the more sure I was that I was involved in a life-changing process. As I am now at the end of this study, I realize that my sense during the second interview was correct, and that I will never be the same both personally and professionally. The participants in this study have inspired me to keep learning and growing. Even as I finish my PhD I have enrolled in an online biofeedback course on physiology. I view the assessment process in a more holistic manner, I am more sensitive to evidence of trauma in my clients’ lives, and I have widened my view of trauma to include traumatic brain injury. I have begun to think of neuroscience findings when I sit with clients, and I frequently recall the phrase “the brain becomes mind.” As I return to Moscow, Russia to teach counselors and to start a counseling center, I plan to incorporate teaching on trauma into the curriculum. I also plan to offer biofeedback and neurofeedback in the counseling center. Even though separated in geographical distance, my participants go with me wherever I go. This research has truly been a life-changing experience.
Summary

The findings of this study concur with previous studies that the therapist is crucial to treatment outcomes, and that therapist cognitive, emotional, and relational characteristics are all important in the therapeutic process. In accordance with Asay and Lambert (1999), results of this study indicate that the therapeutic alliance, placebo effects and client factors contribute to successful neurofeedback outcomes as they do in traditional talk therapy. Findings that multicultural factors, with the exception of socioeconomic status, have minimal impact on the neurofeedback process are consistent with the neurofeedback literature. Results of this study differed from the Asay and Lambert (1999) model that suggests that techniques are interchangeable, whereas participants emphasized the effectiveness of having a “big bag of tools” and finding the “right key” in order to talk “to” the brain and not “at” the brain. In addition, whereas Asay and Lambert (1999) minimized the importance of the therapist, this study emphasizes the central role of the therapist in therapeutic outcomes.
CHAPTER SIX
MANUSCRIPT SUBMISSION

Treating Trauma Survivors with Neurofeedback:
A Grounded Theory Study

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Abstract

A qualitative grounded theory design was used to explore factors and processes that influence treatment outcomes when neurofeedback is used with trauma survivors. Research results indicate that the neurofeedback practitioner is central to the treatment process. Other prominent themes included the therapeutic process, the neurofeedback process, client factors, and external factors. Findings suggest that practitioner therapeutic skills are crucial to neurofeedback outcomes, and that counseling and neurofeedback may effectively complement each other in trauma treatment.

Keywords: trauma, neurofeedback, grounded theory
Background

Neuroscience, the mental health field, and the concept of trauma as an underlying factor in mental and physical disorders have been inextricably linked since the inception of the mental health professions in the late 1800s, when Sigmund Freud and other physicians from the new professions of neurology and psychiatry studied hysteria. During World War I combat neurosis or shell shock was identified. In 1980, after the Viet Nam war, the impact of trauma was officially recognized when posttraumatic stress disorder was included in the *Diagnostic and Statistical Manual of Mental Disorders, III (DSM-III, 1980).* Since the mid-1970s, the feminist movement has encouraged recognition of the adverse effects of interpersonal trauma (Herman, 1997), described in the construct of complex trauma, or CPTSD (Courtois, 2008; Herman, 1997).

On July 1, 2009, the Council for Accreditation of Counseling and Related Educational Programs (CACREP) officially recognized the importance of trauma when it mandated that disaster response, crisis intervention, and trauma knowledge be integrated into nearly every aspect of the counseling curriculum (CACREP, 2009). With the emphasis that CACREP has placed on trauma in the curriculum, it seems reasonable to investigate a wide variety of trauma treatments. Neurofeedback, based on recent neuroscience research, is one of those treatments.

Through neuroimaging techniques, neuroscience research has indicated that trauma affects the manner in which the brain receives and processes information (van der Kolk, 2006). Traumatic experience during the early developmental years may have an especially deleterious impact on all domains of functioning (Perry, 2002; Rothschild, 2000). Poor emotional regulation due to overarousal of the limbic system often results in limited problem solving skills, inadequate relational abilities, and somatic symptoms (Courtois, 2008; van der Kolk, 2003).

With foundations in neuroscience, neurofeedback is based on the brain’s plasticity that allows it to modify brain wave patterns in response to environmental changes (Charney, 2004).
Neurofeedback is biofeedback applied to the brain and the central nervous system (Hammond, 2006). Numerous quantitative studies have indicated that neurofeedback may be effective in ameliorating symptoms often rooted in traumatic experience such as depression and anxiety (Hammond, 2005), substance abuse (Kelley, 1997; Peniston & Kulkosky, 1999; Scott et al., 2005), posttraumatic stress disorder (Peniston & Kulkosky, 1991; Smith, 2008), and somatic symptoms such as migraine headaches (Stokes & Lappin, 2010) and fibromyalgia (Mueller et al., 2001). However, there is a paucity of research exploring the factors that produce those positive outcomes. The purpose of this grounded theory study was to explore the factors and processes that influence outcomes when neurofeedback practitioners treat trauma survivors.

**Method**

Since the purpose of qualitative research is to discover rather than to test variables (Corbin & Strauss, 2008), qualitative studies are appropriate when factors for quantitative research have not been fully identified. Grounded theory is a qualitative approach in which the researcher develops theory from fieldwork by exploring interacting concepts in a complex phenomenon. To be cohesive, one concept may be more prominent than the others as concepts interact in repeating action/interaction/emotional response patterns (Corbin & Strauss, 2008).

**Participants**

Neurofeedback practitioners considered to be effective in treating trauma survivors were identified through a nomination process with a snowball sampling method. Participants consisted of 7 women and 3 men aged from the mid 50s to late 70s. All were Caucasian. All were actively engaged in private practice in 6 different states representing 4 different regions of the United States, including large and medium metropolitan areas, a small college town, and rural towns of 3,000 to 4,000 people. The study included 3 participants who operate an
integrated practice in which they divide their time more or less equally between neurofeedback and counseling services and 7 participants who offer primarily neurofeedback in their practices. Participants included licensed counselors, social workers, psychologists, and one practitioner certified in neurofeedback by the Biofeedback Certification International Alliance (BCIA).

Participants’ years of experience in psychotherapy practice ranged from 14 to 40 years, with 25 years being the median. Experience in neurofeedback practice ranged from 4 years to 21 years, with 15 years being the median. The number of clients seen per week ranged from 8 to 10 to more than 100, with 25 or more being the median. Between 25% and 95% of their clients have some form of trauma as an underlying issue, with 65% being the median.

Data collection took place in 3 rounds over a 9 month time frame. The first round was a face to face semi-structured interview, with one exception due to geographical limitations. The second round was a semi-structured telephone interview, and the third round was an email follow-up. To preserve confidentiality and anonymity, participants were given a pseudonym.

Data Analysis

The research team consisted of six students or recent graduates of the counseling doctoral program at Old Dominion University. All had completed training in qualitative research. Using a constant comparative method (Creswell, 2007), the research team analyzed the data and met on a regular basis to reach consensus on themes. The lead researcher transcribed the majority of the interviews. The initial open coding process entailed analyzing individual participant’s words or phrases, followed by axial coding in which themes were categorized across participants. Finally, using a selective coding process, the practitioner was identified as the prominent theme around which the other themes were organized (Corbin & Strauss, 2008). The four other themes included: (a) the therapeutic process, (b) the neurofeedback process, (c) client factors, and (d)
external factors. In order to triangulate the data (Patton, 2002), participants were given the opportunity to review their transcripts, read the analysis results, and provide feedback.

Although Creswell (2007) recommends bracketing assumptions, others hold that bracketing is impossible since assumptions and biases often have deep cultural roots difficult to identify (Corbin & Strauss, 2008). Rather than bracket assumptions, I sought to use my experience to enhance the data gathering and analytic process by acknowledging my assumptions in a concept map (Strauss & Corbin, 2008) that I shared with my research team before data collection began. I utilized a reflexive journal and regularly met with my research team and research partner to debrief, to reach consensus, and to modify the concept map.

**Trustworthiness**

Important criteria for determining the rigor of a qualitative study include the amount of researcher time spent in the field as well as the amount of data from which the researcher draws conclusions (Creswell, 2007). The data for this study consisted of 31 hours of recorded interviews in addition to a written email follow-up. I spent approximately 40 additional hours in the field with participants in informal ways. In addition, I attended a four-day neurofeedback training before data collection began and a one-day conference during the study. The external auditor for this study examined the audit trail, which consisted of 1,290 pages of materials.

**Results**

The central research question for this study was, “What are the factors and processes that influence treatment outcomes when neurofeedback is used to treat individuals with trauma symptoms?” Five major themes, each with subthemes, emerged from the data. The central theme is the practitioner.
Theme 1: The Practitioner: “The Magic is not in the Box”

The practitioners in this study described themselves as being “open” to new ideas and experiences, and as frequently thinking “out of the box.” They entered the mental health field because they are people-oriented and relational, but then made the choice to tackle technological challenges that they describe as being “daunting,” “a huge leap,” “a steep/huge/enormous learning curve” and a “step of faith.” They described “sweating blood” and being “scared to death” when they incorporated neurofeedback into their practice. Gaylen mortgaged her house to purchase her first neurofeedback set. All were willing to take the “leap,” to undergo a “huge paradigm shift” because what they saw before them was so “dramatic” and “compelling” that they could not “walk away.” They are risk-takers who embrace new challenges.

Subtheme 1.1: Risk-takers. The risk-taking continues throughout the neurofeedback process. Practitioners stated that neurofeedback can be “scary” for both practitioner and client, as negative effects may happen unexpectedly. Trauma survivors may feel more “vulnerable” as they lose their “protective armor” or as flashbacks of traumatic events suddenly occur. Barbara described the strong inner fears of the therapist in the face of uncertain treatment results:

I have to always stay calm with clients...and if there is a problem to always reassure your client that everything’s going to fine because there’s that placebo effect that takes place like even if you’re scared to death inside and wondering oh no what did I do and how am I going to fix this? (Barbara)

Marian routinely expects minor side effects that indicate that neurofeedback results are not merely from a placebo effect.

A lot of people say this tiny signal can’t be having an effect so it has to be a placebo effect but I’m convinced it’s not because the most common reaction...you will have a
headache or feel really tired or re-experience the pain at the time of trauma with the first treatment or two... so negative things happen... if they have ever had a concussion, they are likely to have a headache... because there is a recall of the somatic experience.

Marian emphasized that clinicians must be “unflappable” in working with trauma survivors.

**Subtheme 1.2: “Always looking” (Lifelong learners):** These expert practitioners seem to possess an inner drive to surpass mere competence in order to be the best that they can be in their unique settings.

I think experts are always looking...the people that I think of as the best [emphasis]...are always looking for new approaches...they are talking to colleagues...when they get stuck they are talking...they are finding other people who are at their level of experience or that they trust. (Gaylen)

As a result of “always looking,” these practitioners have accumulated a “big bag of tools” (Sarah) and a “whole array in my armament to help people” (Julia) that may include play therapy, Eye Movement Desensitization and Reprocessing (EMDR), Dialectical Behavior Therapy (DBT), psychodrama, guided imagery, or hypnosis. Some utilize biofeedback along with neurofeedback to access the autonomic nervous system as well as the central nervous system. They often utilize multiple types of equipment. No matter what skills they already possess and what equipment they currently use, they are continually striving to improve.

What I really want to do is keep learning and stay on the cutting edge...I don’t want to coast...I want to always be one of the best...If I’m offering something to my clients I want to be able to offer them the best that’s out there...I’m always a little behind because there’s always a learning curve...but I... keep working and keep learning. (Barbara)

Staying on the “cutting edge” in order to offer clients “the best that’s out there” requires
dedication to continuing education. Most of the participants cited ongoing training as one of the most important factors for positive client outcomes. Julia stopped counting her continuing education units after she surpassed 1,000 post-doctorate hours. Participants attend national conferences and local trainings, participate in email listserves, and consult regularly with colleagues. Their conversations are interspersed with references to seminars, books, and professional journal articles. Most have had at least one strong mentor. In addition, most participants have published in professional journals. Some have researched their own practices in order to assess their effectiveness. All these activities result in consistent professional growth:

I'm a better clinician than I was a year ago and I'm certainly a heck of a lot better than I was 10 years ago but every year... I am better than the year before. (Barbara)

In addition to investing in themselves, the participants invest in others and in the field as a whole. They serve on the boards of their professional associations, organize local trainings for other professionals, and present at conferences. They mentor newer colleagues both formally and informally by taking on interns in their practices and through informal consultation.

**Subtheme 1.3: Reflective experience.** Participants counted their years of experience as being vastly important in client outcomes. When asked how much experience matters, most simply answered “a lot.” Experience gives “more information to draw from...it just pops right out when you need it” (Shirley). Experience helps practitioners to “recognize phenotypes” (Julia), handle abreactions, and encourages practitioners to keep searching for new protocols as they realize the limits of what they currently know. In addition, experience is not measured only in years, but in reflection on their varied experiences. Practitioners discussed their disappointments and mistakes as well as their successes, and what they learned from both.
**Subtheme 1.4: Neurofeedback personal experience.** Six practitioners in this study experienced dramatic physical and emotional changes from neurofeedback training. Others were convinced through seeing rapid changes in clients or family members.

Gaylen describes herself as a “poster child for everything neurofeedback can address.” She had posttraumatic stress disorder (PTSD) and a traumatic brain injury (TBI) as a result of childhood trauma until neurofeedback training eliminated her seizures, migraine headaches, and all PTSD symptoms, including her life-long startle response. Julia had spent “tens of thousands of dollars” seeking a cure from chronic fatigue syndrome and envisioned founding a “healing center” if she could ever recover. After neurofeedback she founded and manages one of the largest clinics in the country. Marian had struggled her entire life with memory and learning problems stemming from a childhood TBI. After neurofeedback training “it all changed...it changed my life...I couldn’t be doing this [the research] if I didn’t have that treatment.” She says, “Nothing else does this.” After Helen witnessed “profound” mood changes in her son due to neurofeedback training, she also began treatment and was cured of chronic fatigue syndrome. She currently manages a clinic and travels nationally and internationally to train others. David was cured of “30 years of back pain” in a neurofeedback session. Barbara “made more progress in 3 months of neurofeedback than in 20 years of counseling” for anxiety and panic disorder.

**Subtheme 1.5: Passion.** Risk-taking, lifelong learning with motivation to better serve clients, combined with their own personal experiences of neurofeedback produces a passion for the field and a vision for its future.

Just like everybody who gets into this field now it’s like oh my God if you thought of all the people you could be helping? Let’s get busy, let’s make this happen in the world. (Helen)
And these practitioners are making neurofeedback “happen in the world” in creative ways. Sarah has a plan to attract interns to her underserved area. Gaylen has trained mental health professionals to use neurofeedback with abused children in a children’s clinic. Charles carries portable neurofeedback equipment to clients’ homes if they are housebound. Marian recruits veterans for TBI and PTSD studies. Helen’s practice sponsored a research study at a residential treatment facility for drug and alcohol addicted individuals. David treats military veterans free of charge, saying “Money doesn’t stand in the way around here.” Several mentioned at times working either pro bono or on a sliding scale. Helen stated, “It’s not work; it’s a passion.”

**Subtheme 1.6: Trauma understanding.** Participants agreed that trauma is a common experience that takes many forms, including PTSD, complex trauma, and traumatic brain injury (TBI). However, clients may not realize that the underlying source of their symptoms is trauma. David noted that “half or less” of his clients come to therapy for the actual underlying problem, “so we have to figure it out.” Practitioners emphasized going slowly with trauma survivors due to potential abreactions and that trauma survivors need counseling in addition to neurofeedback.

Complex trauma, often rooted in early childhood abuse or neglect, causes disruptions in “every system of cognitive, learning, behavioral, emotional, and physiological [domains].” With trauma survivors Gaylen focuses on “always to be quieting fear.” Julia described complex trauma as having been “marinated in fear,” resulting in a “body clench” as if a person has been “holding onto something” for a long time. If a client has many somatic complaints, including migraine headaches or chronic upsets such as irritable bowel syndrome, or emotionally seems “paralyzed in life,” then Julia suspects trauma as an underlying factor. Helen described complex trauma survivors as having “no place of safety” in themselves, so that they feel overwhelmed and constantly threatened. Addictions and other self-destructive behaviors may result from the
feeling of low self-worth that often accompanies trauma. Sarah stated that underlying trauma issues in children are often misdiagnosed as AD/HD or some other disorder. Childhood trauma causes a "coping deficit" because the prefrontal cortex cannot develop when a child is continually in a "survival mode." Complex trauma can take many forms.

Marian’s definition of trauma includes all degrees of traumatic brain injury, including Cesarean sections and other “traumas that aren’t usually thought of as traumas but they’re a trauma for the brain.” She assesses carefully for any type of head injury because even mild head injuries can dramatically alter emotional responses and thinking processes.

Subtheme 1.7: Neuroscience knowledge. Participants discussed neurofeedback treatment protocols in terms of neuroscience knowledge. Sarah discussed the inability of the prefrontal cortex to develop normally in a child exposed to ongoing trauma. Gaylen described how “the brain becomes mind,” meaning that personality is formed through the underlying firing of brain neurons. She does not utilize cathartic therapies due to the maxim “what fires together wires together.” Discussing traumatic events before the brain is calmed down only serves to strengthen the neuronal pathways in an anxious, fear-based neurological system. Marian described the “neurochemistry of trauma” as the brain being “stuck,” being “frozen in a protective state” from “extreme fear.”

Fear may cause the brain to be “stuck,” but neurofeedback can help it get unstuck by modifying brain firing patterns. Marian emphasized that neuroplasticity, defined as “the brain’s ability to change,” is a practitioner’s “biggest ally” in neurofeedback treatment:

One thing I learned when I was working with hospice and cancer patients who were dying… is that there is something in every cell that keeps trying to fix itself and the brain is just sitting there waiting for us to find the right key…neuroplasticity is the thing.
Important factors in successful treatment involve the neuroplasticity of the client’s brain coupled with the practitioner’s ability to find “the right key” based on neuroscience knowledge.

**Theme 2: Therapeutic Process**

The therapeutic process begins with the office atmosphere, continues with the formation of the therapeutic alliance, and builds as the therapist responds to client feedback during every session. Neurofeedback is a major piece, but actually only one piece of this holistic process.

**Subtheme 2.1: Atmosphere.** The therapeutic process begins the moment a client enters the door. Barbara deliberately sets up a “friendly kind of atmosphere.” David spoke of the importance of a “loving atmosphere,” a “sense of love and God’s presence” that “sets up the possibility for healing.” Sarah’s office, located in a renovated church with stained glass windows, sets up a “safe, welcoming” environment that is a “huge factor” in therapeutic outcomes. The walls of Julia’s waiting room are decorated with enlarged newspaper articles of neurofeedback success stories, and a notebook filled with research articles and more success stories sits prominently on a table in the center of the room. I found myself wanting to be a client as I read these materials, and I wondered what degree of hope and confidence might be instilled in clients even before the actual neurofeedback process begins.

**Subtheme 2.2: Therapeutic alliance.** The office atmosphere provides the prelude to the formation of the therapeutic alliance, which grows over time and is particularly fragile with trauma survivors (Gaylen). In his 40 years of counseling experience, David’s most important lesson has been the centrality of empathy, an ability to “hear” clients, and to “feel a sense of what they feel.” The practitioner may be like a “coach” or a “support person” (Helen). “Trust” within a “nurturing relationship” is important (Barbara). A caring relationship is crucial because “anecdotally we learned that people are not used to being treated with care” (Sarah). Having
military clients, Marian sat through the movie *Hurt Locker* even when she wanted to walk out, thinking “These guys live [emphasis] this so surely I can watch a movie.” It is important to “be there” as a strong, stable, and calm support for trauma survivors (Barbara). Even in the midst of complicated technological equipment, David summed up the importance of the relationship in the neurofeedback process by saying, “I am not a technician…I am still a therapist.”

**Subtheme 2.3: Business practices.** Business practices constitute the foundation on which practitioners build the therapeutic process with clients. Marian observed that one prominent organization, now out of business due to poor decisions, no longer exists to train people. Practitioners discussed careful scheduling to “stay afloat” and equipment prices and sales. Julia’s marketing expertise shows in her ability to attract attention from the press. Helen markets her practice by offering a free first appointment in which she familiarizes people with neurofeedback. Without a savvy business sense, practitioners could not be helping anyone.

**Theme 3: Neurofeedback process: “We’re not fixing brain waves”**

Neurofeedback is more than “fixing brain waves” (Helen). It sets in motion a personality “transformational process” as the practitioner works at the intersection of the brain and the mind.

The most important lesson that I’ve gotten has been that the core of all of our psychological problems rest in the firing of the brain in some way…That all mental processes sit on top of this and that we have access to it…In neurofeedback you see an evolution of….the mind as the brain regulates itself. (Gaylen)

**Subtheme 3.1: Thorough assessment: “detective agency,” “outside the box.”** This “transformational process” starts with a thorough assessment and screening. Marian likened the assessment to being a “detective agency” in which practitioners look “outside the box” for the root problem. Marian assesses for head injuries, Lyme disease and other parasitic infections,
sometimes the root of psychological and emotional problems. She assesses for trauma by asking, “What’s the worst thing that has ever happened to you?” Clients may be sent for nutritional counsel or allergy testing, and may be told to stop ingesting aspartame, a neurological toxin.

**Subtheme 3.2: Screening: “Don’t waste your money with me!”** Either in conjunction with the assessment or separately, many practitioners utilize some type of screening process. Julia is very straightforward with clients in saying, “Don’t waste your money with me!” Clients are screened for chronic infections, some addictions, and possibly benzodiazepine medications that “take over the brain.” Practitioners may also assess client motivation. Through “good, careful informed consent,” Julia and Shirley stress to clients that neurofeedback is “not an instant fix.” David asks clients, “What do you have to give up?” in order to get better. Gaylen asks, “You can go through a wide range of changes. Are you ready for that?” Both Sarah and Gaylen highlighted the importance of processing fear since “health is scary sometimes.”

**Subtheme 3.3: Protocol: “Cast a wide net,” “Find the right key,” “Stabilize.”** With trauma survivors, practitioners move cautiously to “calm down” and “stabilize.” Julia talked of “casting a wide net” and having “a whole array in my armament to help people.” Participants often utilize multiple techniques because “Good therapists have always been very attuned to what people bring, and so they wouldn’t necessarily be wedded to one approach” (Marian). Practitioners “find the right key” in order to talk “to” the brain and not “at” the brain (Marian).

**Subtheme 3.4: Constant feedback: “the brain and the mind.”** Practitioners choose protocols as they follow client symptoms: “Start with the symptom or the behavior that is most obvious; that’s going to be the brain’s way of talking to you, the outsider” (Marian). Protocols are altered in response to specific client feedback every session. Helen describes this process as “a team effort” in which she tells clients, “You and I are going to have to work together here… I
kind of know about neurofeedback but do you know about you? So you’ve got to talk to me about what’s going on.” When receiving client feedback, the practitioner is having “two different conversations” simultaneously with both “the brain and the mind.” For example, if a client reports that he is calmer (the mind), but is having nightmares of killing people (the brain), the practitioner follows what the overaroused brain is saying and institutes more calming protocols (Gaylen). Lastly, participants agreed that effective neurofeedback treatment involves art or tuition as well as science. “Intuitive sensing” (Charles) and a “sense of timing” (Sarah) help the practitioner to “apply the model in a sensitive way for the individual” (Helen).

Subtheme 3.5: Negative effects. Although potentially “scary” for both the client and the practitioner, negative reactions may indicate that neurofeedback results are not merely “placebo effect,” as some detractors claim. They can actually increase client hope in the process.

Even when we move people in the wrong direction...even when we mess up their sleep or give them a headache or something...that gets people’s attention...because the biggest fear is really that this is a scam you’re wasting my time and when we do something strong even if it’s the wrong thing it’s like ok this actually works because after all what is people’s experience with medicines? They just as often mess you up as help you...this is strong stuff and if I get the right strong stuff this may help me. (Helen)

Subtheme 3.6: Consultation and referral sources: “I don’t know it all!” All participants emphasized the importance of consulting with colleagues. The statement, “I don’t know it all!” spoken by a practitioner with over 31 years of mental health experience and over 15 years of neurofeedback experience, exemplifies the importance placed on consultation.

Subtheme 3.7: Counseling: “Who am I now?” Counseling and neurofeedback complement each other. Some likened counseling trauma survivors without neurofeedback to
"doing surgery without anesthesia." Gaylen will not counsel trauma survivors without neurofeedback as a calming component. Particularly with complex trauma survivors, the counseling process can be hindered by transference reactions of fear, rage, and shame, accompanied by therapist countertransference. Neurofeedback provides the "transference cure" by "quieting fear" in the limbic system so that the client can discuss trauma without disregulating the neurological system. Neurofeedback helps to protect the therapist from vicarious trauma.

Neurofeedback calms the trauma survivor’s anxious neurological system, and counseling assists in processing the changes that neurofeedback may effect in every domain. Since “whole identities may be built around affect,” as affect symptoms drop away, the question of identity comes to the forefront. Clients may begin to ask themselves, “Who am I? If I am not this terrified raging shame-based person, who am I?” (Gaylen). In neuroscience terms, neurofeedback calms the brain and makes it more flexible. Talking within the counseling relationship helps to move the traumatic experience from the more emotional right brain to the more linear, rational left brain, so that the client can be “done with” the trauma. The client goes back and forth between the emotion regulation that neurofeedback provides and the talking in the counseling relationship that assists the client in the identity transformation as affect symptoms drop away.

Theme 4: Client factors

Neurofeedback clients are generally “miserable,” have “tried everything else,” and then try neurofeedback as a “last resort.” In addition to nutrition, allergies, toxins, and parasitic infections, participants identified the following client factors as potentially affecting treatment outcomes.

Subtheme 4.1: Motivation. Client motivation, described by Sarah as “You gotta have a want to,” is foundational. Even if motivated at the beginning of treatment, clients need
“fortitude” to stay with the process sometimes over significant periods of time. Moreover, clients must be willing to process and overcome fear of health.

**Subtheme 4.2: Family system.** A psychologically toxic environment will likely interfere with treatment outcomes. If a client is a “designated patient” that is “holding the family together,” if the family does not want to “lose their scapegoat,” or if a client has an unstable or abusive home life, neurofeedback effects will likely be diminished.

**Subtheme 4.3: Multicultural factors.** All ten participants maintained that, since neurofeedback is not as “culturally loaded” as traditional talk therapy, it tends to cross racial and ethnic boundaries well. Participants specifically noted that “age is not a factor,” as they have successfully treated clients ranging from 3 months to 96 years. Although more women than men come for neurofeedback, both respond well. The one multicultural factor that does affect the process is socioeconomic status. A client must have sufficient financial resources to enter neurofeedback treatment initially and to stay engaged over time.

**Theme 5: External factors**

External factors are defined as factors outside the therapist, the client, and the therapeutic process that practitioners identified as influencing neurofeedback treatment outcomes.

**Subtheme 5.1: The neurofeedback field.** Participants described the neurofeedback field as being “cutting edge,” “growing exponentially,” “up and coming,” and having “endless possibilities.” They were enthusiastic about research published in professional journals as well as recent publicity on radio broadcasts, the *New York Times*, and other public forums. Acceptance of neurofeedback as a viable treatment option may be reaching a “critical mass,” particularly as people become concerned with medication side effects, especially in children.
All publicity is not positive, however. Since neurofeedback is a relatively new field whose professional identity is unclear, a credentialing process has not been standardized. As a result there are “a lot of quacks out there” who may bring bad publicity to the field at a time that it is struggling to earn its place in the mainstream. Both good and bad publicity potentially affect client confidence as well as neurofeedback credibility with medical professionals.

**Subtheme 5.2: The medical field.** The medical field was also viewed as exerting both a positive and negative influence on neurofeedback outcomes. On the positive side, psychiatrists and other medical professionals are beginning to attend trainings, refer clients, and coordinate treatment with neurofeedback providers. Increased acceptance by medical professionals moves neurofeedback out of the “fringe” and “experimental” realm to a more respected place in the mainstream. This acceptance may encourage clients to initiate and to stay with the process.

On the other hand, the medical field was also viewed as perpetuating the overall “culture of medication” that encourages people to “take a pill and be fixed.” Clients with this mentality are less likely to invest the time and finances necessary for successful neurofeedback treatment. Those who do seek neurofeedback are sometimes discouraged by physicians who tell them that they are “wasting their money” on a “ridiculous” treatment that “won’t do anything.” Some clients resist physician negativity, some change physicians, but others drop out of treatment.

**Subtheme 5.3: Insurance policies.** Closely related to the medical field are insurance policies that sometimes prohibit reimbursement for neurofeedback services. Clients lacking the financial means to initiate or continue the process are excluded from its positive effects.

**Discussion**

Findings of this study indicate that the practitioner is central to neurofeedback treatment outcomes with trauma survivors. Other themes included the therapeutic process, the
neurofeedback process, client factors, and external factors. A comparison of these findings with existent literature follows.

The therapist has been the focus of numerous studies, as research has indicated that therapist competence is crucial for successful results (Ronnestad & Skovholt, 2003). Jennings and Skovholt (1999) described cognitive, emotional, and relational (CER) characteristics of master therapists that constitute a three legged stool of expertise. In the cognitive domain master therapists are voracious learners, use experience as a major resource, and value “cognitive complexity and the ambiguity of the human condition” (p. 6). In the emotional domain they are “self-aware, reflective, nondefensive, and open to feedback” as well as “mentally healthy and mature individuals” (p. 7) who take care of themselves. In the relational domain they value the importance of the therapeutic alliance and are comfortable with clients’ intense emotions.

Consistent with the findings of Jennings and Skovholt (1999), in the cognitive domain participants in this study were lifelong learners “always looking” for better treatment options. They valued reflexive experience and embraced complexity in looking “outside the box” for root causes. In the emotional domain they were receptive both to client feedback and to colleague consultation. Many maintained their own mental health by engaging in neurofeedback training and other self-care activities. In the relational domain they valued the therapeutic alliance as an essential overarching piece of the neurofeedback process. They emphasized listening, caring for clients, processing fears and being “unflappable” in the face of client emotions. It would seem that effective neurofeedback practitioners, despite the addition of technological equipment to the therapeutic process, are master therapists as well as neurofeedback specialists.

Wounded healers are individuals whose personal experience of suffering is transformed into a constructive healing force for fellow sufferers. The theme of the wounded healer is found
in literature across time and cultures, and in both the medical and mental health literature (Jackson, 2001). It surfaces in this study as seven of the ten participants alluded to their own personal journeys through various forms of emotional trauma or physical illness or both. Perhaps one participant’s comment best describes the wounded healer: “We try it on ourselves first, and then what works, we pass along.”

Asay and Lambert (1999) estimated that 15% of treatment outcome is due to expectancy or placebo effects, sometimes called the hope factor. Participants engender client hope through their office atmosphere, through staying calm in unexpected client reactions, and in generally “being there” for clients in a strong therapeutic relationship. Even negative effects may actually increase hope that the neurofeedback is working. David unabashedly stated, “Placebo works!”

Results of this study indicated that the therapeutic alliance is an essential ingredient to positive neurofeedback outcomes as it is crucial to successful psychotherapy (Horvath & Symonds, 1991; Sexton & Whiston, 1994). According to the common factors model, 30% of client improvement depends on the therapeutic alliance (Asay & Lambert, 1999). Although this study did not seek to quantify the amount of influence the therapeutic alliance exerts on treatment outcomes, participants were clear that the therapeutic relationship is important.

Findings in this study differed from the common factors model (Asay & Lambert, 1999) in several ways. According to Asay and Lambert (1999), only 15% of psychotherapy outcomes are derived from actual techniques, which are more or less interchangeable. In contrast to these findings, participants in this study emphasized the necessity of having a “big bag of tools” and “a whole array in my armament to help people.” For the most part, participants viewed the ability to change neurofeedback treatment protocols as an essential ingredient in successful outcomes. In addition, findings of this study emphasize the therapist as being central to the process, in
contrast to the Asay and Lambert (1999) model that de-emphasizes the therapist role. It may be that since neurofeedback therapy requires more technological knowledge, the therapist is more central to the neurofeedback process than to the psychotherapy process.

Research participants in this study concurred that client factors as well as therapist factors contribute to treatment outcomes. Asay and Lambert (1999) assert that as much as 40% of client improvement derives from extratherapeutic factors related to the client. These client factors may include the nature of the problem, motivation, ability to relate, ego strength, and family and social support. Participants in this study identified motivation, the family system, and the nature of the problem as potential client factors that contribute to treatment outcomes.

The perception of the research participants that multicultural factors exert little or no influence on neurofeedback treatment outcomes, with the exception of socioeconomic status, is congruent with the neurofeedback literature. Although few specifically multicultural studies exist, one study has indicated that neurofeedback can be adjusted in a culturally sensitive manner with positive treatment outcomes in a Native American population (Kelley, 1997). Studies have also indicated successful neurofeedback results with groups composed of both males and females and those representing a range of ages (Scott, Kaiser, Othmer, & Sideroff, 2005). Drawing from the responses of the study participants as well as from neurofeedback research, it seems that neurofeedback may be a treatment option in a wide range of cultural situations. The challenge is creating a conduit for neurofeedback services to be brought to these diverse populations.

Limitations

Several limitations to the findings of this study should be noted. Since snowball sampling seeks information-rich informants rather than a representative participant sample, the findings of this study cannot be generalized beyond this group, and the voices of some highly
regarded practitioners may have been excluded. Furthermore, the lack of diversity in the participant sample may have skewed themes in ways unknown at this time. Lastly, this article is a condensed version of a larger study. Due to its condensed form, participant profiles and other information that would have provided a fuller context for the themes could not be included.

**Implications**

The results of this research study have several implications for counselors and counselor educators. First, although none of the neurofeedback practitioners in this study advertise themselves as specializing in trauma, between 25% and 95% of their clients have some form of trauma as an underlying issue, with 65% being the median. With such a significant portion of clients being trauma survivors, it would seem that CACREP has made a strategic decision to improve counselor competence by incorporating trauma education into the counseling curriculum (CACREP, 2009).

Secondly, several practitioners highlighted the fact that clients may engage in psychotherapy for years with minimal improvement because the root cause of the difficulty is actually an undiagnosed head trauma or an underlying infection. Teaching on the impact of physical root causes of mental disorders, instruction on how to conduct a holistic assessment, as well as on appropriate referral sources could be a beneficial component to counseling education.

Lastly, since findings from this study indicate that neurofeedback may be an effective complement to counseling with trauma survivors, it would be beneficial for counselors to be familiar with this treatment option, whether or not they decide to incorporate neurofeedback into their practices. Being knowledgeable about the manner in which a counselor and a neurofeedback practitioner can work together may hold significant potential for increasing positive client outcomes. Some counselor education programs have begun offering a track that
leads to biofeedback and neurofeedback certification by the Biofeedback Certification International Alliance (BCIA). More universities could consider offering this track.

Future Research

The findings of this study indicate that neurofeedback is an effective treatment modality for trauma symptoms and that the neurofeedback practitioner plays a central role in treatment outcomes. Future research may expand on the themes highlighted in this study.

Since the themes in this study were drawn exclusively from the practitioner’s point of view, the central role of the practitioner may be overemphasized and the importance of client factors may be underemphasized. A future qualitative study from the trauma survivor’s perspective might provide a more balanced view of the process.

One study participant suggested that more research could be completed in the neurofeedback field to specifically answer the question, “When Neurofeedback doesn’t work, why doesn’t it work?” In addition, studies comparing treatment protocols for all the various types of trauma would add to the body of research already in existence.

One salient characteristic of the effective therapists in this study was the value that they placed on continuing education and “always looking” for better treatment options. Further research may provide more understanding of the development of master therapists and effective neurofeedback practitioners. Is there a way to more effectively inspire this motivation for excellence within our counseling training programs and beyond?

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doi:10.1016/S1056-4993(03)00003-8


May 13, 2010

Proposal Number __200902126__

Professor Remley:

Your proposal submission titled, "The Experiences and Perceptions of Neurofeedback Practitioners Considered to be Effective in Treating Trauma: A Grounded Theory Exploration" has been deemed EXEMPT by the Human Subjects Review Committee of the Darden College of Education. If any changes occur, especially methodological, notify the Chair of the DCOE HSRC, and supply any required addenda requested of you by the Chair. You may begin your research.

We have approved your request to pursue this proposal indefinitely, provided no modifications occur. Also note that if you are funded externally for this project in the future, you will likely have to submit to the University IRB for their approval as well.

PRIOR TO THE START OF YOUR STUDY, you must send a signed and dated hardcopy of your exemption application submission to the address below.

Thank you.

Edwin Gómez, Ph.D.
Associate Professor
Chair, Human Subjects Review Committee, DCOE
Human Movement Studies Department
Old Dominion University
2010 Student Recreation Center
Norfolk, VA 23529-0196
757-683-6309 (ph)
757-683-4270 (fx)
Appendix B

Letter to Neurofeedback Providers for Nomination Process

Dear neurofeedback provider:

I am a PhD candidate in counseling at Old Dominion University in Norfolk, Virginia. For my dissertation, I am researching the factors and processes that contribute to positive outcomes when neurofeedback is used on individuals with trauma symptoms. In order to complete this study, I am looking for well-known, expert neurofeedback providers whom I could interview, and I would like your help in identifying these practitioners. Any information that you provide will be kept confidential. Could you please help me by providing the following information:

To whom (other than yourself) would you most likely and comfortably refer a person—particularly a close acquaintance, friend, or relative—for neurofeedback services? In other words, based on your knowledge of that person’s work, who would you consider to be especially effective in providing neurofeedback services?

Could you please provide 3 to 5 names of neurofeedback providers who practice on the East Coast of the United States, particularly in the states of Virginia, Maryland, North Carolina, Pennsylvania, and/or Washington, D.C., to whom you would refer a person for neurofeedback services, based on their reputation and expertise?

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If you can, please provide 1 or 2 names of neurofeedback providers who practice anywhere else, to whom you would refer a person for neurofeedback services, based on their reputation and expertise:

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If you have further questions, you may contact me by phone at (757) 287-9368 or by email at ccurr012@odu.edu. If you prefer, you may contact my Dissertation Chair, Dr. Ted Remley, at Old Dominion University by phone at (757) 683-6695 or by email at tremley@odu.edu. Thank you very much for your help in this study.

Best regards,

Christine L. Currie, MA, LPC, NCC
PhD Candidate, Graduate Teaching Assistant
Old Dominion University
Norfolk, VA 23529
(757) 287-9368
curr012@odu.edu
Appendix C

Letter to Neurofeedback Providers: Request to Participate in Study

Dear _______________

Based on your reputation and expertise in providing neurofeedback services, other neurofeedback providers have suggested that you would be an ideal candidate for in-depth, confidential interviews that I will be conducting for my dissertation research. I am a Ph.D. candidate in Counseling at Old Dominion University in Norfolk, Virginia. My qualitative dissertation study involves learning more about the factors and processes that contribute to positive outcomes when neurofeedback is sued on individuals with trauma symptoms. I will interview approximately 5 to 10 neurofeedback providers in order to explore their experiences and perceptions on this topic.

I hope that you will participate in this study. As a neurofeedback provider who has been effective in working in the field, the insights you share will be invaluable to other practitioners. In addition, I hope that the information that I gather through these interviews will provide a potential model for factors and processes that may potentially increase the effectiveness of neurofeedback, particularly on a variety of trauma symptoms.

In order to provide some consistency among the interviews, I am attempting to schedule them within the next 4 to 6 weeks, if possible. In order to accomplish this goal, I will do everything possible to meet with you at your convenience, whether inside or outside of normal working hours.

I will plan to call you sometime next week concerning this research project. However, if you have any questions before then, please call me at (757) 287-9368 (day and evening number), or email me at ccurr012@odu.edu. If you prefer, you could call my Dissertation Chair, Dr. Ted Remley, Old Dominion University, at (757) 683-6695, or email him at tremley@odu.edu. Thank you for your consideration. I look forward to speaking with you soon.

Sincerely,

Christine L. Currie, MA, LPC, NCC
Ph.D. Candidate
Graduate Teaching Assistant
Old Dominion University
Norfolk, VA
(757) 287-9368
ccurr012@odu.edu
Appendix D

Informed Consent

Title:
FACTORS AND PROCESSES THAT CONTRIBUTE TO POSITIVE OUTCOMES USING NEUROFEEDBACK ON INDIVIDUALS WITH TRAUMA SYMPTOMS: A GROUNDED THEORY EXPLORATION

Introduction:
My name is Christine Currie, and I am the researcher for this study. I have a Masters degree in Counseling, am a Licensed Professional Counselor in the state of Virginia, and am currently pursuing a Ph.D. in Counselor Education and Supervision at Old Dominion University. This research project will be used for my dissertation, and is being supervised by Dr. Ted Remley, Chair of the Department of Counseling and Human Services. In this form, I will provide you with information that will help you decide whether you would like to participate in this research project or not.

Criteria for Participation:
Based on your reputation and expertise in providing neurofeedback services, other neurofeedback providers have suggested that you would be an ideal candidate for in-depth, confidential interviews. In order to participate in this study, you must be a licensed mental health professional, licensed medical professional, or hold a certification in biofeedback. In addition, you must be currently utilizing neurofeedback as a treatment modality.

Description of the study:
Some form of traumatic experience is frequently an underlying factor in mental health issues such as depression, anxiety, substance abuse, self-destructive behaviors, relationship problems, and somatic symptoms (Courtois, 2008). Neuroscience research has indicated that the experience of trauma can alter the manner in which the human brain receives and processes information (Van der Kolk, 2006; Wolf, et.al., 2009). Although there have been numerous quantitative studies that have utilized a pre-test and post-test format, in order to investigate the effectiveness of neurofeedback on various disorders, there have been no qualitative studies exploring the perceptions and experiences of neurofeedback practitioners concerning what factors and processes may be important in achieving positive treatment outcomes.

The purpose of this study is to learn more about the experiences and perceptions of neurofeedback providers who are considered by their peers to be effective in providing neurofeedback services, particularly in the treatment of clients who have experienced some type of trauma. I plan to interview 5 to 10 practitioners, for the purpose of identifying common themes and describing a potential model for factors that tend to increase the effectiveness of neurofeedback, particularly on trauma symptoms.

The collection and analysis of data are projected to occur between September, 2010 and March, 2011. If you agree to participate in this study, you will be asked to complete an initial face-to-face interview lasting approximately 1 hour, a follow-up interview that may be completed over the telephone, and a third contact via email, to provide additional information, and to confirm
themes from previous interviews. You will also be asked to complete a Demographic Information Form, sign a Consent to Record your interviews, and to read and sign this Informed Consent. You will also be asked to provide a resume or curriculum vitae, if you have one available, as well as any information, such as an informed consent, brochures, or other printed material that you typically give to clients.

Confidentiality:
The information that you provide through the interviews and Demographic Information Form is confidential. I will record your interviews, to ensure that your observations and experiences are obtained in your own words, and to ensure accuracy. Interviews will be transcribed either by me or by a professional transcriptionist, and all identifying information will be deleted in the transcript. Transcriptions of the interviews will contain a randomly selected participant identification code, known only to me, so that you cannot be identified. The documents that you sign will be kept in a secure file cabinet. All electronic communication and other confidential information will be stored on a password protected computer. After the transcriptions are complete and checked for accuracy, I will delete the interview recordings. When this study is complete, I will destroy all forms that contain identifying information. I will continue to safeguard your confidentiality after the research is completed. Research findings may be presented at professional conferences and/or scholarly journals, but no identifying information will be used.

Risks and Benefits:
There are no foreseeable risks for participating in this research. During the interviews, you will be asked to answer a series of questions. You may refuse to answer any questions that you do not wish to answer, and you may terminate participation at any time without penalty. The results of this study may add to the body of research on neurofeedback, and may be released to the public. Therefore, you may benefit from a sense of having helped neurofeedback practitioners learn more about factors that increase the effectiveness of their services, thereby also helping clients receive improved services. You may contact the primary researcher at the below listed email address for any resultant publications related to this research.

Withdrawal Privilege and Payments:
There is no cost to you, nor any compensation for your participation. You do not have to participate in this study. You can choose to withdraw at any time. Even if you agree to participate and then later change your mind, there will be no negative consequences.

If you have any questions at any point during or after this study, you may contact Dr. Ted Remley at Old Dominion University at (757) 683-6695, or by email at tremley@odu.edu. Please feel free to send correspondence to Old Dominion University, 110 Education Building, Norfolk, VA 23529. You may also contact the IRB chair, George Maihafer, at anytime at (757) 683-4520, or by email at gmaihafe@odu.edu.
By signing below, you agree that you have read and understand the explanation provided and voluntarily agree to participate in this study.

______________________________
Participant name (printed)

__________________________  _____________
Participant signature       Date

__________________________  _____________
Researcher signature       Date

Christine L. Currie, MA, LPC, NCC
Doctoral Candidate
Old Dominion University
Department of Counseling and Human Services
(757) 287-9368
ccurr012@odu.edu
Appendix E

Consent to Record Form

Consent to Record

I, ________________________________, give my permission for Christine Currie to conduct and record interviews with me in connection with her dissertation project. The interviews will be taped simply to ensure that participants’ observations and experiences are obtained as much as possible in their own words, and to ensure accuracy.

Recordings will be transcribed either by Christine or by a professional transcriptionist. All identifying information will be deleted, and a participant identification code will be used. Recordings will be destroyed after being transcribed, and after verifying that the transcription is accurate.

I also understand that interview recordings—identified by a participant identification code only—may be listened to by Christine’s Dissertation Chair, Dr. Ted Remley, at Old Dominion University, in order to give Christine feedback concerning interview data.

Signed: __________________________________________

Participant 

Date

Signed: __________________________________________

Researcher 

Date
Appendix F

Demographics Inventory

Neurofeedback Provider Demographic Information

This form will be kept in a secure file by the researcher. Any information derived from it, for use in this dissertation project or related publication(s), will be identified by a participant identification code only, in order to preserve your confidentiality.

I. General Information:

A. Name: __________________________________________

B. Name of practice __________________________________________

C. Practice Address: _______________________________________

D. Phone number:________ Email address: _______________________

II. Educational Background:

A. In what field is your degree?  □ Counseling  □ Psychology  □ Social Work
   □ Psychiatry □ Other (please specify): __________________________

B. Highest degree completed: □ Masters □ Doctorate □ Other (please specify):_____
   □ Degree in progress (please specify): __________________________
C. Please list any licenses, certifications, or other special training that you have, and when you received/completed them:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

III. Professional Experience:

A. Number of years in neurofeedback practice: _________________________________

B. With which organization were you trained? _________________________________

C. In addition to neurofeedback, do you also provide counseling/therapy services in your practice?  □ Yes  □ No

D. If so, how many years have you been doing counseling/therapy? _____________

IV. Client information:

A. Approximately how many clients have you seen per week, during this past year? _________________________________

B. If possible, could you please give an estimate of the percentage of your clients with the following presenting problems:

Depression _____ %  Anxiety _____ %  Autism spectrum _____ %
Attention Deficit/Hyperactivity Disorder _____ %  Bipolar disorder _____ %
Chronic fatigue/fibromyalgia _____ %  Sleep problems _____ %
Headaches/migraines _____ %  Traumatic Brain Injury _____ %
Other common presenting problems: ___________________________________________
C. What is the estimated percentage of your clients in which some form of trauma is a central issue: ______%  
[Including, but not limited to: Childhood abuse (physical, verbal, sexual), rape/sexual assault, domestic violence, combat experience, attachment traumas, physical injuries (accidents, etc.) to self or a loved one, etc.]

_Please include any additional comments here, or on the back of this form, if needed:_

_Thank you very much for your participation in this research project!_
Appendix G

Interview Protocol

The initial interview question will be broad and general, in order to allow potentially unanticipated themes to emerge. Subquestions will be more specific. In addition, the interview protocol may be altered, if themes emerge that need further exploration, or if the participant discusses subquestions in the initial question.

I. Initial procedures:

A. Restate purpose of the study: You have been nominated by your peers as someone who is effective in providing neurofeedback services. I would like to explore your experiences and perceptions as a neurofeedback provider concerning the factors and processes that contribute to positive treatment outcomes when neurofeedback is used on individuals with trauma symptoms. Some form of traumatic experience is frequently an underlying factor in mental health issues such as depression, anxiety, substance abuse, self-destructive behaviors, relationship problems, and somatic symptoms. For this study, a wide definition of trauma will be used, which includes both the DSM-IV-TR criteria for posttraumatic stress disorder and the 7 symptoms associated with complex trauma (Courtois, 2008; Herman, 1992).

B. Make sure forms are signed:

- Consent to Record interview
- Informed Consent

C. Ask for (if not obtained already):

- Completed Demographic Information Form
- Resume/curriculum vitae (if available)
- Brochures or materials which they typically give clients or use to describe their services; professional disclosure statement; articles, etc.
Interview Protocol

Follow up on the Demographic Information Form:

Is there any information that was not included on the Provider Demographic information form, that you would like to add?

Opening questions:

1. How did you first hear about neurofeedback?
   a. What were your first impressions of neurofeedback?

2. What made you decide to set up a practice using neurofeedback, or to incorporate neurofeedback into your existing practice?
   a. Is there anyone or anything in particular that influenced you or helped you

3. What was it like when you first started using neurofeedback in your practice
   a. How is your practice different now from when you started?

4. Tell me what a typical day looks like for you in your practice.
   a. Describe the typical clients who come to you for neurofeedback.

Central Interview Questions

You have been nominated by your peers as being effective in using neurofeedback to treat clients.

5. In your opinion, what factors have contributed to positive treatment outcomes when using neurofeedback in general? (factors: for example, personal, therapeutic, professional, therapeutic alliance, etc.)
   a. In your opinion, what factors have contributed to positive treatment outcomes in using neurofeedback on clients with trauma symptoms?
   b. Are there any factors that have been obstacles to successful treatment?
   c. How might multicultural factors contribute to positive or negative treatment outcomes?
(for example, gender, race, ethnicity, age, sexual orientation)

d. In your opinion, what factors distinguish an expert neurofeedback provider from a
good provider, especially in treating individuals with trauma symptoms?

6. In your opinion, what part does years of experience play in a provider’s expertise?

7. Now I would like to know more about the process of providing neurofeedback to clients
who have experienced some type of trauma.

   a. What types of symptoms have you noticed in clients who have experienced trauma?
   
   b. Now that you’ve talked about _____, are there any additional symptoms? (Show list
      of PTSD symptoms and complex trauma symptoms)
   
   c. Tell me about the process of treating those symptoms.
   
   d. I’m wondering what differences you notice in treating clients who have experienced
      trauma, and those who haven’t?
   
   e. Are there any differences in your responses or feelings in treating these clients?

8. Now I’d like to ask you more about actual treatment. In general, how do you go about
treating trauma symptoms?

   a. I would like to hear about your experience treating a client with trauma symptoms,
      when the client seemed to be helped significantly.
   
   b. How did you know the client was helped?
   
   c. Now I would like to hear about an experience treating a client with trauma symptoms,
      when the client was helped very little, or not at all.
   
   d. How did you know that the client was not helped?
   
   e. In your opinion, what factors or processes contributed to the difference in the outcomes
      between the two clients?
Follow-up questions (for telephone interview):

9. What have been the most important lessons that you have learned through your years of practice?
   a. I would like to know about any critical incidents or circumstances that you have experienced, incidents that changed your views, or challenged you to do things a bit differently.

10. You’ve told me some factors, processes, and treatments that contribute to positive treatment outcomes. I’m wondering if you can narrow it down a bit. If you had to choose one thing that makes you successful in treating clients with trauma symptoms, what would it be?

11. In your opinion, how much of neurofeedback training is art versus science?

12. What have you noticed while treating clients with trauma symptoms, when neurofeedback is combined with counseling or some other treatment modality?

13. Tell me about your experiences using the alpha-theta protocol. (If not already discussed)

Personal reflection questions:

14. I’m wondering how you balance your professional practice with your personal life.
   a. Do you ever take your clients home with you? (not physically but mentally and emotionally)

15. After having these experiences, what advice would you give to someone who wants to begin using neurofeedback as a treatment modality, particularly with those who have experienced trauma?
16. I’d like to know what you think about the future of neurofeedback, both personally and professionally.
   a. Where do you see yourself in two years? Five years? Ten years?
   b. How will you be different then, both personally and professionally, from now?

17. Talk about the future of neurofeedback.
   a. What are your thoughts about the future of neurofeedback?
   b. What are your hopes for the future of neurofeedback?

Email questions:

18. Is there anything else that you would like to tell me about your experiences with neurofeedback?

19. If you could do it all over again (in terms of your mental health/neurofeedback career) what would you do the same?
   a. What would you do differently?
VITAE

Christine L. Currie earned a Bachelor of Arts degree in English in 1973 from Connecticut College, completed teacher certification in 1974 at Millersville University, and earned a Master of Arts in Counseling degree in 2005 from Regent University. She is a licensed professional counselor, a national certified counselor, and has completed training in play therapy, neurofeedback, and Eye Movement Desensitization and Reprocessing (EMDR).

Christine has worked as an English teacher and a mental health professional in an international school in Moscow, Russia. She has also established a private practice both overseas and in the United States.

Christine is an active member of several national professional organizations including the Association for Counselor Education and Supervision (ACES), the American Counseling Association (ACA), and Chi Sigma Iota (CSI). She has presented and co-presented at international, national, regional, and state level conferences on a variety of topics, including trauma impact, assessment, and treatment; attention deficit/hyperactivity disorder; neurofeedback; positive aging; relationships; and communication.