

ARTIST STATEMENT and RESEARCH BACKGROUND



AMY CAMIE, CCM

“The Healing Harpist” - Certified Clinical Musician – Speaker - Educator

I feel music is a highway capable of bringing what is within the musician out into the world. The energy, feelings, and love flow from the musician and sympathetically resonate within the listener. From this perspective, all music can be healing when we consciously listen and honestly consider how the music is affecting us.

As a classically trained musician, I have personally experienced the expression of music from three distinctly different places of origin: the mind, the body, and the spirit.

Music expressed from the mind begins with active consideration of learned parameters such as key, tempo, and compositional structure to create something specific. Examples of this type of expression could be the creation of compositions from traditional theory and structured forms, intentionally using rhythmic pulses that entrain with the heartbeat or brainwave frequencies, and choosing specific key signatures or altered tunings of instruments to specifically elicit a desired outcome or response from the listener.

Music expressed from the body (heart) begins with a desire to express one’s feelings, thoughts, or insights that emanate from personal experience. Examples of this type of expression could be popular songs of young love and heartache, patriotic songs of strength and courage, or religious songs of hope and renewal. This type of musical expression reflects our human experiences.

Music expressed from the spirit involves the musician getting out of their own way and allowing the music to simply flow through them. This is often referred to as being a ‘channel’ or ‘hollow bone’. The musician’s personal preferences, thoughts, or feelings are not consciously involved in the expression. Examples of this type of expression could be the uninhibited sing-song of children or the improvised jazz of intuitive musicians. It is the melody that “plays the musician” from the inside as if trying to get out - the ceremonial rituals of tribal cultures that passionately demonstrate how the

musician becomes the music and the dancer becomes the dance. The desires and experiences of the "self" dissolve, creating a clear highway of connection to that which is larger than one's self.

These ideas are more fully developed in the article, ["Music as Vibrational Connective Highways"](#)

In 1997, I recorded the CD, *New Love – awaken to yourself*, to help my father relax and heal after prostate cancer surgery. My intention was clear and the expression of music was coming from my heart. Based upon many testimonials from people who listened to this CD, [William Collins, PhD](#), psychologist and neurotherapist, conducted a small pilot study. Here is a summary of that study:

A Quantitative EEG Pilot Study with the "New Love" CD, conducted by William Collins, PhD, indicated the music induced a state of relaxation in 4 minutes by increasing alpha wave and decreasing beta wave frequencies in the brain in 5 subjects.

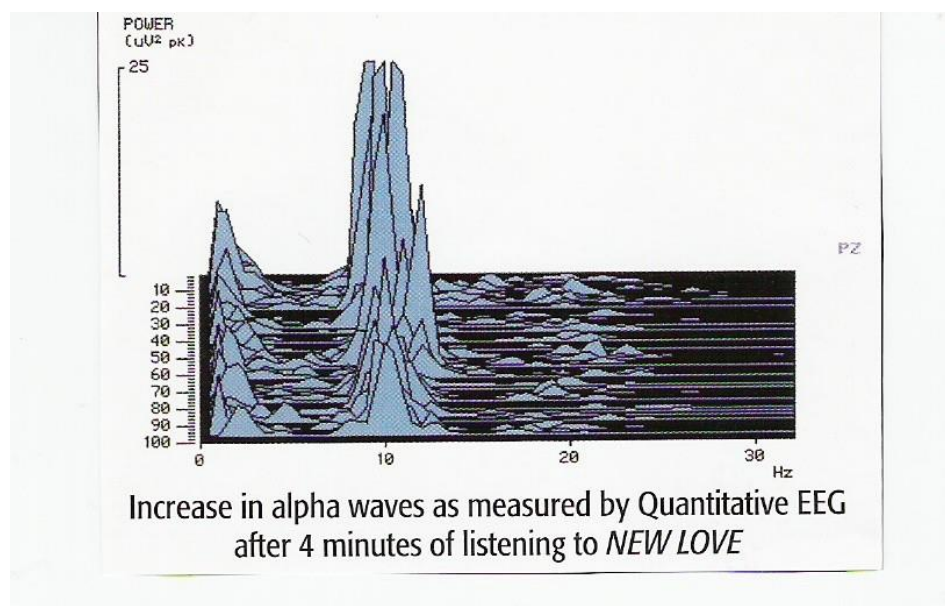
- * A pilot study was conducted of five adults between the ages of 22 and 51 years.

- * Quantitative EEG measurements were taken with the eyes closed without music and then while listening to *New Love "awaken to yourself"* for 4 minutes.

- * Results showed an increase in alpha waves in 100% of the subjects and a decrease in beta waves in 4 of the 5 subjects after 4 minutes of listening to *New Love "awaken to yourself"*. (see graph)

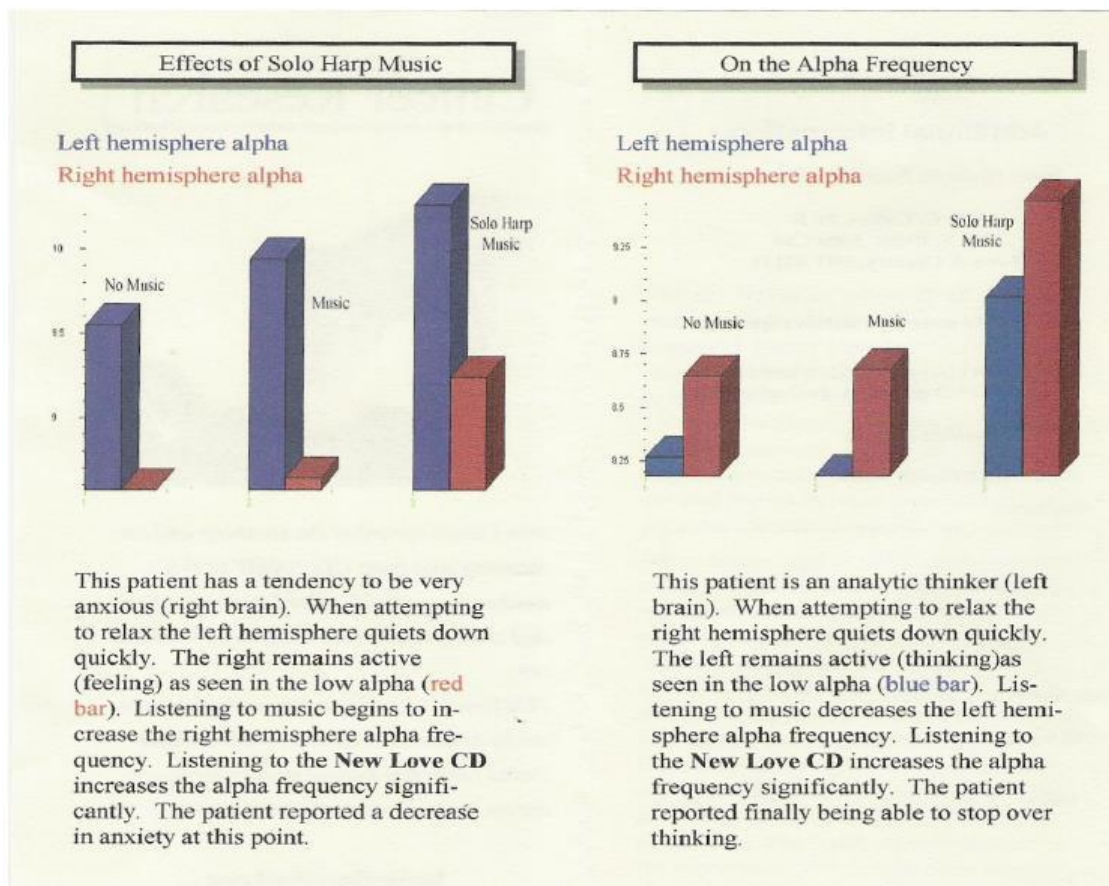
- * Alpha waves are associated with the self-regulation of stress and a decrease in sympathetic nervous system arousal resulting in a state of relaxation.

- * The combination of these two factors (increase in alpha waves and decrease in beta waves) can contribute to increase effectiveness of the immune system



Dr. Collins was curious as to what was happening and conducted another pilot study.

"Effects of the New Love solo harp CD on Alpha Frequency" pilot study indicated the music was effective for both 'right brain' and 'left brain' thinkers as measured by Quantitative EEG.



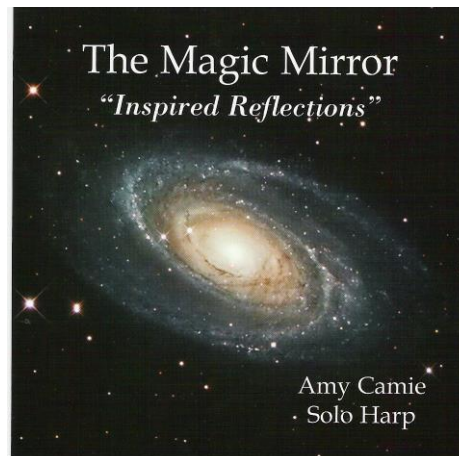
These two pilot studies potentially indicate that my intention to help my father relax was transferred through the music, producing measurable changes in the alpha frequency - the brainwave frequency associated with the self-regulation of stress resulting in a state of relaxation.

Dr. Collins and I hypothesized that if the music could relax and calm the brain in four minutes, perhaps it could have a positive impact on the immune system by supporting its natural internal healing processes.

We, along with helpful colleagues, developed a larger scientific clinical trial exploring the impact of the *New Love CD* on 90 newly diagnosed patients undergoing chemotherapy for breast cancer. After several attempts to work with local cancer centers, it became clear that an independent entity needed to be formed that could develop, fund, and implement forward-thinking studies exploring the value of creative processes, not just music, but all forms of creative expression.

In 2002, my husband and I formed the [Scientific Arts Foundation](#) – a Missouri 501c3 nonprofit organization with an initial 9-member Board of Directors – its mission: to *support research, education and community outreach programs that advocate the value of creative expression as it improves, enhances and enriches quality of life.*

During this time, I recorded [The Magic Mirror – Inspired Reflections](#) CD, inspired by ancient Mesopotamian healing chants my husband shared with me.



I heard melodies from what some would call the muse, spirit, or divine that continuously played like an internal radio. We recorded the CD simply to give the music form. There was no intent, other than to create a clear channel through which this music could flow. I did not create the music; all I did was listen. We knew something was different about this recording based upon testimonials and wanted to explore what those differences could be.

Through the Scientific Arts Foundation, three pilot studies were conducted to explore the effects of *The Magic Mirror* music. Below is the Abstract from our [published paper](#)

Waheed et al. Int J Oncol Res 2018, 1:012
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ORIGINAL ARTICLE

Effect of Specific Music on Psychoneuroimmunological Responses

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Abstract

A pilot study was done to measure quantitative EEG (qEEG) brainwave frequencies and behavioral indices of five women undergoing chemotherapy treatment for cancer, before and after listening to specific music (*The Magic Mirror - Inspired Reflections* solo harp CD written, performed and recorded by Amy Camie) once a day for ten days. Following treatments, the EEG profile for all five participants improved and subjective reports from daily questionnaires confirmed a positive effect of the music.

A further proof of principle investigation of potential effects of listening to The Magic Mirror music on physiological and psychological stress and immunoreactivity was done in ten healthy individuals by measuring biomarkers of physiological and psychological stress (carbonic anhydrase VI (CAVI), IgA, IgG, and α -amylase) in saliva samples that were collected from each individual before and after listening to the 23-minute CD. Additional samples were collected 24 hours later. Secretory IgA, IgG, and CAVI biomarkers were increased in saliva and remained high until 24 hours after music, suggesting The Magic Mirror produced measurable effects on immune response in individuals.

A second proof of principle study looked at the duration of the effects. Similar to the first study, the second study was done repeating the same study design, where levels of secretory IgA, IgG, α -amylase, and CAVI in saliva samples again were shown to increase during and after listening, and these changes persisted for 2-3 days.

These results suggest that listening to *The Magic Mirror* CD produces neurosecretory responses indicative of reduced physiological and psychological stress and may be a useful adjunctive therapy for cancer or physiologically stressed patients.

[Waheed A, Kossor D, Collins W, Camie A \(2018\) Effect of Specific Music on Psychoneuroimmunological Responses. Int J Oncol Res 1:011. 10.23937/ijor-2017/1710011](#)

The brainwave and immune system pilot studies measuring the impact of *The Magic Mirror* on listeners revealed that instead of producing the same effect in each listener as in the previous pilot studies with *New Love*, each listener received exactly what he or she uniquely needed in order to balance brainwaves and support immune system function. Results from these pilot studies create an opportunity to deepen the discussion of how the origination of musical expression affects measurable outcomes in listeners, which is not an often-considered variable in most research to date.

From my perspective, *The Magic Mirror* is a clear highway devoid of my personal thoughts, feelings, or intentions - allowing the transference of whatever energy best supports the listener.

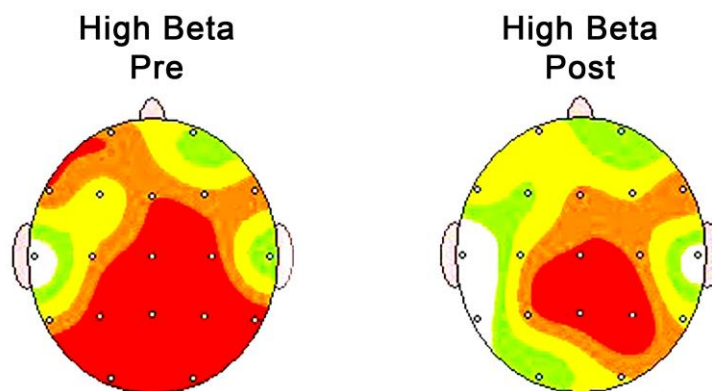
For example, in the graph below, you can see how every subject began with different baseline frequencies and yet all subjects experienced the change necessary to improve or normalize that specific brainwave frequency. It is almost as if they were receiving individualized music. I believe this is the power of a clear highway without a personal intention or attachment to a specific response from the listener.

Red = significant deviation from the norm

Green = a statistically positive change or normalization.

TBI Index (Mild Traumatic Brain Index)

| Subject | Delta | Theta | Beta | High Beta | TBI Index |
|----------|----------|------------|------------|------------|-----------|
| 1- Pre | elevated | deficit | elevated | elevated | No |
| 1- Post | reduced | improved | normalized | reduced | No |
| | | | | | |
| 2- Pre | elevated | elevated | deficit | elevated | Yes |
| 2- Post | reduced | normalized | improved | same | No change |
| | | | | | |
| 3 - Pre | | | elevated | elevated | Yes |
| 3 - Post | | | reduced | reduced | improved |
| | | | | | |
| 4 - Pre | | deficit | deficit | deficit | Yes |
| 4 - Post | | normalized | normalized | normalized | improved |
| | | | | | |
| 5 - Pre | | deficit | deficit | elevated | Yes |
| 5 - Post | | normalized | normalized | reduced | No change |



Based upon the above QEEG and saliva sample pilot studies, we amended the Scientific Arts Foundation's developing clinical trial to include *The Magic Mirror* CD rather than the *New Love* CD, and authored the multi-site study, "*A Randomized Study of the Effects of Two Relaxation Music CDs on Stress Factors in Adults Receiving Chemotherapy as Treatment for Cancer*".

This innovative study was approved by St. John's Mercy Medical Center's Institutional Review Board, St. Louis, Missouri in August 2007. The protocol includes neurological, biological, standardized psychological, environmental and quality of life measurements that address the whole person - their belief systems, perceived support systems, sleep patterns, and musical preferences.

August 14, 2007

John Eckardt, MD
12855 North Forty Drive
Suite 200
St. Louis, Mo 63141

RE: The information we received August 9, 2007 regarding study number 07-119: A Randomized Study of the Effects of two Relaxation Music CDs on stress Factors in Adult Cancer Patients Receiving Chemotherapy as Treatment for Cancer (None)

Dear Dr. Eckardt:

I have reviewed your request for expedited approval of the new study listed above. This type of study qualifies for expedited review under FDA and NIH (OHRP) regulations.

This is to confirm that I have approved your application. The protocol is approved through Version dated August 2, 2007. The data set associated with this study is considered identifiable. The consent form dated 7/30/07 is now also approved. You must obtain signed written consent from all subjects. In reviewing your consent procedure for this study, your inclusion of the following special classes of subjects was taken into account: physically disabled/challenged; women with reproductive potential; men with reproductive potential; ethnic minorities; patient with diagnosis; elderly or aged (65 years or older).

You are granted permission to conduct your study as described in your application effective immediately. THIS LETTER IS ALSO YOUR NOTICE TO SUBMIT FOR CONTINUING REVIEW ON OR BEFORE August 13, 2008, unless closed before that date. Please see the IRB Policy and Procedure Manual for future reporting procedures and IRB forms.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Penny Yarber (314-251-6841) if you have any questions or require further information.

Sincerely,



Donald York, Ph. D.
Chairman, Institutional Review Board

This clinical trial was never implemented due to the inability to raise the necessary funds prior to my first of two breast cancer diagnoses.

I personally listened to *The Magic Mirror* CD twice a day upon my diagnosis of Stage 2 breast cancer and continued listening every day during my treatments.



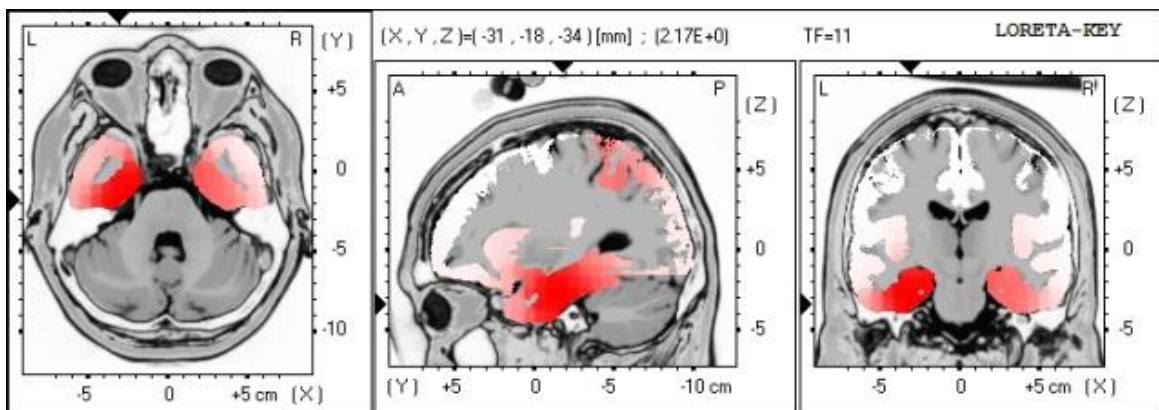
Dr. Collins measured my brainwaves twice using QEEG – once at the end of six rounds of chemotherapy and again one week after completing 33 radiation treatments.

Dr. Collins commented:

In the second QEEG, we see an improvement in cognitive function despite the fact that we would expect to see more cognitive deficits than the previous QEEG.

In the second QEEG the increase of alpha frequency was being generated by the parahippocampus (Brodmann 28 area) which is a deep center of the brain and part of the emotional memory system. This is a clear indication of the music affecting deep centers of the brain.

The image below shows the source location for the generation of the Alpha frequency in the second QEEG recording. This system of analysis is done by a program called LORETA (Low Resolution Electromagnetic Tomography). It is a complex analysis of EEG placed over an MRI template in order to locate the source of any cortical EEG. The specific regions of the brain involved in this source location of the parahippocampus (Brodmann 28) is part of the emotional memory system.



I believe music from *The Magic Mirror* CD reached deep inside my brain and positively impacted my emotional memory system which helped to prevent any symptoms of cognitive deficits or 'chemo brain'. I posed the question to Dr. Collins and this was his response:

Q: Does *The Magic Mirror* help to reduce the impact of chemo brain, fatigue, stress and anxiety?

A: It would require further investigating to unequivocally determine that *The Magic Mirror* is in fact reducing the impact of these things, however the evidence shows it does allude to the reduction in symptoms.

In 2018, [Anu French, MD](#), a Fellow of the American Academy of Pediatrics and a Member of the AAP's Pediatric Integrative Medicine Leadership Initiative, contacted me to help design a pilot study using *The Magic Mirror* CD with her patients. The findings were presented at the American Academy of Pediatrics National Conference & Exhibition in Orlando, Florida, USA in November 2018.



A pilot study on 'The Magic Mirror' harp music as a cost-effective biofeedback/neurofeedback tool to build intergenerational resilience.



Anu French MD FAAP ABoIM Pediatrics and Integrative Medicine, SSM Health Cardinal Glennon Pediatrics
Kristy Shaughnessy BS MS Human Biology, Performance and Nutrition, Logan University, William Collins PhD, BCN Board Certified Neurotherapist, Collins and Associates

Introduction

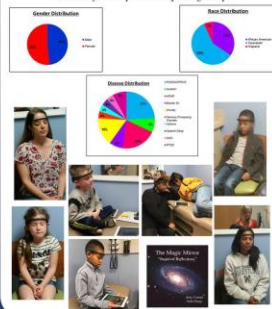
Current neurofeedback/biofeedback resources are expensive and not widely available.
The Magic Mirror harp CD written and recorded by harpist Amy Camie, has been shown to have a positive impact on brainwave frequencies and immune function.¹
A systematic review of the psychoneuroimmunology of music reveals a range of effects including healthy heart rate variability and blood pressure and decreased levels of cortisol and interleukin-6.²
Through biofeedback/neurofeedback, the capacity to rewire brains shows how children and adults who have experienced *Adverse Childhood Events/Experiences* (ACEs) can learn to regulate themselves.³

Building intergenerational resilience can reverse the negative psychosocial and neuro-immunologic effects of toxic stress.⁴

Hypothesis

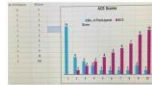
- Listening to *The Magic Mirror* harp music will show:
1. Improved states of focus and relaxation as measured by the MUSE app.
 2. Calmer brainwave neurofeedback patterns as interpreted by the Muse Monitor app.
 3. Improved intergenerational resilience scores and improved sleep, focus and mood as measured by Resilience and Quality of Life Questionnaires.

A flyer was posted in our office inviting families to participate in the study and 25 parent/child pairs signed up.



Methods

- The AAP/SSM grant was used to purchase the MUSE Headbands, the MUSE monitor app, the iPad, the WiFi hotspot, the CD players/headphones, *The Magic Mirror* CDs, and cover the cost of all the forms.
- At the first visit, informed photo consent was obtained and the ACE/Resilience Questionnaires were filled out in the office.



- The parent/child volunteers were then administered a MUSE headband biofeedback session in the office (per harp music).



The MUSE headband is a guided meditation biofeedback device. During the biofeedback session, the MUSE app provides audio and visual feedback.⁵
The MUSE Monitor app records brainwave neurofeedback patterns during the MUSE sessions. It was designed to give easy access to EEG data for neuroscience research.⁶

- A CD player with *The Magic Mirror* music, listening instructions, and a daily log sheet were loaned to each family to take home for 2 weeks.



- The parent-child pairs returned to the office, were administered a follow-up MUSE headband biofeedback session (post harp music) and Resilience/Quality of Life questionnaires were filled out.
- 14 Parent/child pairs and 1 parent completed all parts of the study (29 participants)
- The questionnaires and the MUSE monitor data was reviewed and analyzed.
- Attrition was due to parent illness, child illness, and no shows for follow up appointments.

Results

The MUSE App Measured:

- Number of Calm points (change from active to neutral representing effort spent noticing distractions and building attention skills)⁷

- Number of Blobs (which land neatly when one is calm for a longer time (tends to improve HRV)⁸

MUSE 60-90 second pre and post harp sessions did not show statistically significant changes.

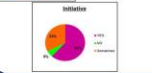
We took into account the fact that the MUSE calibrates for the moment.

We did see some positive changes in 8 of the 29 participants.



Self-reported results showed statistically significant changes

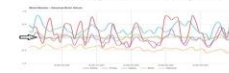
Improvement in Measures of Resilience



Improvement in Measures of Quality of Life

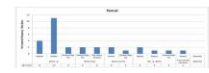


The MUSE Monitor App collects raw EEG data and breaks it up into the 5 brainwave patterns⁹



Neuro-therapist, Dr. Collins' analysis of the a EEG-MUSE Monitor Data

- Pretreatment (harp music) frequencies showed abnormally high Delta which is generally reflective of fatigue, head injury, chronic illness, learning problems and severe ADHD.¹⁰
- When pretreatment Delta waves were high, then the Beta 1 waves went down post treatment (harp music).



- Having too much Beta leads one to experience stress, anxiety, and the inability to relax.¹¹

- Beta waves went down in 72% of the participants (significantly in 17/29 (59%)

- moderately in 4/29 (13%).

Gender was not a factor.

- Beta 1 waves going down which relates to a calming of the EEG (brainwaves).

Conclusions

Listening to *The Magic Mirror* harp music showed

- Improved states of relaxation as measured by the MUSE app but was not statistically significant.
- Improved Emotional Control, Ability to Focus, Quality of Sleep, Ability to Relax measured by QOL questionnaires
- Improved measures of Resilience (Initiative, Internal Beliefs, Relationships and Self control) measured by Resilience questionnaires
- Calmer brain wave neurofeedback patterns on the MUSE Monitor app as interpreted by a neuro-therapist.

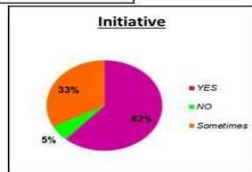
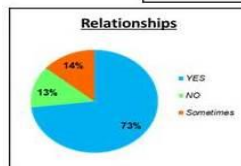
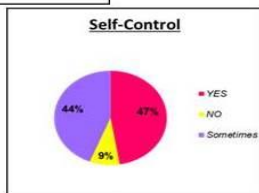
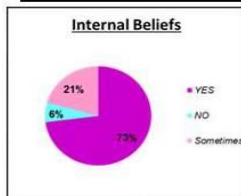
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prepared by: Dr. Anu French, MD, FAAP, ABoIM, SSM Health Cardinal Glennon Children's Hospital

Self-reported results showed statistically significant changes

Improvement in Measures of Resilience



Improvement in Measures of Quality of Life



Below is a quote from Dr. French after her presentation:

"Our pilot study on *The Magic Mirror* harp music (by Amy Camie, Harpist) as a cost-effective biofeedback/neurofeedback tool to relieve stress, build intergenerational resilience and teach self-regulation, was well received at the AAP's Section on Integrative Medicine Session! Thanks to SOIM research grants from the AAP/MPPPA and hard work by Kristy Shaughnessy, our wonderful research assistant, we showed positive outcomes in resilience and QOL (quality of life) scores and calming of QEEG brainwave patterns supporting our hypothesis that this healing music by Amy Camie has powerful psychoneuroimmunological effects to help reverse inflammation/toxic stress."

[More information](#)



The Therapeutic Harp Music Study at Siteman Cancer Center

Most recently, I collaborated with a research team to develop another clinical trial, "*The Effect of 23 minutes of Distinctive Therapeutic Solo Harp Music on Anxiety in Newly Diagnosed Adult Patients Scheduled to Receive Chemotherapy Treatment for Cancer: A Feasibility Study.*"

In December 2019, this research received IRB approval through Washington University School of Medicine in St. Louis, Missouri, USA and would have been implemented at Siteman Cancer Center in St. Louis; due to lack of funding, it was closed on October 15, 2021.

In addition to the above studies with *The Magic Mirror*, beginning August, 2007, I played a small therapy lap harp at St. John's Mercy Medical center every week for 1 1/2 years for inpatients on the oncology floor as part of the hospital's Healing Therapies Pilot Study Program. Documenting pre- and post-pain and distress levels, 99% of responses from patients indicated less pain and distress after 10 minutes of live harp music, with a majority of the patients asleep within 4-5 minutes.

Also in 2007, a quantitative EEG pilot study was conducted by [William Collins, PhD](#) with *DREAMS-the love within* solo harp CD that indicated the music produced a relaxed mental state in all 5 subjects measured.



The design of the study involved three separate QEEG data recordings. Subjects were given a pre and post Q along with a measurement recording while listening to the solo harp music for 27 minutes. The clearest and most significant changes were noted during the listening of the solo harp music. In all five subjects the dominant brainwave frequency was in one of the two central relaxed frequencies. The first was the high alpha frequency, between 11 and 12 hz and the second was the SMR (Sensory Motor Response) frequency between 12 and 15 hz. The high alpha frequency is associated with focused relaxed attention and the SMR frequency is correlated with muscle relaxation.

My passion is to continue expanding the conversation and awareness of the power of music. There is a healing quality and value in all music because it is an expression of someone's thoughts, emotions, and spiritual connections. As human beings, we are intimately connected to one another. Music has the potential to create bonds that release fears, repair misunderstandings, and restore hope - healing and unifying our mind, body, and spirit.

Music is a universal language, but only to the extent we are willing to express it honestly and listen consciously. Conscious listening, along with honest feeling, provides an opportunity for compassionate healing. Much more than background ambiance, daily entertainment or a temporary diversion from reality, music is a vibrational connective highway which has the potential to unite and heal the world from the inside out. It is up to us as musicians and listeners to make that so.

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