Frequency And Modern Dance

AP Research

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A Brief History of Sound and Movement Therapy

The history of Sound and Dance/movement therapy traces back to World War 2 in 1939-1945. Meanwhile, the Great Depression was also in effect in America. During this period, many Americans had massive levels of stress from America going into an economic recession while millions of soldiers fought the Axis powers. Imagine if that was your bank account that was wiped out. Your husband was fighting in Germany? Or even constantly hearing on the radio that America is losing money expeditiously? You would panic. And that is what the Americans did. Specifically, between 1928 and 1932, “the suicide rate rose more than 30 percent”(Thompson School District). And in terms of the military population, out of the soldiers that survived and returned many have experienced stress and; worst of all, post-traumatic stress disorder. In a specific research group, 54% of a group of psychiatric patients that was in World War II combat “met criteria for PTSD” (Rosen et al) Better known as Post Traumatic disorder: a mental disorder that still is researched today. In such a country with mentally disordered soldiers alongside citizens with economic distress, America was under the umbrella of high levels of stress.

In this exigence, this common emotional stress caused psychological professionals to interfere; and relieve this strain commonly induced on Americans. Because of this, the idea of mental health became embedded and discussed in human conversation, professions, and even lifestyles to the point where multiple versions of therapy were created... Two of many therapies that were created and evolved (in the 1940s): Dance/Movement Therapy/DMT (ADTA) and sound therapy(AMTA).

Dance Therapy

Dance therapy is a "psychotherapeutic use of movement to promote emotional, social, cognitive" of the individual(ADTA). It was created in the 1940s by Mary Catherine Ritzer while working at a psychiatric hospital in Ohio (ADTA). A key aspect of this method is that patients are exposed to music, which helps reduce stress levels and encourages patient cooperation and relaxation. Eventually, they can also create their own music, or even create new dances! Along the timeline of important American Events, Dance/Movement Therapy has continued to improve. This improvement has continued so much that dance has become an advocator of reducing stress, increasing levels of serotonin (happiness hormone), and even improving humans neurologically (Tayor and Francis). This therapy method typically consists of maybe 45 minutes, five times a week. Dance therapy consists of the dance genre called "Improvisation¨" better known as freestyle.

Looking Deeper into the Biological Effects of Sound to Cause Calmness

On the other hand, music therapy is the concentration of singing, playing, and listening to music. As specifically created for soldiers, the exact therapeutic monumental moment was when it was first used by the "United States War Department in 1945" for a mental and physical rebound. But this method can also apply to many other groups: People with Autism Spectrum Disorder (ASD), Alzheimer's disease, Victims of trauma and crisis", and many more (Cleveland Clinic). To add on, scientists have acknowledged the strength of Music therapy to the point of it being proven to decrease stress in children before surgery (Salamon, Elliott, et al).

But music is an umbrella term for "vocal, instrumental, or mechanical sounds having rhythm, melody, or harmony"(Merriam-webster Dictionary). So, in this specific experiment, we will focus on the instrumental sound of frequency that results from the pattern at which a sound

wave occurs. Scientists Kaho Akimoto and Ailing Hu, Department of Hospital Administration and employee at the Center for Advanced Kampo Medicine and Clinical Research, discovered that “tension-anxiety and total mood disturbance scores were significantly reduced after exposure to 528 Hertz music” (Akimoto, Kaho, et al.).

Modern Dance is an Artistic Addition to Dance Therapy

Modern Dance (20th century-present) is a dance genre that focuses on the expression of the dancer. Meaning, that Modern dance’s purpose is to display emotion, thoughts, and the artistry of the performer. As described by Modern Class, this genre “ challenges the structured dance technique of classical ballet” as it follows synchronized “technical positions” (MasterClass).

Not too long after this dance genre was created, there were techniques developed under this genre. What’s specific about these techniques are the poses and how fluid or technical they may be. For example, one technique may require the perfection of lines while another just focuses on undulation (movement of the spine). One of these undulating techniques in this experiment is called the “Graham Technique”. This technique that has heavily influenced the Modern Genre was developed by an artist named Martha Graham during the 1920s-1930s.

(Martha Graham). Martha Graham’s dance technique was to reveal the intricacies of human emotion. These collections of “sharp, angular, jagged, and direct" poses have continued to inspire many dancers decades later. Giving dancers the gift of fusing emotion and modern dance technique.

Whereas, another artist by the name of Lester Horton also created a technique in the 1950s named the “Horton Technique” (modern genre). Before his death shortly after his creation, he came up with a series of technical terms, better known as Fortifications. Examples such as

“Torso Language, Pelvic Actions, Aerial Vocabulary”, and more. This modern technique highlights the movement of the torso, the spine, and the pelvis. When creating this technique, he wanted to test the dancer´s ability to interact with “strength, endurance, and limitations of the human body” (Enache). In other words, Horton's technique is a huge test of the dancer´s overall hardiness in the beautiful art form of Modern dance.

With this knowledge of the genres, the prediction of my experiment is that Martha Graham's technique of 528 hertz will cause more happiness for Phoenix Dance Ensemble. Simply because they have more experience with the genre in their routines. And such familiarity with something “increases positivity” since the thought of a negative outcome is absent (Zajonc, 2001).

Literature Review

My topic focuses on the frequency of 528 hertz, and its contribution to calmness/relaxation, unlike sources that just focus on dance in general. Therefore, I will be doing an experiment to view the level of calmness of people only listening to 528 hertz and performing modern techniques to this frequency. But why the frequency of 528 Hertz?

According to Japanese research scientists of medicine, 528 Hz frequency lowers mean levels of cortisol causing an “especially strong stress-reducing effect” (Akimoto, Kaho, et al). In other words, after a few minutes of listening to this very frequency, one’s amount of stress hormones decrease. And such findings are so significant since multiple participants in their adult years (26-37 years) can experience this lowering of stress because of this music. With the previously accumulated worries from bills, jobs, and even more adult responsibilities, such

music gave the participants a mental pause from that. Consequently, 528 hertz was proven by a recent experiment that can alleviate one from the reality of mental strain.

Now discussing the common experimental variable of relaxation, the purpose of this paper's experiment is to combine both 528-hertz music and modern dance techniques. Ultimately, leading to the emotional feeling of calm. Specifically, through Martha Graham's technique, multiple moves involve movements of contraction and release. In other words, the dancer will strongly pull back and curve the torso inward or outward (Martha Graham).

This same move is shown in the Horton technique as well. It has been seen most clearly in Alvin Ailey's work, Horton's Student, that choreographed masterworks like *Revelations* and *Cry*. As *Cry* had the powerful theme of physically showing the struggles of black women in the slave trade, this message was brought across through the dancer's use of contractions, arched movements, and curves to convey her pain in the first section of the dance (Geneseo).

Obviously, there is a trend of the contraction movement in modern dance that has the effect of abdomen muscles that are "coupled with an exhalation" (Giguere). Examining further into autonomy, when a person breathes in and out, their diaphragm contracts and moves downward; according to the National Heart, Lung and Blood Institute (NHBL) . research concludes that any breathing practice which is referred to as "diaphragmatic breathing" is an efficient method. It is an "integrative¨" body and mind connecting exercise that deals with stress (Nih).

Given the common experience of calmness through frequency and dance, I have decided to write this academic paper that can merge those two variables together which is lacking in most studies. This will fill the gap of separating science and fine arts as if they are completely different societal gifts. Whereas, this article will spark the conversation that science and dance

inevitably will work together to produce the art of dance through this experiment on Phoenix Dance Ensemble. Purposefully, will be listed in methods.

Method & Rationale

The methods that I will use to find data for my research topic are quasi-experiments and a survey. In addition to using research data from sources such as academic articles by authorial dancers and research articles about Martha Graham/Lester Horton, I am using data from quasi-experiments that my participants will go through in order to take a survey. The data and information I intend on receiving from these experiments and survey combination methods to answer: *which technique to 528 Hertz promotes even more calmness for my public school dance company: Martha Graham Technique or Lester Horton?* I chose this method to present quantitative and qualitative data because I want that combination to strengthen these results; especially when I am closing a gap between the fine arts and sound. As the quantitative data from the survey is important, the need for the words of these participants is very important since the effect is the feeling of calmness; and it is always more powerful to receive knowledge of their emotions and descriptions of feelings. This would allow participants to type out their feelings.

Arguably, this is the best method for this project since there is little to no current research about how frequency and dance genres can affect the emotions of a dancer. And with this absence of research concerning this discipline, there is no observational, correlational, or content analysis I can do. Therefore, those methods weren´t and couldn´t be chosen since they were nowhere near the best methods for this project. Consequently, I as the researcher have to create my own data to fulfill the answer to the research question.

Participants

I will be conducting my survey and experiment among all of my classmates and the dance company at my public high school. The point of this is to get 3 things: How calm they felt while listening to 528 hertz alone, their calmness level with the Martha Graham technique, and their calmness level with Lester Horton Technique. There are 26 teenagers in the company that range from the ages of 14-19. All Phoenix dance ensemble members had access to my survey after the experiment. It has been shared via email and I will be getting their consent to use their data by asking willing participants to sign a consent agreement.

Materials

I created my survey using google forms. It included 4 different sections, how people were before listening to 528 hertz, listening to 528 hertz, and dancing with Martha Graham/Lester Horton to 528 hertz. This range allows for data comparison between the before and after effects. The goal is to see an improvement in their calmness (data received from the survey) from before 528 hertz to after dancing to it. In order to know how people were doing, I asked questions about how their day/week was and how they felt on the day of the experiment on a scale of 1-10. Later, the data will be interpreted by reviewing how healthy people are reported to be. This is my survey:

https://docs.google.com/forms/d/e/1FAIpQLSdEAU3LA5HVPFhJEdNhV09F5i9FDAK4vFinVQd_Wz5ZRSGPVg/viewform?vc=0&c=0&w=1&flr=0

1. How calm did you feel after listening to 528 hz (the music)?
2. How calm did you feel while doing Martha Graham to the music? (First routine)

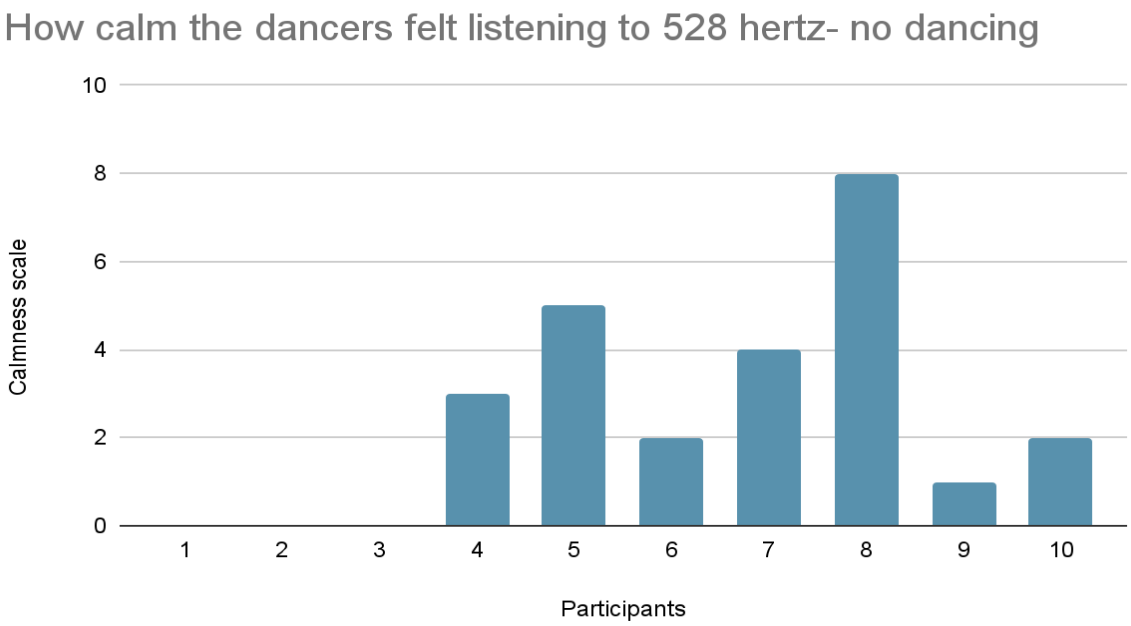
3. How calm did you feel while doing Lester Horton's technique to the music? (Second routine)
4. All questions shall be ranked on a number scale of 1-10. 1 meaning chaotic, 10 meaning calm.
5. Which routine made you feel more feelings of calmness/relaxation? *
    a. 1st routine: Martha Graham
    b. 2nd routine: Lester Horton

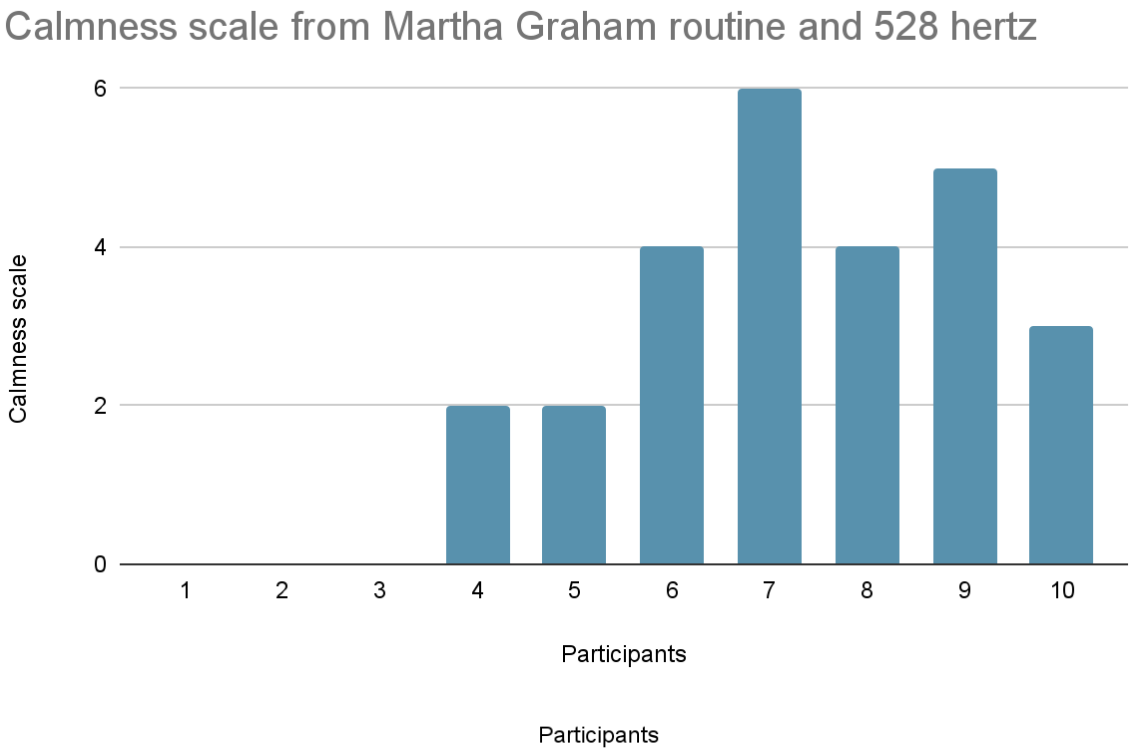
My survey will be sent out via email immediately after the survey on February 22nd. I will also send a reminder for participants to take the survey right after the experiment is done so they will not forget their feelings. That survey will be closed at 11:59 pm for the most accurate results.

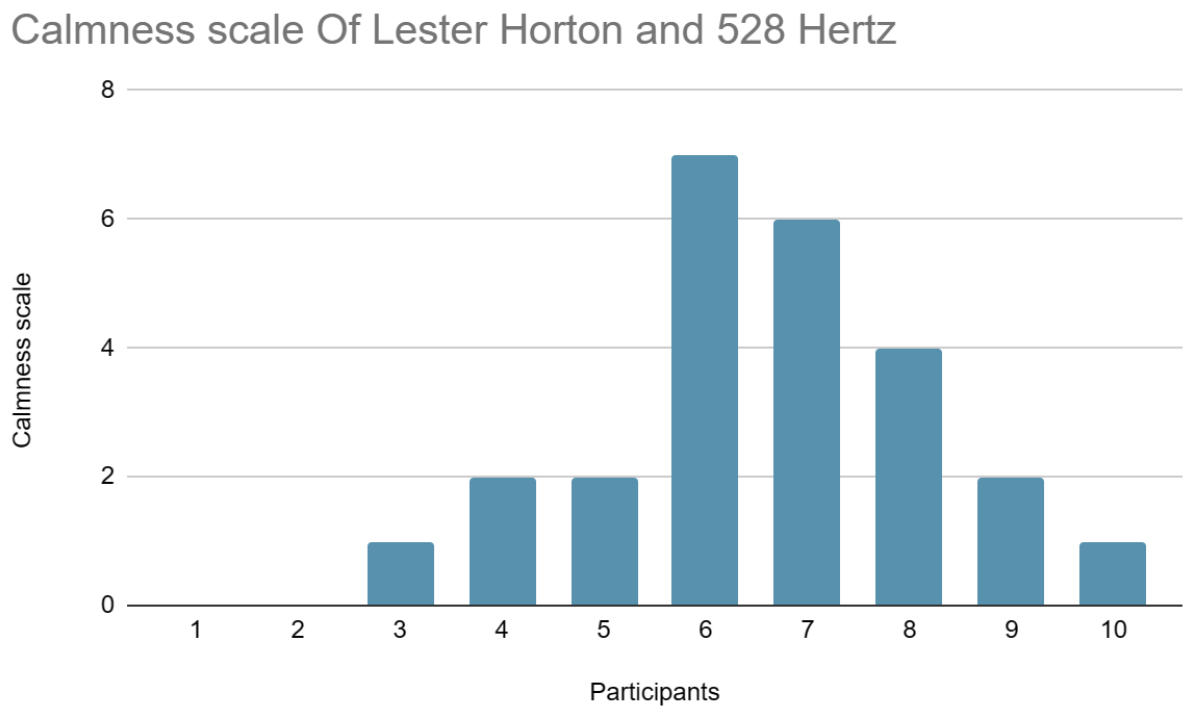
To start this experiment, I will Collect how the participants feel before hearing 528 hertz. This will occur with them doing the 1st question of the survey: “How calm would you say you were before the experiment?” After answering this question on their computers, they will allow their computers to sleep as they participate. Now, the Participants will be in their most comfortable position on a yoga mat and listen to 528 hertz for 10 minutes; it will play through the speakers.

After this 1st part is done, the participants may stand in 3 rows as I teach them the Martha Graham combination (minute in length). After they learn this combination, which is pretty beginner, I and them will do the routine to the 528-hertz track that was recently played; half the class at a time. Next, repeat the teaching method for Martha but instead with a Lester Horton combination/routine. Afterward, we may gather in a circle as I thank them for participating in the experiment and now complete the survey in the given time left. Will announce that surveys are 100% due by the end of class.

Results


How calm the dancers felt listening to 528 hertz- no dancing
Calmness scale
0
2
4
6
8
10
1
2
3
4
5
6
7
8
9
10
Participants


Calmness scale from Martha Graham routine and 528 hertz
Calmness scale
0
2
4
6
1
2
3
4
5
6
7
8
9
10
Participants
Participants



	Pre- experiment	528 Hertz	528 Hertz+ Martha Graham	528 Hertz + Lester Horton
Average	5.03	6.8	7.3	6.6
Median	5	7	7	7

After calculating the average of all four data graphs, the average calmness scale before the experiment was 5.03, after hearing 528 hertz (no dancing): 6.8, 528-hertz frequency with Lester Horton: 6.6, Martha Graham and 528 hertz: 7.3. Evidently, the calmness scale or feeling of relaxation had increased overtime throughout this experiment. The increase from before the experiment to either modern dance technique was at least 1.57 points. For an experiment with 26 participants with unique and intricate feelings, this increase is powerful. Because as predicted, combining modern dance with calming frequency has caused an increase in calmness for the

high school participants. Therefore, the data provided answered the research question because it shows Martha Graham's technical movements causing more calmness with the 528-hertz frequency.

Further examining relationships, the relationship between sound frequency and calmness, the 528 hertz has caused a higher level of the feeling of tranquility. The average calmness scale has increased by 1.72 points: without the variable of dancing. Now examining the relationship between the Martha Graham technique and 528 hertz, the average calmness scale has increased by 2.22 from before the experiment: the increase for the Lester Horton technique was 1.52 points.

Therefore, the conclusion of Martha Graham's techniques with this sound frequency causing more calmness is based on a pattern of the average calmness scale increasing more than the calmness scale of Lester Horton. Further examination, means that the majority of the participants collectively had a higher rating for how relaxed they felt with Martha Graham's technique. Especially since 73.1% of the participants preferred the Martha Graham technique.

As the data does answer the question, there was room for growth in this experiment. A specific limitation was that there was only one dance group in this experiment and survey. Seeing similar results of people reaching the feeling of calmness from multiple dance companies of different ages will strengthen such an argument: additional qualitative and qualitative data will prove to the professional dancers and scientists that this effect is deemed more factual. This would have allowed more results to be more well-rounded and more representative of the whole dance community at public charter schools. My findings would have been more vigorous and my conclusions would have been.

In terms of flaws in the design may have been the actual speaking of guiding them through the techniques: “plie and exhale” for example. As I reminded them to breathe in and out, this would have encouraged more feelings of calmness compared to no guiding words. Because sometimes dancers tend to forget to breathe as they dance causing this uncontrollable heavy breathing by the end of the routine. As Martha Graham’s technique would have still been the winner of causing more calmness, without my guiding words would have just caused a slightly lower average than 7.3.

Conclusion

Examining the data given to us from the experiment, the calmness level greatly increased after simply listening to the frequency for 10 minutes. 10 minutes! And the calmness level was higher with Martha Graham's technique compared to Lester Horton's. But only by the slightest change in the calmness levels of this foundation. Both techniques produced very similar findings of average calmness levels as they were constantly reminded to focus on their breath. And discussion-wise, to answer the last question as to why this specific genre produced more calmness for them: most contained the theme that they were more comfortable with the movement of Martha Graham than Lester Horton as hypothesized.

The specific audience that this research is about is dance therapists, dancers, or even scientists. The research results in giveaways to encourage the topic that dance and frequency can cause calmness in people which will create another path for people, interested in both topics, to achieve positive subjective well-being. Yes, calmness was the dependent variable of this finding but the consequential message for anyone interested in dance, sound or both is that we as fine artists have the tools to give us feelings of calm or joy.

Such a discovery with the exigence of our world being newly post-covid, any findings to give someone an answer of better subjective well-being so valuable, to their mental health but also their heart. Quarantine for a year embedded in isolation has created a long-term problem in the quality of one's mental health to decrease. So, according to the data, any dancer or person interested in sound healing can use their tools of sound and/or movement here and there to better their mental health. This research provides an insightful solution by mentioning mentally beneficial exercises of dance and sound that train the mind to be closer to calmness or even exceed happiness.

But this message cannot come across alone. More innovators can perform a similar experiment to provide similar data but with different variables: different genres, different frequencies, and different participants. This quick class experiment can be done at other schools; more preferred high schools and colleges. This research would not only implicate that the fine arts can contribute to better mental health, but the number of experiments will also implicate how significant this is. If there is a "trend" of these experiments across these dance companies, this quantity of dancers saying how these experiments made them feel calmer or happier can inspire the development of DMT therapy.

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