

**MUSIC AS THERAPY FOR VETERANS OF
THE WARS IN IRAQ AND AFGHANISTAN
WITH POST-TRAUMATIC STRESS
DISORDER**

Patrick McGuire
Candidate for Scholastic Distinction
The Juilliard School
New York, NY
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CONTENTS

INTRODUCTION.....	1
PART I: THE INTEGRATION OF MUSIC AND MEDICINE IN THE 20 th CENTURY.....	6
Music in Hospitals During World War II.....	7
Operation Enduring Freedom and Operation Iraqi Freedom: Music and Post-Traumatic Stress Disorder in the 21 st Century.....	11
PART II: ABOUT POST-TRAUMATIC STRESS DISORDER.....	20
Symptoms.....	20
Diagnosis.....	22
The Neurological Response to Trauma.....	23
Prevalence.....	24
Undiagnosed Post-Traumatic Stress Disorder.....	26
PART III: TREATING POST-TRAUMATIC STRESS DISORDER.....	30
Psychotherapy.....	31
Prolonged Exposure Therapy.....	32
Cognitive Processing Therapy.....	33
Eye Movement Desensitization and Reprocessing.....	34
Pharmacotherapy.....	35
Music as Therapy.....	37
The Bonny Method of Guided Imagery and Music.....	43
Drumming in Music Therapy.....	45
Music as Torture.....	48
CONCLUSION.....	54
WORKSHOP PROPOSAL: USING MUSIC TO REGULATE YOUR EMOTIONS.....	56
APPENDIX A: THE BASIC STRUCTURE OF THE BRAIN.....	58
APPENDIX B: SELECTED AUDIO AND VIDEO RECORDINGS BY VETERANS OF THE WARS IN IRAQ AND AFGHANSITAN.....	60
APPENDIX C: SELECTED LIST OF INDEPENDENT READJUSTMENT PROGRAMS.....	63
BIBLIOGRAPHY.....	65

INTRODUCTION

During the night of March 11, 2012, 38-year-old Staff Sergeant Robert Bales walked more than a mile from his military base in southern rural Afghanistan and broke into several homes, shooting and stabbing unarmed civilians. Seventeen Afghan citizens died, including nine children. On March 23rd, he was charged with seventeen counts of premeditated murder and six counts of assault and attempted murder; if convicted, he could face the death penalty.

Staff Sgt. Bales had been in Afghanistan on his fourth deployment starting in December 2011. In Iraq, he lost part of one foot and injured his head. A senior American military official claimed that Bales had been drinking—a violation of military rules in combat zones—and had been dealing with the stresses of being on a fourth combat tour with his wife at home. Bales' lawyers, on the other hand, argued that he had a solid marriage and no drinking problems. They claimed that he was dispatched to a war in which he did not want to fight, had seen a friend seriously wounded shortly before the incident, and probably suffered from post-traumatic stress disorder (PTSD) that had been left undiagnosed by the Army.¹

Post-traumatic stress disorder is a type of anxiety disorder that can develop after a traumatic event outside of the ordinary experience occurs, including military combat, sexual abuse, and natural disaster. People with PTSD can experience traumatic flashbacks, hyperarousal (a state of being constantly alert and edgy), and feelings of

¹ "Robert Bales", New York Times
http://topics.nytimes.com/top/reference/timestopics/people/b/robert_bales/index.html?scp=1-spot&sq=robert%20bales&st=cse# (accessed 1 April 2012).

isolation.² It often goes undiagnosed, especially among those in the military, because of a perceived image of weakness or failure.³ Soldiers in Operation Enduring Freedom and Operation Iraqi Freedom have been known to be re-deployed on several combat tours. For veterans with undiagnosed PTSD feeling isolated from their communities at home, redeployment could mean returning to a community of people who better understand each other and the stresses of war. It could also mean re-opening the wounds of prior trauma.

It is unclear whether post-traumatic stress disorder was a direct factor in the Bales incident. It was certainly unfortunate timing for the U.S. image abroad, though, as the event shortly followed the burning of an undisclosed number of Korans by NATO personnel in February in this already unpopular war.⁴ The case illuminates the immediate and ongoing concern of undiagnosed post-traumatic stress disorder, which not only affects veterans returning from the wars, but also those currently re-deployed who are making split-second decisions that continually shape the American image abroad.

Of the 1 million U.S. soldiers who left active duty between 2002 and 2009, half of those who sought a medical assessment were diagnosed with PTSD, but 54% did not seek a medical assessment from the U.S. Department of Veterans Affairs. Soldiers have reported not seeking a medical assessment because they were concerned about being

² "What is PTSD?", National Center for PTSD <http://www.ptsd.va.gov/public/pages/what-is-ptsd.asp> (accessed 2 April 2012).

³ "Mental Health Effects of Serving in Afghanistan and Iraq", National Center for PTSD <http://www.ptsd.va.gov/public/pages/overview-mental-health-effects.asp> (accessed 31 March 2012).

⁴ Sangar Rahimi, "Koran Burning in NATO Error Incites Afghans," *The New York Times*, no. 21 February 2012. http://www.nytimes.com/2012/02/22/world/asia/nato-commander-apologizes-for-koran-disposal-in-afghanistan.html?_r=1&scp=14&sq=Koran+burnings&st=nyt (accessed 1 April 2012).

viewed as weak, being treated differently, about the side effects of various treatments, and about the cost and accessibility of treatment.⁵ Time has shown that PTSD is a growing issue that is not going to disappear. Because of the social stigma associated with PTSD, hundreds of thousands of veterans are not seeking medical assessments and continue to relive the traumas of war in isolation. Offering these veterans with cost-effective alternatives that do not publicly expose them is essential. Music is one resource that can help veterans with PTSD control their symptoms, and modern telemedicine⁶ capabilities makes educating veterans about using music therapeutically available to larger populations.

Music therapy has been used for decades to treat Parkinson's disease⁷, Tourette's syndrome⁸, and aphasia.⁹ There has also been a significant amount of research done on

⁵ "Mental Health Effects of Serving in Afghanistan and Iraq".

⁶ Telemedicine is a medical practice where the doctor and patient are in two separate locations connected by video through computer or satellite (*Telemedicine*. Merriam-Webster, 2012).

⁷ As Oliver Sacks describes in *Musicophilia*, Parkinson's disease can affect both movement and time perception. Some patients with Parkinson's have trouble maintaining a flow of perception, thought, and feeling. Others move much faster or slower than what feels to them like normal time and cannot perceive the differences until they compare themselves to a clock or other people. In his 2004 *New Yorker* article "Speed," Sacks compares this acceleration and slowing down of time to photographing plants and animals. Looking at photographs of a plant opening and closing over an entire day accelerates time, while looking at photographs of a bird flapping its wings slows down time. For many people with Parkinson's disease, music unifies psychological time with clock time.

The composer Elliott Carter discusses the relationship between clock time and psychological time in music in his essay "Music and the Time Screen." Psychological times for Carter are individual experiences based on one's life pattern. They are times of existence, including those of anxiety, sorrow, fear, and happiness. Carter began to explore the potential relationships between clock time and psychological time in his *Cello Sonata* of 1948, where in the opening the piano maintains steady clock time while the cello simultaneously sings a melody in a seemingly free and separate psychological time. He explores the idea further with metric modulations. For example, twelve sixteenth-notes grouped into three beats of four could be suddenly regrouped into four beats of three. Though the twelve sixteenth-notes will last the same amount of clock time, the pulse and perceived psychological time suddenly accelerates.

⁸ In *Musicophilia*, Oliver Sacks describes an experience he had in New York while observing Matt Giordano's drum circle known as Drum Echoes. Giordano found that drumming was the best way for him to exert his energy and control the tics he had resulting from severe Tourette's syndrome. He started Drum Echoes as a way to share this experience with other people with Tourette's syndrome. As Sacks

the effectiveness of music therapy in treating anxiety and depression. Several recent studies have shown that veterans with PTSD can also use music therapeutically to control symptoms of hyperarousal, feelings of isolation, and traumatic flashbacks.¹⁰ Music therapy can be beneficial for those veterans who do seek treatment, but being trained in music therapy is a significant time and financial commitment that not all musicians are willing to make. Music can be a powerful and transformative tool, and while the research and work that music therapy researchers and practitioners do is essential for the development of the field, there is an abundance of musical talent underutilized therapeutically. With an understanding of how music can be used effectively to treat and prevent symptoms of post-traumatic stress disorder, any conservatory-trained musician is capable of contributing.

The purpose of this document is to identify how professional musicians can contribute to the field by examining how music therapy works in relation to psychotherapy and pharmacotherapy, the two major treatments recommended by the

observed, "...everyone in the room that day seemed to be ticking, ticking in their own time. I could see eruptions of tics, contagions of tics, rippling around the thirty-odd Touretters there—but once the drum circle started, with Matt leading them, all the ticking disappeared within seconds. Suddenly there was synchronization, and they came together as a group... (*Musicophilia*, 250)." For these people, music is helps to control their tics and provides a musical and social bonding experience.

⁹ Aphasia is the inability to speak. In *Musicophilia*, Oliver Sacks describes the case of Samuel S., a patient at Beth Abraham Hospital with severe expressive aphasia. Samuel suffered from a stroke in his late sixties, and remained speechless two years later despite intensive speech therapy. His case was considered hopeless until music therapist Connie Tomaino heard him singing the tune to "Ol' Man River," expressively with two or three of the words. Dr. Tomaino met with Samuel three times each week, singing songs with him and accompanying on the accordion. He was quickly able to sing all of the words to "Ol' Man River" and other songs he had grown up with in the 1940s. With this significant improvement, the therapy continued and after two months Samuel was able to briefly respond to questions. When asked how he spent his weekend, he might have responded "Had a great time," or "Saw the kids." Sacks sings "happy birthday" to all of his aphasic patients and almost all are able to join in singing the melody, while half are also able to get the words.

¹⁰ M. Bensimon, Y. Wolf, and D. Amir, "Drumming through Trauma: Music Therapy with Post-Traumatic Soldiers," *Arts in Psychotherapy* 35, no. 1 (2008).

U.S. Department of Veterans Affairs for PTSD. The first section, “Integrating Music and Medicine in the 20th Century,” outlines landmark figures and organizations in the development of music therapy as a professional field, describes the emergence and recognition of post-traumatic stress disorder, and identifies how music and PTSD in war have developed into the 21st Century. The second section, “About Post-Traumatic Stress Disorder,” describes the biological aspects of PTSD and how it differs from traumatic brain injury, identifies the clinical and neurological symptoms, and outlines veteran populations with PTSD along with commonly related issues such as alcoholism, and suicide, and family problems. The third section, “Treating PTSD,” compares the effectiveness and costs of psychotherapy, pharmacotherapy, and music therapy. The final section proposes an hour-long workshop as a model for programs that can be led by any conservatory-trained musician on using music therapeutically. Through the *Music and Medicine Initiative* between The Juilliard School and Weill Cornell Medical Institute, I will be leading hour-long workshops based on this proposal starting in May 2012 on using music as a tool to regulate emotions, which will be broadcasted to units of the U.S. National Guard through telemedicine from the New York Presbyterian Hospital at Weill Cornell Medical Institute.

PART I

THE INTEGRATION OF MUSIC AND MEDICINE IN THE 20TH CENTURY

Music has been an integral part of healing processes throughout history. In ancient Greece, Apollo was considered to be the god of both healing and music. The Greeks believed that music had power over human emotions. Each of the musical modes¹¹ had an individual emotional effect. The Phrygian mode inspired courage, for example, while the Dorian mode was noble and uplifting, and often used to educate the young. Harmony in music was thought to reflect the harmony of the body and the soul. In Native American cultures, music and dance are central to healing ceremonies. Music is not only considered to drive away evil spirits and summon good ones, but is also communicated to a medicine man directly from the gods.¹²

Music is also used today in clinical settings to help patients with various conditions in their recovery. After three men broke into his apartment and set him on fire in 2001, Jeremy Deliotte joined the music therapy program at Beth Abraham Health Services in New York. He wrote songs about how his life was different after the incident, including how people treated him differently, how his priorities had changed, and how his life was still good despite the terrible situation. Playing and listening to his own songs helped in his recovery, and music is now a central part of his life.^{13, 14}

¹¹ A musical mode is a particular organization of whole steps and half steps in a scale. Major and minor scales are both examples of common modes, emotionally distinguishable by the generalized characters of “happy” and “sad.” The most common modes are Ionian (major), Dorian, Phrygian, Lydian, Mixolydian, Aeolian (minor), and Locrian.

¹² *Medicine and Music*, 1977.

¹³ "Jeremy Deliotte", Institute for Music and Neurologic Function <http://www.imnf.org/about-us/readmore/jeremy-deliotte> (accessed 15 April 2012).

Despite the ancient ties between music and healing, music has not always been so integrated with medicine in clinical settings. Though people believed in the healing power of music, there was minimal empirical evidence to support its integration into medical practices. In the 20th Century, though, as soldiers returned from each of the wars abroad, the need arose for more treatment for the invisible emotional scars that accompanied the more apparent physical wounds. As soldiers returned from Europe and Asia after World War II, doctors and patients began to notice the significant effects that music had in recovery, leading to the development of music therapy as a professional field.

Music in Hospitals During World War II

While band musicians had been used during the Civil War to help doctors amputate limbs and carry soldiers off of the field, the U.S. Military did not utilize classical music abroad during World War II. Feeling the need to contribute to the war effort, classical musicians started to play in military hospitals at home. Doctors and nurses noticed significant physical and emotional improvements in the soldiers and began hiring professional musicians to perform regularly in service hospitals. It quickly became apparent that these musicians needed specialized training in order to be most effective for the recovering soldiers. Recognizing the importance of training musicians

¹⁴ Jeremy's experience is similar to that of many war veterans who have learned to effectively deal with post-traumatic symptoms. In his article "Post-Traumatic Stress's Surprisingly Positive Flip Side," Jim Rendon describes how many soldiers are changed for the better after recovering from trauma in a process called post-traumatic growth. A study of more than 600 trauma survivors showed that veterans recovering from post-traumatic symptoms reported a new appreciation for life, improved personal strength, improved relationships, and more spiritual satisfaction. Those who experienced the most extreme traumatic events also reported the most positive changes. It is not the event itself that causes post-traumatic growth, but the process of accepting it and coping with it. Though most reported that they would have preferred that the traumatic event had not occurred, most also reported having undergone a significant positive change because of it (Rendon).

for these offstage performances, the prominent music therapy advocate Willem van de Wall stated:

The time has come when vocational music institutions, like the Curtis, the Juilliard, and the Eastman schools and various conservatories of music, large and small, must give attention to the problem of training music leaders equipped not only as artists but also as personalities and community workers ready to meet the cultural needs of the community.¹⁵

In the decades that followed, van de Wall became one of several individuals to advocate for the continued incorporation of professional musicians in hospitals and for the development of institutional programs to train musicians to qualify for those positions.¹⁶

Originally a professional harpist, Willem van de Wall performed with the Metropolitan Opera Company, the New York Symphony Orchestra (currently the New York Philharmonic Orchestra), and later the United States Marine Band during World War I. After the War, he researched and studied music programs in public institutions at the Russell Sage Foundation and the American Association for Adult Education. During this period, he published several important articles and books, including *Music in Institutions* (1936), *Music of the People* (1938), and *Music in Hospitals* (1946), in which he outlined the structure and function of effective music programs for hospital and prisons.

The psychiatrist Ira M. Altshuler was also important to the development of music therapy, both in theory and in practice. In his publication *A Psychiatrist's Experiences with Music as a Therapeutic Agent*, he explored the connections between musical rhythm and human rhythm, including respiration, heartbeat, speech, and brain

¹⁵ Andrew Krinkun, "Community Music During the New Deal: The Contributions of Willem van de Wall and Max Kaplan," *International Journal of Community Music* 3, no. 2 (2010): 24.

¹⁶ Ibid.

waves. Altshuler ventured so far as to modify the 17th-Century French philosopher Descartes' famous remark, "I think, therefore I exist," to "I rhythm, therefore I exist." He proposed an "iso principle" of music, which related the effects of musical rhythm on the body's natural rhythms and mental states.¹⁷ In addition to this work, he taught music therapy for thirty years at Michigan State University, which had the first college-level program in music therapy.¹⁸

Music was valued in all phases of the Army's Reconditioning Program after the establishment of its psychiatric reconditioning program in 1944. The Reconditioning Program classified musical reconditioning into active participation, passive participation, and audio-reception. In active participation, the most beneficial type of musical therapy, patients made their own music by singing and playing instruments. In passive participation, patients listened to music and discussed it with a therapist. Audio-reception was essentially entertainment music, during which patients listened to music on the radio and in movies, records, and live performance. In addition to the emotional benefits, playing musical instruments was also valued as a type of physical reconditioning. Patients could learn an instrument to strengthen motor skills, and had the option to perform with patients' orchestras for other patients in the hospitals. Additionally, army bands that had assisted on the battlefield in previous wars began performing in service hospitals across the country.¹⁹

¹⁷ Ira M. Altshuler, "A Psychiatrist's Experiences with Music as a Therapeutic Agent," in *Music and Medicine*, ed. Dorothy M. Schullian and Max Schoen (New York: Henry Schuman, Inc., 1948).

¹⁸ "History of Music Therapy", American Music Therapy Association <http://www.musictherapy.org/about/history/> (accessed 29 March 2012).

¹⁹ World War II was the first time that women were able to participate in army bands, resulting from the fact that men were needed to serve both in Europe and in Asia. In May 1942, then President Franklin Delano Roosevelt signed into law that women could serve in the military in auxiliary to men, leading to

To promote and unify the growing population of musicians interested in using music therapeutically after the War, The National Association for Music Therapy (NAMT) was founded in 1950 in New York City. NAMT created the standards for college-level music therapy training programs, and made clinical research a priority. The American Association for Music Therapy was founded in 1971 and was a separate music therapy organization that published its own research journal called *Music Therapy*. It was not until 1998 that the two organizations merged into the American Music Therapy Association (AMTA). AMTA currently has over 5,000 music therapists, publishes research journals, and advocates for music therapy at the state and federal levels.²⁰

The music therapy field has also benefitted from recent technological advances. Magnetic resonance imaging (MRI) detects oxygen levels in the blood, an indirect measurement of blood flow, in particularly active brain areas. Functional magnetic resonance imaging (fMRI) scans individuals while performing various tasks to determine the areas of the brain stimulated during each task. This is particularly useful in linking cognitive action with neurological activity.²¹ For music therapy, this means that areas of the brain activated while listening to music can be identified. More music therapists than ever are being trained at 72 college programs around the country, 33 of

the formation of the Women's Army Auxiliary Corps. By 1944, there were three women's military bands on each coast assigned to military hospitals to boost the morale of wounded soldiers. The Army was initially hesitant to use women in the military (as it was also skeptical of openly homosexual men and women when "Don't Ask Don't Tell" was repealed in 2011), believing that the personality changes brought on by combat would make the injured soldiers "allergic to noncombat soldiers, especially females ones." It was eventually discovered that soldiers were not allergic to women, and that interaction with women was much more beneficial than harmful (Sullivan).

²⁰ "History of Music Therapy".

²¹ Michael S. Gazzaniga, Todd F. Heatherton, and Diane F. Halpern, *Psychological Science*, 3rd ed. (New York: W. W. Norton & Co., 2010).

which offer graduate degrees. Music therapy centers like the Institute of Music and Neurologic Function at Beth Abraham Health Services in New York offer inpatient services and neurological research on the effectiveness of music therapy for various conditions, including Alzheimer's disease, stroke, Parkinson's disease, multiple sclerosis, pain, depression, anxiety, and trauma.

Operation Enduring Freedom and Operation Iraqi Freedom: Music and Post-Traumatic Stress Disorder in the 21st Century

Since the Vietnam War, technological advancements made both music and post-traumatic stress disorder a bigger part of the U.S. military culture abroad than ever before. PTSD was not officially recognized by The American Psychiatric Association (APA) until after the Vietnam War. During World War I, post-traumatic stress disorder was known as "shell shock" before any research on the condition had been done. After the Battle of Marne in 1914, a rumor spread that there were soldiers on the front line standing in military position but "not alive"—soldiers who were noticeably affected but not physically wounded. Doctors originally thought that this state was caused when the brain was violently shaken in the skull, and was therefore a physical rather than mental condition. A diagnosis with this physical condition earned soldiers a wound stripe and a discharge from service. Eventually, though, as shell shock became common even among soldiers who had not been near exploding shells, doctors categorized it as neurasthenia, a weakness of the nerves. Soldiers with shell shock were sent to neurology specialists to recover, and then sent back to the warfront rather than being discharged.²²

²² Caroline Alexander, "The Shock of War," *Smithsonian*, September 2010.

Shell shock came to be known as “battle fatigue” or “war neurosis” during World War II. It was commonly said that “every man has his breaking point.”²³ Then, during the Vietnam War, psychiatrists Chaim Shatan and Robert Jay Lifton proposed new diagnostic criteria for the psychological damage from which soldiers suffered after returning from war. They called it Post-Vietnam Syndrome, and symptoms included apathy, depression, nightmares, and impatience. According to Shatan and Lifton, symptoms could appear months or years after returning from the war. Opening up this diagnosis to veterans of others wars, the American Psychiatric Association (APA) added post-traumatic stress disorder to the third edition of its Diagnostic and Statistical Manual of Mental Disorders (DSM-III). The DSM-III has undergone several revisions, the most recent of which is known as the DSM-IV-TR.²⁴

Jonathan Pieslak, musicologist at the City College of New York and Graduate Center, CUNY, describes in his book *Sound Targets* that music had a substantial presence in Operation Iraqi Freedom both as an inspiration for combat and as a form of soldier expression. Using music to motivate for combat can be traced back to Plato, who believed that music can directly influence behavior. People throughout history have sung and changed battle cries to prepare for battle. In the Revolutionary War, drums and fifes performed both before and after battle. George Washington even considered music such an important part of military culture that, after determining that the drum

²³ Sally Satel, "The Battle Over Battle Fatigue," *The Wall Street Journal* 17 July 2010. <http://online.wsj.com/article/SB10001424052748704913304575371130876271708.html> (accessed 31 March 2012).

²⁴ Ibid.

and five majors did not play well enough, he ordered that they find the skills to become better musicians or lose their wages.²⁵

The invention of the radio in the 20th Century changed the presence of music in war. Soldiers no longer had to make music to hear music. In World War I, music was first heard on the radio to entertain wounded soldiers in military hospitals. Then, in World War II, German military radio stations broadcasted music such as Wagner's "Ride of the Valkyries," to inspire soldiers in combat.²⁶ The Americans during World War II did not use music as an inspirational tool, but rather as a tool to boost morale. The Armed Forces Radio played popular music for soldiers to remind them of home. Later, in Operation Desert Storm, small cassette players made music more portable and more accessible than before.²⁷

More technological advances since the 1990s made music both more of an individual experience and more of a community experience for soldiers in Iraq during Operation Iraqi Freedom. Laptops and individual iPods could be filled with music, and soldiers could listen to music while on patrol. Pieslak reports that almost every soldier he interviewed listened to music before leaving for a patrol, and especially metal or rap. One soldier, Colby Buzzell, described the experience of repeating lyrics repeatedly to get into a specific mindset:

It just gets you ready to go. Because sometimes your motivation is down and you're like, "I don't want to play soldier today, I don't want to do this."

²⁵ Jonathan Pieslak, *Sound Targets* (Bloomington: Indiana University Press, 2009).

²⁶ During the Vietnam War, American soldiers broadcasted music like "Ride of the Valkyries" not to inspire their soldiers, but as a psychological tactic to intimidate the enemy. The U.S. military currently uses popular American and heavy metal music—unfamiliar, loud, and dissonant to those unfamiliar with it—as a torture device in military prisons (Pieslak).

²⁷ Pieslak.

But then you hear “The Good, the Bad, and the Ugly” theme song and you’re like, “Fuck yeah, hell yeah, I’ll go out on a mission today.”²⁸

Buzzell’s account accurately describes the experiences of many soldiers in Iraq, many of which had no experience with metal or rap before the war. Not all soldiers used metal and rap to motivate themselves for combat, though. Ronald Botelho described his experience with music in preparing to gather information about the local Iraqi people:

I listened to a lot of the cultural music to try and get into the rhythm, particularly the rhythm and how people spoke and their body language... If you have an idea of how the language flowed, musically—I think I may have mentioned a couple of Arabic singers, and when I did, people’s face would light up. It’s “Oh, you know something about it, not some stupid American.”²⁹ I would get a little bit more forthrightness from them, a little bit more information. A lot of it is useless, but nonetheless, I would get something. So music in my field helped bridge the gap between knowing nothing and cultural awareness.³⁰

As Botelho’s account demonstrates, not all soldiers used music in Iraq to fire themselves up for their patrols. Some used it to educate themselves about local culture, while others used music to stay alert and concentrated. With music on a patrol, there is less need to maintain a conversation, making it easier for the soldiers to concentrate on their watch.³¹

For the soldiers who did use music as inspiration for combat, it is part of a ritual that psychologically prepares them for combat. The shared experience of that music

²⁸ Ibid., 51.

²⁹ There are several musical programs devoted to this exact idea. The U.S. Department of State has a program called American Music Abroad, through which musical groups representing several American genres are selected to share their music with people of different cultures abroad. The non-profit organization Cultures in Harmony, founded by Juilliard alumnus William Harvey, uses music as a medium to encourage cultural dialogue between Americans and people of other cultures. I will be traveling to Tunisia in July 2012 with Cultures in Harmony as part of their most recent project called “Connecting Cultures Through Counterpoint.”

³⁰ Pieslak, 53.

³¹ Ibid.

enhances the sense of community and common preparation for a common mission. The music creates a group identity, an idea for which soldiers are predisposed from their Basic Combat Training. Running and marching in Basic Combat Training is used to teach teamwork, mission completion, and survival. The musical pre-mission ritual is, in a sense, an extension of that training.³²

Soldiers have also used music as a way to express themselves throughout history. In the Revolutionary War and the Civil War, soldiers wrote songs such as “Yankee Doodle” and “Brave Boys They Are” about the wars. During World War I and World War II, soldiers sang popular songs of the time, such as “Remember Pearl Harbor” and “There’s a Star-Spangled Banner Waving Somewhere.” During World War I, the U.S. Army even issued a songbook with over 70 patriotic and popular songs, with the slogan “A Singing Army is a Fighting Army.” Soldiers during the Vietnam War adapted popular texts to their feelings about the war, often adding political innuendos.³³

Soldiers now compose, perform, and record an unprecedented amount of music while at war. This is possible because musical instruments are more accessible and the technology exists for easier audio production. The music that soldiers write ranges from the music for voice and acoustic guitar to gore metal. Most of the soldiers that Pieslak interviewed reported that their music was an emotional outlet for their experiences at war. Joshua Revak’s album *In the Hours of Darkness* includes songs that he wrote for memorial services while in Iraq. When his close friends were killed, he and his other friends wrote songs to be performed at their memorial services. Another soldier

³² Ibid.

³³ Ibid.

reported writing graphic lyrics for a gore metal song after an experience during which a dead body he was carrying off the battlefield fell into pieces.³⁴

Rap music is a large part of military culture. Soldiers gather in groups and alternate rapping about the war. This is, in many ways, the most easily accessible type of music for soldiers at war because it does not require any musical instruments or training. Also, because of the percussive vocal style, soldiers do not need to be able to sing to be able to rap. This music can be created and performed by more soldiers than music for acoustic guitar or other instruments.³⁵

New technology allows soldiers to record and share their music in easier and faster ways than before. Computer programs such as GarageBand, Fruity Loops, and ACID Pro provide soldiers with easy access to recording platforms on their laptops. Soldiers can record songs on these programs and make albums, several of which have been publicly released, including *Iraq Unplugged*, *Baghdad Music Journal*, and *Live from Iraq*. Neal Saunders describes how his personal transformation in Iraq motivated *Live from Iraq*:

[It] started out as a necessity. It wasn't anything we wanted to do, it was something we felt like we had to do...me personally, like before we were going I'd be like, "You know, hey, if I die in service to my country that's a wonderful thing..." but as soon as we got there and I started seeing how these people are dying, and the ways that they're dying, it's like, "Fuck that, I do not want to die, not like this." It puts you in a situation where that survival mode kicks in. And then it's nothing like what you ever thought it was ever going to be. There's a lot of emotion in that, there's a lot of power in that. And that is really what we wanted to get. And that's really what made me want to do this, because I had one set of beliefs

³⁴ Ibid.

³⁵ Though there are not many classically trained composers in the military, Jason Sagebiel studied classical guitar and composition at the University of New Orleans before his deployment. He was also able to study a small stringed instrument called an 'ud with an Iraqi teacher, another instance of effective and often unrecognized cultural diplomacy (ibid., 117-119.)

before I left and then just as I got there, just everything that I knew constantly changed every day. So it was like an awakening over there for me. Probably after the third or fourth ambush we got in was really bad--in comparison, they're all bad, but the third or fourth, something was a bit more like, "Yes, today might be the day kind of thing." And that's when I was really like, "You know what? Fuck it, we've got to do this album."³⁶

Many soldiers feel that writing and recording their music is necessary for expressing themselves during the war. They are writing and recording songs to express themselves in ways that they would not be doing otherwise.^{37, 38}

Though many soldiers use music during the war and find it useful as a coping and expressive mechanism, increasing amounts of soldiers return home with post-traumatic stress disorder and other readjustment difficulties. As stated in *Invisible Wounds*, "[no] one comes home from war unchanged."³⁹ Because PTSD is a chronic condition, hundreds of thousands of veterans from previous wars are still seriously affected. Soldiers returning from Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF) in Iraq are more likely to develop post-traumatic stress disorder than in previous wars and will continue to add to the numbers.

A meta-analysis published by the PTSD Research Quarterly in 2009 estimated that 180,000-324,000 (10-18%) of the 1.8 million soldiers who had deployed to Iraq or Afghanistan were likely to develop PTSD.⁴⁰ Especially noteworthy were the findings

³⁶ Ibid., 128.

³⁷ Ibid.

³⁸ See Appendix B for a selected list of audio and video recordings of music written by veterans of the wars in Iraq and Afghanistan.

³⁹ Vanessa Williamson and Erin Mulhall, *Invisible Wounds: Psychological and Neurological Injuries Confront a New Generation of Veterans* (Iraq and Afghanistan Veterans of American, 2009), 2.

⁴⁰ Brett T. Litz and William E. Schlenger, "PTSD in Service Members and New Veterans of the Iraq and Afghanistan Wars: A Bibliography and Critique," *PTSD Research Quarterly* 20, no. 1.

published by Miliken et al. in 2007 that 41% of active-duty troops already diagnosed with PTSD were considered to be on a “chronic trajectory” rather than on the road to recovery. Miliken et al. also predicted that 24.5% of the Army Reserve and National Guard would develop PTSD, which is particularly relevant because 40% of Americans deployed in Operation Enduring Freedom and Operation Iraqi Freedom are in the Guard or the Reserve.⁴¹

The research compiled by Litz and Schlenger also shows that soldiers returning from OEF and OIF are more likely to develop PTSD than those in other wars. Factors that contribute to this include longer deployments, more severe combat exposure, more severe physical injuries, traumatic brain injury, not being married, having family problems, and prior exposure to trauma. Additionally, about half of the veterans returning from OEF and OIF have not sought medical assessments from the U.S. Department of Veterans Affairs (VA). One million soldiers left active duty between 2002 and 2009, and 46% sought care at the VA. Of those who sought care, 48% were diagnosed with mental health problems such as PTSD. This leaves 54% of the population returning from OEF and OIF potentially with undiagnosed cases of PTSD and other mental health conditions. Some veterans report not seeking care at the VA so as not to be viewed as weak and not to be treated differently. They do not want others to lose confidence in them and have privacy concerns and concerns about the side effects, access, cost, and location of treatment.⁴²

⁴¹ C. S. Miliken, J.L. Auchterlonie, and C.W. Hoge, "Longitudinal Assessment of Mental Health Problems Among Active and Reserve Component Soldiers Returning from the Iraq War," *Journal of the American Medicine Association* 298, (2007).

⁴² "Mental Health Effects of Serving in Afghanistan and Iraq".

For these reasons, many soldiers do not seek treatment and remain undiagnosed, which can be hurtful to the veterans, their families, and their communities. Because a large percentage of soldiers returning from active duty in Iraq and Afghanistan suffer from symptoms of post-traumatic stress disorder, this is a significant issue. In an effort to understand the importance of music in this population, the next section identifies the symptoms of PTSD, the neurological response to trauma, how PTSD is diagnosed, and the complications that arise when it is left diagnosed.

PART II

ABOUT POST-TRAUMATIC STRESS DISORDER

Post-traumatic stress disorder is a type of anxiety disorder that results from experiencing traumatic events outside of the ordinary experience. Traumatic events can include military combat, terrorist attacks, sexual abuse, and natural disasters. Events such as divorce and financial loss are not inherently traumatic because they are within the normal realm of experience. After a traumatic event, strong emotions tied with the event cause changes in the brain that can lead to PTSD.⁴³ Understanding the symptoms of PTSD and the problems that can arise when it is left undiagnosed are important to understanding its treatment.

Symptoms

While most people experience post-traumatic symptoms after a traumatic event, not everyone will develop PTSD. It can depend on the intensity and length of exposure to the trauma, whether a close friend or family member died in the event, the amount of personal control that one felt over the situation, and the amount of support available afterward. Symptoms lasting longer than one month can be diagnosed as PTSD. Those lasting for less than a month can be categorized as Acute Stress Disorder (ASD).⁴⁴

The symptoms of post-traumatic stress disorder are outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), published by the American

⁴³ "What is PTSD?".

⁴⁴ Ibid.

Psychiatric Association. In order for one to be considered to have PTSD, one must have experienced an event with an actual or threatened injury or death. Symptoms are categorized as intrusive recollections, avoidance, and hyperarousal. A PTSD diagnosis requires one symptom of intrusive recollections, three symptoms of avoidance, and two symptoms of hyperarousal. The types of intrusive recollections include recurring dreams, flashbacks or hallucinations, and intense psychological distress while being exposed to situations similar to the traumatic event.⁴⁵ Types of avoidance include avoiding thoughts or feelings about the event, being unable to remember important details about the trauma, feeling apathetic, and feeling detached or isolated from society. Hyperarousal includes insomnia, irritability, difficulty concentrating, intensive vigilance, and an extreme startle response.⁴⁶ Symptoms of PTSD can be similar to those of another type of trauma-related injury called traumatic brain injury (TBI).⁴⁷ People

⁴⁵ In the third season of the television series *The West Wing*, the character Josh is shot in an attempted assassination of the President. Weeks later, at a private event, the sounds of the Prelude from J.S. Bach's *Suite No. 1* for solo cello suddenly trigger a traumatic flashback to the shooting. In Josh's mind, the sound of music resembled the sounds of ambulance sirens. This dramatic realization accurately shows how drastic and unexpected traumatic flashbacks can be (Sorkin et al. *The West Wing: The Complete Third Season*).

⁴⁶ *Diagnostic and Statistical Manual of Mental Disorders*, (Washington, D.C.: American Psychiatric Association, 2009).

⁴⁷ Some people suffering from PTSD have also suffered from traumatic brain injuries caused by external objects entering the brain or sudden and violent blows to the head. People have vastly different reactions to traumatic brain injury depending on where the injury is sustained in the brain (NINDS Traumatic Brain Injury Information Page). Different types of music therapy can be helpful for patients with resulting neurological challenges. In January 2011, Congresswoman Gabrielle Giffords was shot in the head and subsequently suffered from aphasia, the inability to speak, and impaired movement on the right side of her body. Because the brain is able to rewire its neurological connections around damaged areas, Giffords was retrained to speak with a type of music therapy called Melodic Intonation Therapy (MIT). It has been known for a long time that aphasic patients are capable of singing (Belin et al). In MIT, patients are retrained to speak by singing familiar songs, such as "Happy Birthday." Over time, patients are encouraged to speak in a song-like style similar to Arnold Schoenberg's "sprechstimme" style of speech-song until they are able to speak normally again. The rhythmic pulse and consistency in music was also utilized in retraining her to walk normally.

who have experienced trauma can often have both TBI and PTSD, but they are separate conditions.⁴⁸

Diagnosis

The critical component of a PTSD diagnosis is exposure to a traumatic event. The DSM-IV-TR specifically states that traumatic stressors must include a physical component that threatens death or serious injury. Verbal abuse alone does not qualify as a traumatic stressor unless it is also accompanied by physical aggression. That being said, witnessing physical events, such as seeing someone else fatally wounded in combat, can also qualify as a traumatic stressor.⁴⁹

Post-traumatic stress disorder is assessed with the Clinician-Administered PTSD Scale (CAPS), a structured interview that corresponds with the criteria in the DSM-IV-TR. The CAPS can be used for a current (past month) or lifetime diagnosis of PTSD. Trained clinicians knowledgeable in the most recent developments in PTSD research administer the 45-minute assessment.⁵⁰

⁴⁸ Though similar to PTSD, TBI is a physical injury to the brain that can be diagnosed as mild, moderate, and severe ("NINDS Traumatic Brain Injury Information Page"). People with mild TBI can lose consciousness for less than thirty minutes and experience amnesia for less than 24 hours. 80% of traumatic brain injuries in the civilian population are mild, sustained mostly in falls and automobile accidents. Symptoms following the traumatic event can include headache, dizziness, insomnia, and sensitivity to noise and light. 10-15% of people with TBI develop chronic symptoms that are somatic (headache, tinnitus, and insomnia), cognitive (memory loss and lowered attention span), and behavioral (irritability, depression, and anxiety) (Summerall, "Traumatic Brain Injury and PTSD").

⁴⁹ Claudia Baker and Cessie Alfonso, "Forensic Validity of a PTSD Diagnosis", National Center for PTSD <http://www.ptsd.va.gov/professional/pages/forensic-validity-ptsd.asp> (accessed 6 April 2012).

⁵⁰ D. D. Blake and others, "Clinician-Administered PTSD Scale (CAPS)", National Center for PTSD <http://www.ptsd.va.gov/professional/pages/assessments/caps.asp> (accessed 6 April 2012).

The Neurological Response to Trauma

Every physical disorder has mental components, and every mental disorder has physical components. While PTSD carried the stigma of dishonor and moral weakness during both World Wars, it is in fact a physical reaction to traumatic stress. The autonomic nervous system is the part of the body's nervous system that controls automatic bodily function outside of one's conscious control such as breathing and blinking. The autonomic nervous system is further divided into sympathetic and parasympathetic systems. The sympathetic system controls the "fight-or-flight" response, preparing the body for action by dilating the pupils, increasing heart rate, and pausing digestion. The parasympathetic system returns the body to a normal state by slowing the heart rate, constricting the pupils, and stimulating digestion.⁵¹

There is a section of the brain called the thalamus, which acts as the switchboard for information entering the brain.⁵² Sensory information perceived through sight, hearing, taste, and touch is sent directly to the thalamus, and is then distributed to separate areas of the brain, called cortexes, which are responsible for processing information for each of the five senses. In stressful situations, the thalamus directly sends information to another area of the brain called the amygdala, the part of the brain responsible for our reactions to fear. The transfer from thalamus to amygdala can happen in a low-road response or a high-road response. In a high-road response, information travels normally through other areas of the brain and arrives at the amygdala with context such as information about past experiences. Responses from this

⁵¹ Gazzaniga, Heatherton, and Halpern.

⁵² For detailed descriptions of parts of the brain important to this section, please refer to *Appendix: Basic Structures of the Brain*.

type of sensory transfer are planned and thoughtfully executed. In a low-road response, sensory information travels directly from the thalamus to the amygdala quickly to stimulate an instantaneous "fight-or-flight" response. A neurotransmitter⁵³ called norepinephrine is released, increasing emotional awareness. Swallow describes this process as an "immediate and unexpected assault" on the amygdala that can damage its cells, further limiting the chance of thoughtful responses.⁵⁴

During a traumatic event, the amygdala becomes over-stimulated and the danger response sets off the sympathetic nervous system to raise blood sugar, blood pressure, and heart rate. Prolonged trauma physically damages the brain by continually activating the amygdala. A person with post-traumatic stress disorder continues to suffer from symptoms long after the traumatic event as the body continues to sense danger in safe environments and stimulates the sympathetic nervous system in a process called sensitization.⁵⁵

Prevalence

The prevalence of post-traumatic stress disorder among veteran populations has remained relatively consistent since the Vietnam War but is much higher than the civilian population. The prevalence of a disorder is gauged by the proportion of people

⁵³ Neurotransmitters are chemicals that transmit information between neurons in the nervous system. For a list of neurotransmitters known to be beneficial and harmful in post-traumatic stress disorder, see "Box 1: Types of Neurotransmitters" on page 35.

⁵⁴ Michael Swallow, "Neurology: The Brain - Its Music and its Emotion: The Neurology of Trauma," in *Music, Music Therapy, and Trauma: International Perspectives*, ed. Julie P. Sutton (Philadelphia: Jessica Kingsley Publishers, 2002).

⁵⁵ Sethanne Howard and Mark W. Crandall, "Post Traumatic Stress Disorder: What Happens in the Brain?," *Washington Academy of Sciences Journal* 93, no. 3 (2007).

in a population that have the disorder at a given time, and can be measured by lifetime prevalence (over an entire lifetime) or by current prevalence (within a given time).⁵⁶ The U.S. National Comorbidity Survey Replication in 2003 estimated that the lifetime prevalence of PTSD among Americans was 6.8%.⁵⁷ In 1988, the National Vietnam Veterans Readjustment Study estimated that the lifetime prevalence of PTSD was 30.9% for males and 26.9% for females who served in the Vietnam War; 15.2% of males and 8.1% of females were diagnosed at the time.⁵⁸ Kang et al. (2003) estimated that 12.1% of Gulf War Veterans had PTSD at the time of their study.⁵⁹ According to these statistics, the prevalence of PTSD in military veterans is at least twice that of the civilian population.

The RAND Corporation conducted a study in 2008 that estimated the current prevalence of PTSD in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans to be 13.8%.⁶⁰ Because symptoms of PTSD can take years to appear, and because it is a chronic disorder, prevalence rates in OEF and OIF veterans will continue to increase over time.⁶¹ Additionally, the U.S. Department of Veterans

⁵⁶ Jaimie L. Gradus, "Epidemiology of PTSD", National Center for PTSD <http://www.ptsd.va.gov/professional/pages/epidemiological-facts-ptsd.asp> (accessed 5 April 2012).

⁵⁷ "National Comorbidity Survey", <http://www.hcp.med.harvard.edu/ncs/publications.php> (accessed 5 April 2012).

⁵⁸ R.A. Kulka and others, *Trauma and the Vietnam War Generation: Report of Findings from the National Vietnam Veterans Readjustment Study* (New York: Brunner/Mazel, 1990).

⁵⁹ H.K. Kang and others, "Post-Traumatic Stress Disorder and Chronic Fatigue Syndrome-like Illness among Gulf War Veterans: A Population-Based Survey of 30,000 Veterans," *American Journal of Epidemiology* 157, no. 2 (2003).

⁶⁰ T. Tanielian and L. Jaycox, *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery* (Santa Monica, CA: RAND Corporation, 2008).

⁶¹ Gradus.

Affairs reported that 54% of soldiers who left active duty between 2002 and 2009 did not seek a medical assessment from the VA, while 48% of those who did were diagnosed with PTSD.⁶² It can be inferred from this data that there are hundreds of thousands of recent veterans who remain undiagnosed.

Undiagnosed Post-Traumatic Stress Disorder

Undiagnosed post-traumatic stress disorder can lead to other severe social and health problems.⁶³ Untreated PTSD can exacerbate other problems such as alcoholism, suicidal thoughts, and relationship problems.⁶⁴ PTSD and alcoholism are often paired; people with PTSD are more likely to develop drinking problems, and people with drinking problems are more likely to develop PTSD than those without drinking problems. According to the National Center for PTSD, 60-80% of Vietnam Veterans who sought treatment for PTSD also reported alcohol overuse. While alcohol may temporarily mask symptoms, it can in fact irritate and prolong them. Feelings of isolation, irritability, and depression are exacerbated by alcohol; alcohol also makes the quality of sleep less refreshing. Drinking too much alcohol with PTSD can also lead to other psychiatric problems including panic attacks, depression, and addictions to other drugs.⁶⁵

⁶² "Mental Health Effects of Serving in Afghanistan and Iraq".

⁶³ Ibid.

⁶⁴ "What is PTSD?".

⁶⁵ "PTSD and Problems with Alcohol Use", National Center for PTSD
<http://www.ptsd.va.gov/public/pages/ptsd-alcohol-use.asp> (accessed 5 April 2012).

Research also shows that veterans with post-traumatic stress disorder are at higher risk of suicide. Veterans who have survived combat multiple times or have been hospitalized from combat wounds are at the highest risk. Some studies suggest that people with PTSD are more likely to consider suicide because of the depression, distressing memories, and anger associated with PTSD. Those with PTSD can also find it difficult to express their emotions, which is also associated with those considering suicide. In the veteran population, the strongest link to suicide attempts has been guilt over actions and decisions made in combat, which can be overwhelming.⁶⁶

Post-traumatic stress disorder can also affect family members and loved ones. Studies have shown that partners of veterans with PTSD are more likely to develop mental health conditions of their own than partners of veterans without PTSD. Common problems in relationships of veterans with PTSD include family violence, divorce, sexual problems, and aggression. Veterans with PTSD also have more difficulty expressing their emotions to their spouses than those without PTSD. The National Vietnam Veterans Readjustment Study showed that the divorce rate of those with PTSD was double the rate of those without PTSD, and veterans with PTSD were three times more likely to divorce more than once.^{67, 68}

⁶⁶ "Suicide and PTSD", National Center for PTSD <http://www.ptsd.va.gov/public/pages/ptsd-suicide.asp> (accessed 5 April 2012).

⁶⁷ Jennifer L. Price and Susan P. Stevens, "Partners of Patients with PTSD: Research Findings", National Center for PTSD http://www.ptsd.va.gov/professional/pages/partners_of_vets_research_findings.asp (accessed 5 April 2012).

⁶⁸ In a CBS interview, former U.S. Army Sgt. James Pitts retells the tragic story of how he killed his wife after returning from war. During a fight with his wife, her scream triggered a flashback to the scream of civilians about to be shot in the war. Sgt. Pitts suffered from many symptoms of PTSD, including drug and alcohol abuse, insomnia, and isolation. He had trouble with the VA because of vague screening processes and the social stigma associated with mental health visits (CBS, "Veteran Recounts Killing Wife").

In addition to increased divorce rates, families of veterans with PTSD were shown to have more family violence and more physical and verbal aggression. Byrne and Riggs⁶⁹ identified that 42% of the Vietnam veterans in their study engaged in at least one physical act of violence against their partner over the previous year, while 92% had engaged in verbal aggression. The severity of the PTSD symptoms in the veterans was also directly related to the severity of their relationship problems.⁷⁰

Veterans experiencing relationship problems and having difficulty transitioning back into family life may consider redeployment as a way to reconnect them with people who have gone through similar experiences. Because PTSD is diagnosed by an interview with a clinician, it is entirely possible for a soldier with PTSD to remain undiagnosed and be redeployed. This type of situation was illuminated in March 2012 when a U.S. soldier, potentially undiagnosed with PTSD, fatally shot seventeen Afghan civilians, including nine children. Staff Sergeant Robert had been in Afghanistan since December 2011, on his fourth deployment, following three in Iraq. While the Army accused him of being under the influence of alcohol, his lawyers claimed that the Army had failed to diagnose him with post-traumatic stress disorder, following an incident where he had seen a friend seriously wounded.⁷¹ Bales has not been officially diagnosed with PTSD or other combat-related psychiatric disorder but the negative effects of continual redeployment, and the alternatives for coping with readjustment, are worth considering. There are many types of therapies and medications available to treat post-

⁶⁹ C.A. Byrne and D.S. Riggs, "The Cycle of Trauma: Relationship Aggression in Male Vietnam Veterans with Symptoms of Posttraumatic Stress Disorder.," *Violence and Victims* 11, (1996).

⁷⁰ Price and Stevens.

⁷¹ "Robert Bales".

traumatic stress disorder, and with new telemedicine technologies, they are now more accessible than ever. The next section provides an overview of the types of treatment available for PTSD. While The U.S. Department of Veterans Affairs recommends psychotherapy and pharmacotherapy as the most effective types of treatment, music therapy is underutilized and can be as effective for symptoms of PTSD without the negative side effects of medications.

PART III

TREATING POST-TRAUMATIC STRESS DISORDER

The U.S. Department of Veterans Affairs recommends psychotherapy and pharmacotherapy as the two most effective treatments for PTSD. These therapies are effective for many individuals, but they have their limitations. Not everyone responds well to psychotherapy, and those who do not are unlikely to respond to more psychotherapy over time. Medicating PTSD also has its downsides as a long-term treatment because the body builds tolerance for medications over time that gradually weakens their effect. PTSD medications can also have undesirable side effects, such as anxiety, depression, insomnia, and suicidal thoughts. Therefore, the medications can actually exacerbate the symptoms of PTSD that they are supposed to treat, and are an expensive option for life-long treatment.⁷²

Another issue is the social stigma associated with a PTSD diagnosis for veterans. Given the history of PTSD in military culture throughout the 20th Century, it can be seen as a weakness. Between 2002 and 2009, one million U.S. soldiers returned from active duty. 46% of those soldiers sought a medical assessment from the VA, and half of them were diagnosed with PTSD. 54% of veterans returning from Iraq and Afghanistan have not sought a medical assessment, meaning that there could be up to 250,000 cases of undiagnosed PTSD in that veteran population alone.⁷³

This is a problem for of several reasons. Soldiers are often deployed multiple

⁷² *The Management of Post-Traumatic Stress Guideline Summary*, (U.S. Department of Veterans Affairs and the U.S. Department of Defense, 2010).

⁷³ Litz and Schlenger.

times, and the prevalence and severity of PTSD is much higher after each deployment. For every soldier who was killed in combat in Iraq and Afghanistan, 25 veterans have committed suicide after returning to America. PTSD can complicate family life, and there is a large amount of verbal and physical abuse in veterans' families. Some veterans have also found it difficult to get a job with a PTSD diagnosis.⁷⁴

Research has increasingly supported the use of music as therapy for symptoms of post-traumatic disorder. Music can alleviate hyperarousal, traumatic memories, and feelings of avoidance and isolation because of the connections it has with emotions, speech, and human physiology. Everyone listens to music, but not everyone knows that they can use it to modify their emotions. With a general understanding of the various ways in which music can alleviate symptoms of PTSD, those 250,000 individuals could be privately and inexpensively using music to ease their transition from active duty to their lives with friends and family at home. The following section describes how psychotherapy and pharmacotherapy have been used to treat PTSD and how recent research supports the use of music to enhance these treatments.

Psychotherapy

Psychotherapy is a type of treatment for psychological disorders that usually consists of a dialogue guided by a trained therapist.⁷⁵ The most important type of psychotherapy used for treating PTSD is trauma-focused, based on learning theory, cognitive theory, emotional processing theory, and fear-conditioning models. The most

⁷⁴ Williamson and Mulhall.

⁷⁵ *Medline Plus Medical Dictionary*, s.v. "Psychotherapy."

prominent types of trauma-focused psychotherapy are prolonged exposure (PE), cognitive processing therapy (CPT), and eye movement desensitization and reprocessing (EMDR). Each of these treatments is combined with training in anxiety management and stress reduction skills.⁷⁶

Prolonged Exposure Therapy

Prolonged Exposure Therapy (PE) was developed by Edna Foa at the Center for the Treatment and Study of Anxiety at the University of Pennsylvania. It has been empirically supported for twenty years and significantly improves PTSD symptoms in 80% of patients. PE is a flexible type of therapy that can be individualized for each patient.⁷⁷ Prolonged Exposure Therapy sessions are divided into four parts. The patient and therapist first talk about the patient's symptoms and about the treatment. The therapist then talks to the patient about techniques to control and regulate breathing when anxious or stressed. The patient is exposed to real-world situations called in-vivo exposure. Some everyday situations can trigger traumatic flashbacks, and individuals who have experienced them might avoid those everyday situations altogether. Patients can practice approaching those situations with in-vivo exposure.⁷⁸ To finish each

⁷⁶ Jessica Hamblen and others, "Overview of Psychotherapy for PTSD", National Center for PTSD (accessed 22 April 2012).

⁷⁷ "About Prolonged Exposure Therapy", Center for the Treatment and Study of Anxiety http://www.med.upenn.edu/ctsa/workshops_pet.html (accessed 23 March 2012).

⁷⁸ Photographer Jennifer Karady started a project called Soldiers' Stories five years ago. She works with veterans returning from Iraq and Afghanistan to create a staged narrative photograph representing their experiences transitioning back to civilian life. The month-long process is designed to be therapeutic for the veterans, while Karady and each veteran determine the best location, situation, and props for the photograph to convey the soldier's story. Photographs can be viewed online at Karady's website: http://www.jenniferkarady.com/soldier_stories1.html

session, the patient and therapist talk about the trauma to help the patient regain control over thoughts and emotions tied to the experience.⁷⁹

New technologies have helped to expand the types of exposure treatments available to veterans. Virtual Reality Therapy (VRT) is a type of PE during which patients are exposed to computer-generated simulations of combat situations. The patient wears a visual immersion device while the therapist controls the images and videos that simulate combat experiences on a computer. They might experience a simulation of a friend being shot or a detonated improvised explosive device (IED). The therapist talks with the patient throughout the process to assess his or her levels of stress and anxiety and guide him or her back into a normal state. VRT is particularly effective for PTSD patients who have a hard time picturing their traumatic memories and dealing with the resulting emotions.⁸⁰ Virtual reality therapy combines re-exposure and psychotherapy and is a safer alternative to re-deployment for those veterans feeling isolated.

Cognitive Processing Therapy

Cognitive Processing Therapy (CPT) is a psychotherapeutic method used to help patients discover why understanding his or her thoughts about a traumatic event has been difficult. CPT aims to show patients how the traumatic memory changed the way that they see and understand the world around them, and how the way they interact with the world directly affects their mood. In CPT sessions, the patient and therapist

⁷⁹ "Prolonged Exposure Therapy", National Center for PTSD
<http://www.ptsd.va.gov/public/pages/prolonged-exposure-therapy.asp> (accessed 23 March 2012).

⁸⁰ "Enhancing PTSD Treatment and Delivery", National Center for PTSD
<http://www.ptsd.va.gov/professional/pages/enhancing-ptsd-treatment.asp> (accessed 23 March 2012).

begin by discussing his or her symptoms and how CPT can help. Then they talk about the patient's current thoughts and feelings related to the traumatic event and explore new skills that will help the patient take control of his or her thoughts and feelings. Each session concludes by discussing how it is normal for a patient to have different beliefs about other people and the world around them before and after the traumatic event. They will talk about feelings of safety, trust, self-esteem, and other people, and about developing a balance between the patient's thoughts about each from before and after the trauma.⁸¹

Eye Movement Desensitization and Reprocessing

Eye Movement Desensitization and Reprocessing (EMDR) is another type of individual psychotherapy. At the beginning of each session, the patient identifies a calming memory and a traumatic memory, and the therapist helps him or her talk about any thoughts or physiological reactions associated with each. In repetitive 30-second exercises, the therapist asks the patient to think about the traumatic memory while following the therapist's finger from side to side with his or her eyes.⁸² The process continues until the patient reports no longer feeling anxious about the traumatic event. The therapist then asks the patient to think about the positive memory while repeating the same 30-second dual-attention exercises, thus reprogramming the positive feelings and physiological reactions in the place of the negative ones associated with the traumatic memory. Researchers are not entirely clear about how EMDR works,

⁸¹ "Cognitive Processing Therapy", National Center for PTSD
http://www.ptsd.va.gov/public/pages/cognitive_processing_therapy.asp (accessed 23 March 2012).

⁸² This process can also be done with the patient alternately tapping his or her left and right knees.

though some have theorized that it has a positive effect on anxiety and depression because of adaptive information processing, in which the splitting of the patient's attention between traumatic memory and eye movement helps replace the negative feelings about the trauma with positive feelings.⁸³

Pharmacotherapy

Prescription medication is also highly recommended by the U.S. Department of Veterans Affairs and the U.S. Department of Defense for treating post-traumatic stress disorder. Depending on each individual's case, pharmacotherapy can be used alone or in combination with psychotherapy. However, because PTSD is a chronic condition, it is important for each patient to consider both the benefits and risks of long-term medication.⁸⁵

Box 1: Types of Neurotransmitters⁸⁴

Serotonin: emotional states and dreaming; low levels are associated with anxiety, food cravings, and aggression.

Norepinephrine: states of arousal and alertness; promotes vigilance, the heightened sensitivity to one's surroundings. Stimulates the amygdala.

Dopamine: reward, motivation, and motor control.

GABA (gamma-aminobutyric acid): the primary inhibitory transmitter. Without GABA, synaptic activity can get out of control and spread throughout the brain.

Peptides: chemicals often released with neurotransmitters that modify the effect of the neurotransmitters. They can shorten or prolong the neurotransmitters' actions.

Endorphins: peptides involved in natural reward and pain reduction.

Medications are effective in treating PTSD by altering chemical ratios in the brain. Chemicals in the brain called neurotransmitters communicate information

⁸³ "Eye Movement Desensitization and Reprocessing", National Registry of Evidence-Based Programs and Practices <http://nrepp.samhsa.gov/ViewIntervention.aspx?id=199> (accessed 23 March 2012).

⁸⁴ Gazzaniga, Heatherton, and Halpern.

⁸⁵ *The Management of Post-Traumatic Stress Guideline Summary.*

between neurons about which neurons should be activated.⁸⁶ Problems arise when there are too many or too few of a particular neurotransmitter. This is how neurotransmitters affect thoughts, emotions, and behaviors. Medications can also affect thoughts, emotions, and behaviors by altering the actions of neurotransmitters. They can alter how neurotransmitters are synthesized in the postsynaptic neuron, raise or lower the amount of neurotransmitters released by the presynaptic neuron, and change the way that neurotransmitters are deactivated by blocking reuptake or preventing enzyme deactivation.⁸⁷

The strongly recommended medications with the most significant clinically proven benefits are the anti-depressant Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin Norepinephrine Reuptake Inhibitors (SNRIs). SSRIs and SNRIs work to improve mood by maintaining relatively high levels of serotonin and norepinephrine.⁸⁸ Benzodiazepines are effective for treating anxiety, but SSRIs are usually prescribed in

⁸⁶ Neurons are cells specialized for communication and are the basic units of the nervous system. They are not connected to each other, so communication between neurons depends on electrical signals released during a process called neuronal firing. The electrical signals release chemicals, called neurotransmitters, into the space between neurons, called the synapse. Neurotransmitters transmit information to adjacent neurons about whether or not to fire. The signals are either excitatory, telling the adjacent neuron to fire, or inhibitory, reducing the likelihood of firing. Neurons are constantly receiving both excitatory and inhibitory signals, so neuronal firing depends on the amount and frequency of excitatory signals.

When a neurotransmitter is released from a neuron (the presynaptic neuron), it travels across the synapse to an adjacent neuron (postsynaptic neuron). Receptors on the postsynaptic neuron are proteins that receive specific neurotransmitters, like a lock that only unlocks with a specific key. If the receptor accepts a neurotransmitter, it increases the likelihood that the neuron will fire. Drugs and toxins can imitate neurotransmitters by binding with receptors as if they were neurotransmitters.

Neurotransmitters continue to bind with postsynaptic receptors until their influence is terminated by one of three processes. Reuptake, the most common, happens when neurotransmitters are taken back into the presynaptic neuron. Enzyme deactivation occurs when enzymes destroy the neurotransmitter while it is in the synaptic cleft. Auto-reception is a process that occurs when excess neurotransmitters bind with receptors in the presynaptic neuron (Gazzaniga et al., 2010).

⁸⁷ Gazzaniga, Heatherton, and Halpern.

⁸⁸ Examples of SSRIs include Fluoxetine, Paroxetine, and Sertraline. One SNRI recommended by the U.S. Department of Veterans Affairs is Venlafaxine (*The Management of Post-Traumatic Stress Guideline Summary*, 2010).

their place because their long-term use can be addictive. Medications known to have some benefit include Prazosin for nightmares and irregular sleep, and Amitriptyline and Imipramine as antidepressants. Others such as Guanfacine and the anticonvulsants Tiagabine, Topiramate, and Valproate have no benefit and are potentially harmful.⁸⁹

While SSRIs and SNRIs are both proven treatments for PTSD, they both have potentially negative side effects such as insomnia, anxiety, and suicidal thoughts, all of which are symptoms of PTSD to begin with. Their effects can diminish over time as the body learns to tolerate them, and they are an expensive option for life-long treatment.⁹⁰ Many veterans do not seek a medical assessment when they return from combat for these reasons. One way to help alleviate the symptoms of PTSD inexpensively and without damaging side effects is with music.

Music as Therapy

The development of the music therapy field since the American Music Therapy Association was founded in 1997 has led to its widespread use in treating Alzheimer's disease, stroke, Parkinson's disease, multiple sclerosis, pain, depression, and anxiety. Recent studies on music therapy and the relationship between music and language have also supported its use to alleviate the symptoms of post-traumatic stress disorder. Music does not have the negative side effects associated with prescription medications, and it can be available to everyone with laptops, portable music players, and free online services such as YouTube and Spotify. By understanding how research supports the use

⁸⁹ *The Management of Post-Traumatic Stress Guideline Summary.*

⁹⁰ James M. Ferguson, "SSRI Antidepressant Medications: Adverse Side Effects and Tolerability," *Primary Care Companion to the Journal of Clinical Psychiatry* 3, no. 1 (2001).

of music therapy for PTSD, anyone can apply the same ideas to their own lives and use music as a tool to alleviate symptoms of PTSD and facilitate their transition back into civilian life.

There has been considerable research on the physiological reactions the body has to music. A study by Harrer and Harrer in 1977 showed that music affects pulse, respiration, electrical currents in the skin, and the muscles. In particular, pulse changes along with tempo changes in music.⁹¹ Saperston described a study in 1995 along similar principles to the Harrer and Harrer study with more specific results about how music can affect pulse. In this study, a piece of music with a tempo only one beat per minute (BPM) slower than a participant's heart rate caused the heart rate to slow down.⁹² These two studies suggest that an individual feeling anxious, with a heightened heart rate, could use music in a slower tempo to normalize heart rate and reduce anxiety.

For patients with post-traumatic stress disorder, activity in the amygdala, the center for fear and emotions in the brain, can become a conditioned response to its own resulting symptoms. Over-breathing, for instance, is a natural response to an unnerving situation; but it is possible that over-breathing in an unrelated situation could trigger activity in the amygdala, which would in turn trigger the body's fear response once again. Similarly, a fear response triggered by the amygdala can become a conditioned response to a memory of a traumatic event.⁹³ Michael Swallow claims that music can be

⁹¹ Thompson, W. F., E. G. Schellenberg, and G. Husain. "Decoding Speech Prosody: Do Music Lessons Help?" *Emotion* 4, (2004): 46-64.

⁹² Saperston, B. (1995) 'The Effect of Consistent Tempi and Physiologically Interactive Tempi on the Heart Rate and EMG Responses.'

⁹³ J. LeDoux, *The Emotional Brain* (London: Weidenfeld and Nicolson, 1998).

used to decondition explicit memories from the fear response. In “Neurology: The Brain—Its Music and its Emotion”, he says:

Recovery – or deconditioning – is an active but lengthy process and may never be completely achieved. However, any process that inhibits activity in the brain, or a specific area of the brain (in this case the amygdala nucleus) can, by raising the threshold for anxiety, reduce the likelihood of resurgence of traumatic memories.⁹⁴

In other words, deconditioning traumatic memories from a fear response in the body works by inhibiting activity in the amygdala, which will reduce the chances that a traumatic memory will result from other symptoms of PTSD.⁹⁵

One example of deconditioning is the use of pharmacotherapy. Medications activate and inhibit specific neurotransmitters, which in turn activate and inhibit specific regions in the brain. The common medication Valium, for example, is received in receptor sites in the amygdala and acts as a neurotransmitter to inhibit activity. Research suggests that music may stimulate the release of endorphins that act in the same way as drugs like Valium. The endorphin adrenocorticotrophin (ACTH) is a hormone released when listening to music that can inhibit activity in the amygdala.⁹⁶ If research continues to support using music to activate the release of endorphins in the

⁹⁴ Swallow.

⁹⁵ Musicians involved in the Alexander Technique also practice deconditioning seemingly automatic stress responses in their performance. In particularly difficult parts of a piece of music, the act of missing a big shift for a string player can become conditioned with physical tension in the body. The fear of missing the shift in future performances therefore stimulates the same physical tension, which complicates the physical process of movement and increases the likelihood that the string player will continue to miss the shift. Rather than practicing the shift repetitively with the added tension, the Alexander Technique encourages the musician to recognize the tension, release the tension, and decondition the tension from the motion involved in the shift. The Alexander Technique is not limited to musicians and has been particularly helpful in both my cello playing and the awareness I have about how I use my body in everyday activities like walking up flights of stairs and typing at the computer.

⁹⁶ Swallow.

body, it could be an appealing alternative to pharmacotherapy without the unknown and inevitable side effects.

According to Daniel J. Levitin, neuroscientist at McGill University and author of *This is Your Brain on Music*, listening to music uses almost every part of the brain, starting with the subcortical structures below the cerebral cortex and the auditory cortexes in both hemispheres. Following along with music or listening to a familiar style involves the hippocampus. Tapping along to the music engages the timing circuits regulated in the cerebellum. Performing music, whether instrumentally, vocally, or conducting, involves the frontal lobes for planning behavior, the motor cortex for movement, and the sensory cortex to process feedback about playing the right notes or moving the baton in the right direction. Reading music uses the visual cortex in the occipital lobe, while listening to music with lyrics uses the speech centers of the brain, including the Broca's area and the Wernicke's area. Additionally, the amygdala is responsible for the mind's emotional response to music. Though the responsibility of processing music is distributed to the many various regions of the brain, they all perform together and coordinate the information in what is, in some senses, a collective community engagement project.⁹⁷ Based on this information, the involvement of each of these structures in the brain could suggest that music can be useful for alleviating PTSD symptoms that involve these areas of the brain. For example, perhaps an individual unable to express his or her emotions about a traumatic event in words could do so with music as a facilitator to activate the amygdala and the speech centers of the brain.

⁹⁷ Daniel J. Levitin, *This is Your Brain on Music: The Science of a Human Obsession* (New York: Plume, 2006).

Recent research has drawn connections between music and speech in several areas that support this idea.

Aniruddh D. Patel, neurobiologist at The Neurosciences Institute in La Jolla, California, describes significant research in his book *Music, Language, and the Brain* that links music and language through essential elements including pitch, rhythm, and emotions. People are able to recognize basic emotions in speech such as happiness, sadness, anger, and fear in both familiar and unfamiliar languages.⁹⁸ A study by Juslin and Laukka in 2003 showed that people are good at discerning basic emotions not only in speech, but also in music. They hypothesized that instrumental music is perceived as a super-expressive voice; even though musical instruments do not necessarily imitate the sound of the voice, instrumental music does contain similar auditory cues that evoke the same emotional responses. According to their study, effective auditory cues included speech rate and tempo, voice intensity and sound level, pitch contour, and vocal onsets and instrumental articulations.⁹⁹

To strengthen the connection between emotions in speech and music, Thompson et al. examined the transferability of musical and vocal skills by studying if musical training improves the ability to discern emotions in speech. Native English speakers, half trained and half untrained in music, were asked to emotionally categorize phrases in English and Tagalog into happy, sad, angry, and frightened. The musically trained participants were able to recognize all four emotions in speech, particularly sadness and fear. They were also significantly better at discerning emotions in the unfamiliar

⁹⁸ Aniruddh D. Patel, *Music, Language, and the Brain* (New York: Oxford University Press, 2008).

⁹⁹ P. N. Juslin and P. Laukka, "Communication of Emotions in Vocal Expression and Music Performance: Different Channels, Same Code?," *Psychological Bulletin* 129, (2003).

language of Tagalog, which suggests that the results were purely based on acoustical cues rather than the language itself.¹⁰⁰

In order to determine whether individuals who seek musical training are more sensitive to acoustical cues to begin with, Thompson et al. conducted another study with six-year-old children. One group of children received music lessons for one year, while another group received no musical training for one year. At the end of the year, the children were tested on their ability to discern between happy and sad, and angry and frightened. Children in both groups were able to differentiate between happy and sad very well, but those who received music lessons did much better at determining the differences between anger and fright.¹⁰¹

The results of the information presented by Patel, Juslin and Laukka, and Thompson et al. all show the strong emotional connections in speech and music. Many people suffering from post-traumatic stress disorder have trouble accessing and verbalizing emotions related to their traumatic memories, so engaging with music could be an extremely beneficial tool. Emotions can be expressed in both speech and music, and people are able to understand emotions in both speech and music. Moshe Bensimon et al. describe in their study that the traumatic memories of individuals with PTSD are stored in inflexible structures in the brain, which means that they cannot be modified into other memories. This makes it nearly impossible to translate sensory motor representations into meaningful symbolic and verbal representations; in other words, it becomes difficult to represent emotions in words. Music is also a sensory

¹⁰⁰ W. F. Thompson, E. G. Schellenberg, and G. Husain, "Decoding Speech Prosody: Do Music Lessons Help?" *Emotion* 4, (2004).

¹⁰¹ Thompson, W. F., E. G. Schellenberg, and G. Husain. "Decoding Speech Prosody: Do Music Lessons Help?" *Emotion* 4, (2004): 46-64.

experience, so Bensimon et al. infer that it can access the stored traumatic memories that words cannot do alone.¹⁰² One type of music therapy designed to help patients talk express their traumatic memories is the Bonny Method of Guided Imagery and Music.

The Bonny Method of Guided Imagery and Music (GIM)

Guided Imagery and Music (GIM) is a common type of music therapy for treating PTSD and is based on Altshuler's iso principle of matching the mood of the music to the mood of the patient, and is a type of psychotherapeutic music therapy. The music therapist plays music for the patient and they discuss the emotions associated with the music. The therapist continues to guide an analytical discussion with the patient through various images and emotions by changing the music. GIM can be conducted in both group and individual settings depending on the length of a patients' stay. Though most patients with PTSD engage in group GIM, it is important to know the process of individual therapy to understand how group therapy works.

An individual session of GIM has four components. In the prelude, the therapist and patient engage in a dialogue to assess the patient's current state and identify specific goals for the session. Next, the therapist leads a relaxation exercise to bring the patient into an altered state of consciousness. After the relaxation exercise, the therapist guides the patient through a carefully chosen selection of music and asks him or her to describe any feelings or emotions that they have while the music is playing. They talk about these images and emotions throughout the session. At the end of this section, the therapist helps the patient resolve any unclear images or emotions and brings him or

¹⁰² Bensimon, Wolf, and Amir.

her back into a normal state of consciousness. In the postlude, the patient talks about his or her experience, connecting moments of the imagery with the session's goals.¹⁰³

The trust between patient and therapist is essential for the effectiveness of Guided Imagery and Music. With this trust, GIM can relieve symptoms of hyperarousal, increase concentration, and connect conscious and unconscious states. By connecting conscious and unconscious states, a patient may be able to access the unconscious memories affecting conscious emotions or the unconscious emotions resulting from conscious traumatic memories. Blake and Bishop describe the successful case of John, a Vietnam veteran who went through a 16-week GIM program for PTSD. He had alexithymia, the inability to express emotions, and could not remember most his experiences in Vietnam. However, he could remember the name of Lee Sun, the first man that he killed in Vietnam. As John described, "...the most important date is the person's death...I have the date when I killed Lee Sun...I'm the only one who knows the day he died."¹⁰⁴ John felt empty, as if a part of him had died with Lee Sun. After GIM, though, John later stated that he felt the need to contribute to society so that Lee Sun did not die in vain.¹⁰⁵ Music therapy helped him transform his feelings of emptiness into a sense of purpose. The careful selection of music and guiding questions helped lead John through this emotional transformation.

While individual GIM offers more specific guidance for each patient, group GIM is more tightly structured. The relaxation period is short, and the music only lasts for

¹⁰³ Roberta L. Blake and Susan R. Bishop, "The Bonny Method of Guided Imagery and Music (GIM) in the Treatment of Post-Traumatic Stress Disorder (PTSD) with Adults in the Psychiatric Setting," *Music Therapy Perspectives* 12, no. 2 (1994).

¹⁰⁴ *Ibid.*, 128.

¹⁰⁵ *Ibid.*

ten minutes. The imagery and discussion is highly specific, and is supplemented with writing, drawing, and movement. Group GIM is most popular among veterans because with the increasing numbers of soldiers returning with PTSD, military hospitals and VA centers are overcrowded. However, it is recommended that patients continue with longer-term outpatient therapy to rebuild relationships in which they can trust.¹⁰⁶

Drumming in Music Therapy

Drumming is also an effective activity for alleviating symptoms of PTSD. A study by Moshe Bensimon et al. is one of the only studies available on drumming for PTSD symptoms, and the results were promising. Nine participants met with a therapist for sixteen group sessions. Everyone sat in a circle and each participant was given a percussion instrument. Discussions and drumming were unstructured and the last ten minutes of each session were spent listening to calm music. By the end of the study, there were significant improvements in the sense of trust, community, and communication among patients. It also proved to be an effective release of energy for those with anxiety and built-up energy.^{107, 108}

One of the major goals of music therapy for patients with PTSD is to foster a sense of togetherness and open communication. Bensimon et al. claim that while in group discussions, it is not possible for everyone to talk simultaneously and feel a collective “we,” it is possible in music that:

¹⁰⁶ Ibid.

¹⁰⁷ Bensimon, Wolf, and Amir.

¹⁰⁸ While in Iraq, soldiers often listen to percussive heavy metal and rap music as a ritual to prepare for their missions. Music for them becomes a unifying emotional factor that motivates them much in the same way that marching does in combat training (Pieslak).

...an individual can simultaneously listen to his or her own playing, pay attention to another's music, and listen to the entire group product as a whole without the necessity of eye contact while attaining a feeling of the group as a harmonic entity.¹⁰⁹

Participants did in fact report an improved sense of contact, unity, and togetherness while drumming. Drumming can foster togetherness through its strong rhythmic impulses. Bodily movements and reactions to rhythm, including nodding heads and tapping feet, unite individuals within a group. Another important result of the study was an increased sense of trust across the sixteen sessions. At first, no one played their drums as each participant got a sense for the others. As the study continued, there was an increase in the total amount of time spent drumming, both individually and in the group. By the end of the study there was more group drumming than individual drumming.¹¹⁰ Developing interpersonal communication is essential for patients with PTSD. The increased amount of group drumming at the end of the study shows the effectiveness of this type of therapy in rebuilding the broken sense of trust and community in some individuals that is so prominent in military culture.

Recent research described by Aniruddh Patel suggests strong connections in the way the brain groups rhythms in speech and music. Grouping is the way that we perceive the beginnings and ends of spoken and musical phrases. There is evidence that the processes in the brain for grouping in speech and music are similar, which we know from electrical brain responses called event-related potentials (ERPs) that activate shortly after a phrase ends.¹¹¹ Two recent studies support this idea. By studying ERP

¹⁰⁹ Bensimon, Wolf, and Amir: 35-36.

¹¹⁰ Ibid.

¹¹¹ Patel.

responses to grouping in hummed speech, Steinhauer and Friederici in 2001¹¹² and Pannekamp et al. in 2005¹¹³ found that the ERPs were stimulated by the musical factors of rhythm, intonation, and stress rather than linguistic syntax. Knösche et al. found similar ERPs at the end of musical phrases. They also identified that the hippocampus and an area of the brain called the posterior cingulate cortex are both involved in the process, which are areas of the brain responsible for attention and memory processing. Though the ERPs in response to musical grouping did not explicitly identify phrase boundaries, they did show the process of attention and memory changing focus from each phrase to the next.¹¹⁴ This finding suggests another connection between the processing of rhythms in speech and music. Drumming in groups can create rhythmically complex music, so this could be the reason why the study by Bensimon et al. found that drumming was an effective process to improve communication.

In addition to their findings on trust and community, Bensimon et al. also found that drumming was an effective way to communicate anger and built-up energy. By drumming *fff* (as loud as possible), one can release an enormous amount of energy and feel a sense of relief. Drumming loudly requires long and aggressive arm movements, which can in turn release aggression through motion and in sound. The resulting sound

¹¹² K. Steinhauer, K. Alter, and A. D. Friederici, "Brain Potentials Indicate Immediate Use of Prosodic Cues in Natural Speech Processing," *Nature Neuroscience* 2, (1999).

¹¹³ A. Pannekamp and others, "Prosody Driven Sentence Processing: an ERP study.," *Journal of Cognitive Neuroscience* 17, (2005).

¹¹⁴ T. R. Knösche and others, "The Perception of Phrase Structure in Music," *Human Brain Mapping* 24, (2005).

waves travel through the air and drumsticks back into one's body, which increases self-awareness and may also facilitate an emotional release.¹¹⁵

The research described above strongly supports using music to treat symptoms of PTSD in the veterans returning from Iraq and Afghanistan. The connections between music and language make it an effective tool for accessing and expressing traumatic memories, building trust, relieving anxiety, and constructively releasing aggressive feelings. However, in the same way that medications can cause the same symptoms they alleviate, music has also been used in ways that have left people traumatized. Though music therapy is still an underutilized treatment for the veterans returning from the recent wars, the U.S. military uses music as torture in its detention camps.

Music as Torture

In the same way that the SSRIs and SNRIs recommended by the U.S. Department of Veterans Affairs can exacerbate the common PTSD symptoms of anxiety, depression, traumatic dreams, insomnia, and suicidal feelings, music can also be administered harmfully. Music associated with a traumatic event can trigger a traumatic flashback. Also, despite the fact that music therapy is still an under-acknowledged treatment for symptoms of PTSD, the U.S. military has administered loud music in the recent wars before and after interrogation to weaken prisoners' resistance to interrogation. Because of the non-disclosure agreements prisoners must sign at their release, information about the government's use of music as torture remained classified until 2006 when Donald Vance, an American citizen tortured with music at a military prison in Baghdad, revealed his story publicly to *The New York Times*.

¹¹⁵ Bensimon, Wolf, and Amir.

United States Navy veteran Donald Vance was taken into custody in Baghdad on April 15, 2006 after alerting the U.S. Embassy that members of the Iraqi-based company for which he had worked were involved in illegal weapons trafficking. After directing the U.S. forces to the weapons, he was brought to the embassy and offered lodging nearby. Overnight he was hooded, shackled, and taken to “Camp Cropper,” a major detention camp at the Baghdad International Airport, where he was held for three months without any information about why he was there. He was forced to listen to loud heavy metal and country music while being deprived of sleep and subjected to extreme temperatures. At Camp Cropper, Vance occupied a nine-by-nine foot cement cell and was fed irregularly. The lights were always turned on and the temperature was regulated between 55° and 60°F. Heavy metal music by artists such as Nine Inch Nails, Mr. Self Destruct, and March of the Pigs blasted from two large speakers at the end of the hallway, in addition to frequent renditions of “We Are the Champions” by Queen. Though his original reaction to the music was purely annoyance, the loud music eventually instigated a “war of wills” with Vance’s psyche. He was mostly affected by songs that he had liked and played at home. Since returning home after his release, he has suffered from sound-induced anxiety, insomnia, eating disorders, paranoia, agoraphobia, and other symptoms of post-traumatic stress disorder.^{116, 117}

¹¹⁶ Suzanne Cusick, ““You are in a place that is out of the world...”: Music in the Detention Camps of the ‘Global War on Terror’.” *The Society for American Music* 2, no. 1 (2008).

¹¹⁷ Like all other detainees, Vance signed a non-disclosure agreement at his release from Camp Cropper, but he hopes that publicizing his case to the media will protect him from any consequences. In 2007 he received the Ridenhour Truth-Telling Prize for his detailed account in the *New York Times* in December 2006. He is currently in the process of filing a lawsuit against former Secretary of Defense Donald Rumsfeld after a federal appellate court ruled in his favor in August 2011.

Music and sound have been used as psychological tactics since World War II. Nazi-controlled radio station “Axis Sally” broadcasted American popular music with propaganda ads in the commercials. When the British suspected the Germans of planning a naval invasion by way of the English Channel, they broadcasted a BBC program designed to teach English phrases to Germans, some of which suggested that they were capable of setting the entire Channel on fire. In the Vietnam War, Americans projected stories over loudspeakers about the Vietnamese fear of dying away from home, meant to intimidate the enemy and deter them from attacking. During Operation Just Cause in 1989, the U.S. military used music to block communication between Panamanian dictator Manuel Noriega and the outside world as he sought asylum. Knowing that he was an opera lover, they blasted heavy metal on loudspeakers outside of the Vatican Embassy, where he was staying.¹¹⁸

The U.S. Military also blasted music over loudspeakers as a psychological tactic in Iraq. In the 1979 film *Apocalypse Now*, loudspeakers attached to US helicopters blasted Wagner’s “Ride of the Valkyries” as they fought in North Vietnam. Though it is not documented that this was done during the Vietnam War, it is currently used in “thunder runs,” during which the army attacks heavily for an amount of time before retreating, both motivating the American soldiers and intimidating the enemy. This music, usually rock or heavy metal, is used to agitate the insurgents and to weaken their defense. Ideally, and frequently, insurgents surrender without fighting.¹¹⁹

¹¹⁸ Pieslak.

¹¹⁹ Ibid.

The Military also uses music as part of its interrogation process in detention camps. In “dark prisons,” detainees are deprived of food and water, locked in cells with no light, and forced to listen to loud rap, rock, and heavy metal music for weeks at a time.¹²⁰ Detainees can be interrogated while shackled to the floor of a room with a strobe light. Sensory deprivation and sensory overload are fast and effective ways to break down one’s resistance to interrogation, often blurring the distinction between hallucination and reality. The CIA’s *KUBARK Counterintelligence Manual*, a manual the CIA formerly used to teach its interrogators the most effective techniques, states that

The interrogation situation is in itself disturbing for most people experiencing it for the first time. The aim is to enhance this effect, to disrupt radically the familiar emotional and psychological associations of the subject. When this aim is achieved, resistance is seriously impaired. There is an interval--which may be extremely brief--of suspended animation, or psychological shock or paralysis. It is caused by a traumatic or sub-traumatic experience which explodes, as it were, the world that is familiar to the subject as well as his image of himself within the world. [T]he more well-adjusted...the subject is, the more he is affected.¹²¹

In “dark prisons,” these tactics are not only effective in instilling the “psychological shock” described in the KUBARK manual, but also in traumatizing detainees such as Donald Vance. There has been more focus in the media on music torture since two reporters for *Time* magazine obtained the log for another prisoner’s two-month interrogation at Guantánamo Bay in 2005.¹²²

¹²⁰ Though heavy metal and rap music have been highly effective in interrogation, children’s songs and recordings of crying babies are also commonly used. According to Clive Stafford Smith in a 2008 article in *The Guardian*, the most “overused” torture song in the U.S. military is “I Love You” by Barney the Purple Dinosaur.

¹²¹ *KUBARK Counterintelligence Interrogation*, 1963. 65-66.

¹²² Cusick.

Muhammad al-Qatani was detained in Guantánamo Bay from November 2002 until January 2003 and subjected to music torture. In June of 2005, *Time* magazine published an article about the use of Christina Aguilera's music in his torture. According to the interrogation log, different types of music, including that of Aguilera, were used in combination with other interrogation techniques in various situations. Sometimes loud music was used to keep him awake, and other times to agitate or annoy him. It could also be used in combination with a process known as "invasion of space by female." He would be forced to cross-dress and look at suggestive photographs of women, and would be accused of homosexuality when he tried to look away.¹²³ al-Qatani claimed in his interrogation that listening to music was anti-Islamic because it distracted the mind from devotion to God; he also claimed that listening to music made by a woman was against Islam because of its lustful potential. For al-Qatani, being forced to listen to loud music by Christina Aguilera was not just agitating, but unavoidably sinful.¹²⁴

In the same way that the medications so commonly prescribed for PTSD symptoms can cause some of the exact symptoms that they treat, the way the military has used music in its detention camps can also traumatize prisoners. Knowing that music can be harmful, it is important to understand how music can be used best as therapy and how it might be detrimental. Music associated with a traumatic event could trigger a flashback, and loud percussive music can induce anxiety. Given the emotional and physiological effects music can have, it is not surprising that it can be an effective

¹²³ The use of music in this context is permissible by one government report classifying it as a technique called futility. Gender coercion is also considered futility, in which women interrogators might rub their perfume on detainees, rub a red substance they identified as menstrual blood on detainees, or force male detainees to stand naked before them (Cusick).

¹²⁴ Cusick.

tool for psychological warfare. As a musician, though, it is startling that music, which has always helped me organize my mind and offered me something to which I can relate my emotions, has been used by our government in ways that can leave its own citizens traumatized. Even though this harmful practice exists, music can be employed more often and given more credit for its powerfully therapeutic effects.

CONCLUSION

Post-traumatic stress disorder is an issue that has accumulated in millions of veterans since the Vietnam War, and one that has not been entirely cured. Veterans from all of the wars since Vietnam are still suffering from symptoms of PTSD. Due to the economic recession at the time of the U.S. withdrawal from Vietnam, there were few medical resources available and many were not effectively treated when they returned from active duty.¹²⁵ Though the U.S. Department of Veterans Affairs has doubled its mental health budget since 2001, hundreds of thousands of soldiers are still left undiagnosed out of fear of the social stigma associated with a PTSD diagnosis and the cost and side effects of pharmaceutical treatment.¹²⁶ This does not have to be the case, and recent research on music as therapy has proven that it can be an effective and safe treatment. Music can be used to alleviate hyperarousal, traumatic flashbacks, and avoidance, all three of the major categories of PTSD symptoms. Music can provide an emotional outlet and facilitate the verbal expression of a traumatic memory. The body's physiological response to music is a testament to the potential of music as a tool for emotional regulation. Perhaps above all, it can provide a platform for building trust and community, as demonstrated by Bensimon et al., in a veteran population prone to feeling isolated and potentially suicidal after returning from multiple deployments.

The professional field of music therapy will continue to be an essential part of the transitional phase for those veterans who seek treatment. However, there are still

¹²⁵ *VA History in Brief*, 2006.

¹²⁶ Williamson and Mulhall.

hundreds of thousands of veterans potentially suffering from traumatic symptoms who will not actively seek treatment because of the social stigma or because treatment is not easily accessible to them either financially or geographically. Music is accessible to everyone, though, and can function as both a private and a group experience. Conservatory-trained musicians can relate to the ways that music can be emotionally powerful. There is an abundance of musical talent that can be put to use effectively for this population of veterans with an understanding of how the veterans can be suffering and how music has been shown to help. In the final section of this document, I propose a workshop that can be led by any conservatory-trained musician that is designed to educate veterans about ways they can use music in their daily lives to regulate and connect with their emotions.

WORKSHOP PROPOSAL: USING MUSIC TO REGULATE YOUR EMOTIONS

Instructor: A conservatory-trained musician informed about PTSD symptoms and effective treatments using music

Type of Presentation: Lecture-workshop

Duration: 1 hour

Audience: 50 soldiers currently or formerly in active duty

Workshop Goal: To expose soldiers to information about how they can use music to regulate their emotions. The workshop will be interactive in the sense that soldiers will suggest songs they know and respond to questions about emotional impressions of different kinds of music.

Introduction: Recognizing the emotional connections in music. 5 minutes

The Point: People have emotional reactions to the music that we hear.

Q: What emotion do you feel when you listen to this music?

1. Kanye West: "Gorgeous"
2. Bach: "Allemande" from a solo cello suite

Emotions based on music 10 minutes

The Point: We respond to what we hear. Sometimes, other people choose the music for us.

Example: Businesses choose music to affect your perception of a product:

1. iPod: The change in music from the original iPod commercial and the iPhone 4s commercial. How do you perceive each product?
2. Coca-Cola: What is your perception of this product based on the background music? What is your perception of this product based on different background music imposed onto the image?

Music based on emotions 10 minutes

The Point: We can also choose music based on the emotional content because we associate our emotions with music and can relate to music.

Example: What music do you associate with each of the following emotions?

Pose this question to the audience. Accept the first answer for each emotion and play an excerpt of the song using YouTube, Spotify, or Pandora.

1. Happy
2. Sad
3. Fearful
4. Angry
5. Hopeful
6. Content

Note: Songs can bring you back to specific moments of your life. It is important to be mindful of the music you choose to listen to. For example, listening to a song that you listened to with an ex-girlfriend can exacerbate the pain of your breakup, even if the song formerly made you happy.

Music to regulate mood

10 minutes

The Point: Music can either exacerbate or change your mood. Match the music to your mood and gradually change the music to affect your mood.

Example: Play the songs from the examples given above in the order of “sad,” “hopeful,” and “content.”

Musical analysis

20 minutes

The Point: To relate to the music by analyzing aspects of it including melody, harmony, rhythms, and song lyrics. Play each song once, analyze each aspect, and play it through again.

Example 1: Kanye West, “Gorgeous.”

- How does it make you feel?
- Backbeat
- Harmonic Progression
- Repeating melodic line
- Refrain lyrics

Example 2: *Allemande* from Bach Cello Suite No. 2 in D Minor

- How does it make you feel?
- Basic rhythmic pulse
- Melody
- Bass line
- Harmonies
- Repeating rhythmic motives

Review and Questionnaire

5 minutes

The Point: Review the following concepts:

- Perceptions based on music
- Emotions based on music
- Emotional regulation
- Musical analysis

Questionnaire: What did you learn? How can you apply music in your daily life to regulate your emotions?

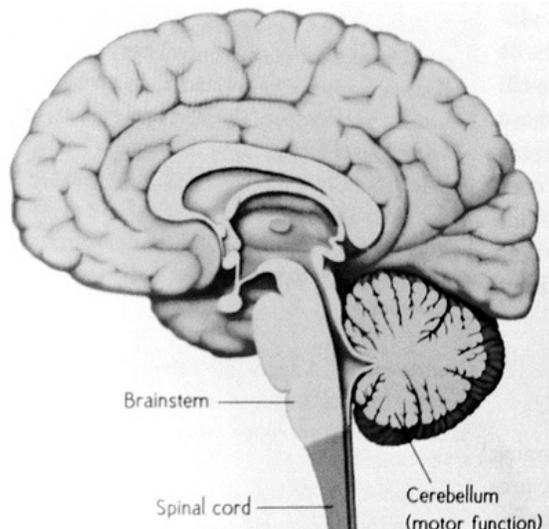
General Guidelines: The American Music Therapy Association’s publication *Music Therapy Interventions in Trauma, Depression, & Substance Abuse: Selected References and Key Findings* offers guidelines for the aspects of music that will be most effective in trauma. Lower frequency instruments such as the cello are recommended above higher frequency instruments such as the piccolo because they can be grounding and support a state of awareness. Steady rhythms as opposed to changing rhythms will promote regular breathing. Tempos between 60-70 BPM are recommended because tempos much faster or slower can aggravate anxiety. Lastly, the music should be relatively soft so as not to be a stressor.¹²⁷

¹²⁷ *Music Therapy Interventions in Trauma, Depression, & Substance Abuse: Selected References and Key Findings*, (American Music Therapy Association).

APPENDIX A: THE BASIC STRUCTURE OF THE BRAIN¹²⁸

The Central Nervous System (CNS) consists of the brain and the spinal cord, a collection of neural tissue that extends down the length of the spine. This appendix identifies and defines specific areas of the brain that are essential to understanding post-traumatic disorder and its treatment.

Diagram 1: Forebrain, Cerebellum, and Spinal Cord¹²⁹



The **spinal cord** is a collection of neural tissue that is part of the CNS and runs from the base of the pelvis up to the base of the skull.

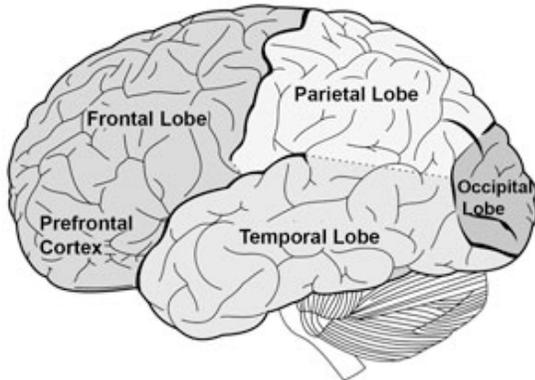
The **brainstem** is at the bottom of the brain and is connected to the spinal cord. This part of the brain is responsible for the most basic survival skills such as breathing, swallowing, vomiting, and urinating.

The **cerebellum** is located behind the brainstem and below the forebrain, and is responsible for coordinated movement and balance.

The forebrain is located above the brainstem. When looking at the forebrain, we see the **cerebral cortex**, the outer layer of brain tissue that forms the surface of the brain. The cerebral cortex is about the size of a sheet of newspaper, but is condensed and folded to be about the size of two fists. It is divided into two hemispheres, which receive sensory information from opposite sides of the body. Each hemisphere is divided into four lobes.

¹²⁸ Gazzaniga, Heatherton, and Halpern.

¹²⁹ Michael S. Gazzaniga and Todd F. Heatherton, "The Cerebellum," in *Psychological Science* (New York: W. W. Norton & Company, Inc., 2006), 122.

Diagram 1: Lobes of the Brain¹³⁰

The **frontal lobe** is responsible for thoughts and for planning movement. The **prefrontal cortex**, located near the forehead, is the part of the frontal lobe responsible for attention, working memory, decision-making, and appropriate social behavior. The prefrontal cortex is especially developed in humans in comparison to other animals. The **olfactory bulb**, responsible for processing smells, is also located in the frontal lobe.

The **parietal lobe** is responsible for the sense of touch and for spatial relations. The **primary somatosensory cortex**, responsible for processing the sense of touch, is located in the parietal lobe.

The **temporal lobe** is responsible for hearing and memory. The **primary auditory cortex** processes sounds and is located in the temporal lobe.

The **occipital lobe** is responsible for vision and is located at the back of the brain. The **primary visual cortex** processes vision and is located in the occipital lobe.

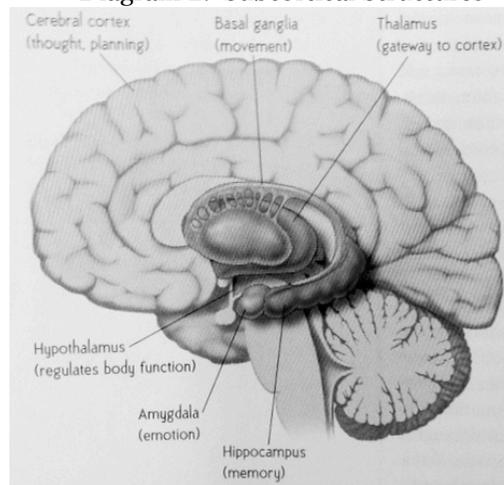
Underneath the cerebral cortex are the subcortical structures:

The **hypothalamus** regulates body temperature, emotions, sexual behavior, and motivation.

The **thalamus** receives visual, auditory, somatosensory, and olfactory input and transmits it to each primary visual, primary auditory, primary somatosensory, and olfactory cortexes, respectively. During sleep, the thalamus blocks incoming sensations from being transmitted to the cortex so the brain can rest.

The **amygdala** processes emotional information and is responsible for associating events with emotional responses.

The **hippocampus** is responsible for formulating new memories.

Diagram 2: Subcortical Structures¹³¹

¹³⁰ Sarah K. Ramowski and Robert J. Nystrom, *The Changing Adolescent Brain*, University of Washington School of Public Health, Northwest Public Health.

¹³¹ Michael S. Gazzaniga and Todd F. Heatherton, "The Cerebral Hemisphere," in *Psychological Science* (New York: W. W. Norton & Company, Inc., 2006), 124.

**APPENDIX B: SELECTED AUDIO AND VIDEO RECORDINGS BY
VETERANS OF THE WARS IN IRAQ AND AFGHANISTAN**

Audio Recordings

- 4th25. *Live from Iraq*. 4th25 Music Group, LLC. CD. 28 March 2005.
- Adam JR. *No Problem*. REDCON-1 Music Group. CD. 15 September 2001.
- Arez. *Bulletproof*. Interscope Digital Distribution. CD. 9 February 2012.
- _____. *Last Call (Beat It) (feat. Cashis)*. Interscope Digital Distribution. CD. 9 February 2012.
- Baghdad Heavy Metal*. MAC3 Artists. CD. 8 July 2007.
- Brown, Nick and JR Schulz. *Iraq Unplugged*. Nick Brown and JR Schulz. CD. 9 November 2005.
- Country, Vol. 1*. To the Fallen Records. CD. 17 August 2010.
- Country, Vol. 2*. To the Fallen Records. CD. 5 October 2010.
- Faces of Freedom – DP*. Dualtone. CD. 6 September 2011.
- Hip-Hop, Vol. 1*. To the Fallen Records. CD. 22 May 2007.
- Hip-Hop, Vol. 2*. To the Fallen Records. CD. 5 October 2010.
- Hobbs, Stephen. *Afghanistan in June*. REDCON-1 Music Group. CD. 15 September 2011.
- Kuzzn Bank. *Ghost of my Past*. REDCON-1 Music Group. CD. 2012.
- Revak, Josh. *Crutchhiker: In the Hours of Darkness*. Josh Revak. CD. 19 April 2012.
- Rock, Vol. 1*. To the Fallen Records. CD. 17 August 2010.
- Rock, Vol. 2*. To the Fallen Records. CD. 5 October 2010.
- Sabo. *Modern Warfare 2.0: Digging in the Crates*. REDCON-1 Music Group. CD. 11 November 2011.
- _____. *A Soldiers Battle Cries*. UTMG/NSA Entertainment. CD. 2011.
- Saunders, Neal. *American Insurgent*. 4th25 Music Group, LLC. CD. 25 April 2011.

- Sgt Dunson. *American Soldier*. Sgt Dunson. CD. 26 July 2010.
- _____. *God Bless America*. Soldier Nation Records. CD. 1 December 2011.
- _____. *Soldier Music*. Sgt Dunson. CD. 8 August 2008.
- _____. *To Hell and Back*. Sgt Dunson. CD. 8 August 2008.
- _____. *War on the Homefront*. Interscope Digital Distribution. CD. 8 August 2011.
- Soldier Hard. *The Deployment*. Soldier Entertainment. CD. 2007.
- _____. *Road to Recovery*. REDCON-1 Music Group. CD. 2011.
- The DoD. *Trading War Stories*. Nonstop Heat. CD. 31 March 2010.
- Thompson, Will. *Baghdad Music Journal*. High Mayhem. CD. 3 October 2006.
- Tracks in the Dust: Songs from Afghanistan*. Independent. CD. 30 May 2011.

Video Recordings

- Dozer. "Infantry Soldier in Afghanistan Makes Music Video." YouTube Video. 7 April 2012. <http://youtu.be/B9Tj5diJHW8> [accessed 5 May 2012].
- Jasonsagebiel. "Two Iraqi Songs: Salvation and Rosary." YouTube Video. 1 September 2010. http://youtu.be/C_wPHa1Gark [accessed 7 April 2012].
- Malibumelcher. "Telephone Remake." YouTube Video. 23 April 2010. <http://youtu.be/haHXgFU7qNI> [accessed 5 May 2012].
- SgtDunsonMusic. "Cost of War – [Music Video] by SGT DUNSON." YouTube Video. 11 November 2009. <http://youtu.be/cLHJ2rtvV4I> [accessed 5 May 2012].
- _____. "PTSD – [Music Video] by SGT DUNSON." YouTube Video. 10 April 2011. <http://youtu.be/6MWrAunJkaE> [accessed 5 May 2012].
- _____. "WAR CRIMES – [Music Video] by SGT DUNSON." YouTube Video. 5 July 2011. <http://youtu.be/ke9-WkZnWEA> [accessed 5 May 2012].
- Soldierhard1. "Soldier Hard 'Can I live Again' (Official Music VIDEO) PTSD US." YouTube Video. 31 October 2010. http://youtu.be/2lto5ADu_QM [accessed 5 May 2012].
- _____. "Soldier Hard 'Road to Recovery' FULL ALBUM SAMPLER Avail 9-11-11." YouTube Video. 19 August 2011. <http://youtu.be/o6btZeWrZeE> [accessed 5 May 2012].

ToTheFallenRecords. "Support Us-Soldier Hard." YouTube Video. 11 December 2007.
http://youtu.be/oV_dJ62hmzg [accessed 8 May 2012].

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<http://www.youtube.com/playlist?list=PLDA45CDDo0B40C55E> [accessed 8
May 2012].

APPENDIX C: SELECTED LIST OF INDEPENDENT READJUSTMENT PROGRAMS

Drum Echoes, <http://www.drumechoes.com>

Matt Giordano founded Drum Echoes in New York City as a way to share the powerful effects that drumming had in controlling his Tourette's syndrome. He offers three programs. In the Drum Circle, participants build energy through drumming and rhythms. In Performance in an Hour, 10-30 participants lean and perform on drums. There is also long-term performance coaching for drumming to build confidence performing for audiences. Given the effectiveness of drumming in alleviating PTSD symptoms, this could be a helpful program for veterans in addition to those with Tourette's syndrome.

Guitars for Vets, <http://www.guitars4vets.org>

Guitars for Vets provides veterans with guitars and six free music lessons. They hope to foster self-expression and the healing power of music to restore the joy and sense of purpose lost after trauma. Private lessons are taught by volunteers and are followed with group sessions.

Iraq and Afghanistan Veterans of America, <http://www.iava.org>

IAVA is the country's first and largest nonprofit, nonpartisan organization for veterans of the wars in Iraq and Afghanistan. With more than 200,000 Member Veterans and civilian supporters nationwide, IAVA is building the next greatest generation with a three-pronged model based on advocacy, awareness, and assistance.

LifeQuest Transitions: Music Camp, <http://www.lqtransitions.org>

A weekend-long workshop in Colorado Springs, CO for veterans to come together, share stories, and write songs. Their songs have been uploaded to iTunes in the album "Faces of Freedom – EP" and a CD will be released soon.

REDCON-1 Music Group, <http://www.redcon1musicgroup.com>

A record label company for soldiers and veterans of the wars in Iraq and Afghanistan. REDCON is a military term short for "Readiness Condition" and is measured in five levels. REDCON-1 is a status of full alert and preparedness to fight.

To the Fallen Records, <http://www.tothefallenrecords.com>

A record label company founded by Operation Iraqi Freedom veteran Captain Sean Gilfillan after returning from the war in 2006. Many soldier-songwriters give up recording their music because they cannot meet the demands of record companies and maintain full-time jobs. Gilfillan founded To the Fallen Records to provide soldier-songwriters with a way to continue recording music on their own time after they return from the war.

Welcome Back Veterans, <http://web.welcomebackveterans.org>

Welcome Back Veterans is committed to providing PTSD treatment to veterans and their families in a public and private partnership with the Veterans Administration, Department of Defense, Major League Baseball Charities, the McCormick Foundation, the Entertainment Industry Foundation and the world renowned Centers of Excellence at University Hospitals throughout the country. Their goal is to provide ongoing treatment to veterans and their families for any PTSD-related issues and to change the way that Americans think and talk about PTSD.

The Wounded Warrior Project, <http://www.woundedwarriorproject.org>

The Wounded Warrior Project works to help physically and mentally wounded veterans recover from the wounds of battle and readjust into normal civilian life. They offer programs for soldiers who have been injured since September 11, 2001 in mind, body, economic empowerment, and engagement. With the understanding that veterans with a good job, good social support, and good routines might be able to transition back into transition life easier, they approach transitional services and mental health therapy from the soldiers' perspective.

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