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Meditative Music as a Method for Stress Reduction, Relaxation, and Focus Enhancement

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Master's Degree Thesis

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Abstract
This study explores the role of meditative music in promoting relaxation, stress reduction, and focus. Meditative music, with its slow tempos, repetitive structures, and gentle, harmonious tones, is recognized for fostering mindfulness by minimizing mental distractions and encouraging present-moment awareness. The study focuses on how meditative music affects the brain's default mode network (DMN), a neural network associated with self-focused thought and rumination, and highlights that reducing DMN activity, a key outcome in mindfulness practices, correlates with reduced stress and improved concentration.

This research also examines how specific musical structures and frequencies facilitate relaxation through brainwave entrainment, where brainwave activity aligns with external frequencies, shifting listeners toward alpha and theta states linked to relaxation, creativity, and enhanced focus. Instruments like singing bowls, gongs, and handpans are analyzed for their unique acoustic properties that promote deep relaxation and mental clarity.

The practical component involved creating and analyzing original meditative compositions designed with minimalistic, repetitive structures, stable harmonies, and natural timbres, using instruments such as the shruti box, handpan, and singing bowls. The compositions were developed through live improvisational sessions, beginning with the "OM" mantra to establish performer cohesion. The study validates meditative music's potential for therapeutic use, offering insights for future research on the specific elements and frequencies that enhance its effectiveness in therapeutic and meditative contexts.

Language: English
Key Words: meditative music, mindfulness, relaxation, brainwave entrainment, stress reduction

EXAMENSARBETE

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Abstrakt

Denna studie undersöker rollen av meditativ musik för att främja avslappning, stressreduktion och fokus. Meditativ musik, med sitt långsamma tempo, sina repetitiva strukturer och mjuka, harmoniska toner, främjar mindfulness genom att minimera mentala distraktioner och uppmuntra närvaro i nuet. Studien undersöker hur meditativ musik påverkar hjärnans default mode network (DMN), ett neuralt nätverk kopplat till självcentrerade tankar och ältande. Den framhåller att minskad aktivitet i DMN, ett centralt resultat av mindfulness-praktiker, är associerat med lägre stressnivåer och förbättrad koncentration.

Forskningen undersöker även hur specifika musikaliska strukturer och frekvenser underlättar avslappning genom hjärnvågsentrainment, där hjärnaktivitet anpassar sig till externa frekvenser och förflyttar lyssnaren mot alfa- och theta-tillstånd som är kopplade till avslappning, kreativitet och förbättrat fokus. Instrument som sjungande skålar, gongar och handpans analyseras för deras unika akustiska egenskaper som främjar djup avslappning och mental klarhet.

Den praktiska delen innefattade skapandet och analysen av originella meditativa kompositioner, designade med minimalistiska, repetitiva strukturer, stabila harmonier och naturliga klangfärger, med användning av instrument som shruti-box, handpan och sjungande skålar. Kompositionerna utvecklades genom liveimprovisation, som inleddes med mantrat "OM" för att skapa samhörighet bland musikerna. Studien bekräftar den meditativa musikens terapeutiska potential och ger insikter för framtida forskning kring specifika element och frekvenser som kan förstärka dess verkan i terapeutiska och meditativa sammanhang.

Språk: Engelska
Nyckelord: meditationsmusic, mindfulness, avslappning, hjärnvågsentrainment, stressreduktion

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Tiivistelmä

Tämä tutkimus tarkastelee meditaatiomusiikin roolia rentoutumisen, stressin vähentämisen ja keskittymiskyvyn edistämisessä. Meditaatiomusiikki, jonka ominaisuuksia ovat hidas tempo, toistuvat rakenteet ja lempeät, harmoniset sävyt, tunnetaan kyvystään edistää mindfulnessia vähentämällä henkisiä häiriötekijöitä ja tukemalla läsnäolon kokemista. Tutkimuksessa keskitytään siihen, miten meditaatiomusiikki vaikuttaa aivojen oletustilaverkostoon (DMN), hermoverkkoon, joka liittyy itseään koskevaan ajatteluun ja murehtimiseen. DMN:n aktiivisuuden vähentäminen, joka on keskeinen tavoite mindfulness-harjoituksissa, korreloi stressin vähenemisen ja parantuneen keskittymiskyvyn kanssa.
Tutkimus tarkastelee myös sitä, miten tietyt musiikilliset rakenteet ja taajuudet edistävät rentoutumista aivoaaltojen tahdistuksen kautta. Tässä prosessissa aivoaallot mukautuvat ulkoisiin taajuuksiin, mikä siirtää kuuntelijat alfa- ja theta-tiloihin, jotka liittyvät rentoutumiseen, luovuuteen ja parempaan keskittymiskykyyn. Instrumentteja, kuten äänimaljoja, gongeja ja käsipaneeleja, analysoidaan niiden ainutlaatuisten akustisten ominaisuuksien vuoksi, jotka edistävät syvää rentoutumista ja henkistä selkeyttä.
Tutkimuksen käytännön osuudessa luotiin ja analysoitiin originaaleja meditaatiosävellyksiä, jotka suunniteltiin minimaalisilla ja toistuvilla rakenteilla, vakailla harmonioilla ja luonnollisilla sävyillä. Sävellyksissä käytettiin instrumentteja, kuten shruti-laatikkoa, käsipaneelia ja äänimaljoja, ja ne kehitettiin live-improvisaatiotilanteissa, jotka aloitettiin "OM"-mantralla esiintyjien yhtenäisyyden varmistamiseksi. Tutkimus vahvistaa meditaatiomusiikin terapeuttisen potentiaalin ja tarjoaa näkemyksiä tuleviin tutkimuksiin, joissa tarkastellaan tarkemmin niitä elementtejä ja taajuuksia, jotka parantavat sen tehokkuutta terapeuttisissa ja meditaatiivisissa konteksteissa.

Kieli: Englanti
Avainsanat: meditatiivinen musiikki, mindfulness, rentoutuminen, aivoaaltojen tahdistus, stressin vähentäminen

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Introduction

Meditative music, with its carefully structured sound elements, serves as an effective tool for enhancing meditation practices by facilitating relaxation, stress reduction, and focused awareness. The practice of meditation itself has well-documented health benefits, including reduced anxiety, depression, pain, and stress (Fair, B., 2023 p.114). Meditative music plays a crucial role in supporting mindfulness, a state characterized by an acute awareness of the present moment without reactive engagement with thoughts or sensations (Fair, B., 2023, p. 97).

Studies reveal that music, especially in the meditative genre, helps decrease activity in the brain's default mode network (DMN), which is associated with self-focused thinking and rumination, thereby allowing individuals to focus more effectively on the present. Meditative music achieves these effects through specific structural elements, such as slow tempos, repetitive patterns, stable harmonies, and gentle timbres, which create a calming atmosphere that synchronizes with physiological processes like heart rate and breathing, thus promoting relaxation (Berlyne, 1973; Thaut et al., 1999). This music also modulates brainwave activity, particularly within the alpha and theta frequency ranges, which are linked to states of relaxed alertness and deep relaxation, respectively (Labbé et al., 2007; Peniston & Kulkosky, 1989).

Instruments like singing bowls, gongs, and handpans are commonly used in meditative music due to their unique acoustic properties that facilitate brainwave entrainment and promote a state of calm. For instance, studies have shown that the sustained tones of singing bowls and their harmonic overtones can induce synchronization with the listener's brainwaves, leading to reduced tension, anger, and fatigue (Goldsby et al., 2017). Furthermore, meditative music can activate the parasympathetic nervous system, which helps reduce cortisol levels—a hormone associated with stress—thereby fostering a sense of calm and aiding stress recovery (Khalfa et al., 2003). Additionally, the music's predictable, gentle rhythms contribute to the reduction of amygdala activity, a brain region involved in fear and emotional responses, resulting in a calming effect that counteracts anxiety (Koelsch et al., 2006).

The aim of this study is to explore how meditative music, by providing a consistent auditory environment, can support mindfulness practices and reduce mental distractions,

thereby aiding practitioners in maintaining stable focus. This research seeks to examine how the structure of meditative music—designed to promote relaxation and concentration—not only complements meditation but also aligns with scientific evidence on its effectiveness in reducing stress and enhancing cognitive function, ultimately contributing to improved mental well-being and emotional balance.

Meditation and the Role of Music in Meditation

Practicing meditation may offer a plethora of health benefits, such as reducing anxiety, depression, pain, and stress (Fair, B., 2023, p. 114). Music, when appropriately structured, can, in turn, support mindfulness meditation. Mindfulness meditation is a general term that can include multiple styles of meditation. At a basic level, mindfulness is the ability to be fully present in the current moment. It typically involves observing one's thoughts, feelings, and sensations without reacting to them, often by concentrating on the breath or bodily sensations (Fair, B., 2023, p. 97).

Scientific research has shown that music, particularly in the meditative genre, can help decrease activity in the default mode network (DMN), a brain network associated with self-focused thinking, rumination, and distractions.

A study by Brewer, J. A., et al. (2011) found that mindfulness practices reduce DMN activity, which is also a target area impacted by music listening. This reduction in DMN activity allows individuals to focus more on the present without being distracted by thoughts or memories. Additionally, music with simple, repetitive structures and calming tones can support this focus by reducing emotional arousal and encouraging a steady, relaxed state of mind.

In a study by Alluri, V., et al. (2012), researchers observed that when participants listened to predictable, consonant music, there was reduced activation in areas of the brain linked to introspection and mind-wandering, further supporting present-moment awareness.

Structure of Meditative Music

The structure of meditative music is typically designed to create a calming and immersive experience, characterized by slow tempos, repetitive patterns, minimal harmonic changes, and gentle timbres. Scientific research suggests that these elements help reduce mental distractions and promote relaxation.

Key Structural Elements:

1. **Slow Tempo and Steady Rhythm:** Meditative music often has a slow tempo and steady rhythm, which helps synchronize with the listener's breathing and heart rate, promoting relaxation. Research by Thaut, M. H., et al. (1999) highlights how slower tempos can support relaxation and enhance focus by reducing physiological arousal.

2. **Repetition and Minimalistic Structure:** Repetition is a core aspect of meditative music, as it fosters a hypnotic, trance-like state that helps listeners stay focused on the present moment. A study by Berlyne, D. E. (1973) explains how repetitive, minimalistic structures create a state of "flow" that can sustain focus without overwhelming the listener.

3. **Gentle, Soft Timbres:** The use of soft, sustained timbres (such as synthesized pads, singing bowls, or soft percussion) minimizes abrupt sound changes and avoids activating emotional responses that could disrupt relaxation. This approach is supported by Alluri, V., et al. (2012), who found that music with gentle timbres decreases emotional arousal, allowing for a calm mental state.

4. **Stable Harmonies with Limited Modulation:** Meditative music often relies on stable, consonant harmonies with minimal modulation, as shifting keys or introducing dissonance can create tension or emotional reactions. Research by McKinney, C. H. (1997) showed that stable harmonies in music reduce stress and contribute to a meditative atmosphere.

Meditative Music and Stress Reduction

Meditative music has been shown to reduce stress and anxiety levels through several mechanisms, as confirmed by scientific research. Here are the primary ways it helps:

Reduction in Cortisol Levels

A key aspect of reducing stress is the decrease in cortisol levels in the bloodstream. When the brain senses stress, the hypothalamus releases a hormone called corticotropin-releasing hormone (CRH), which signals to the pituitary gland that the stress system needs to be activated. The pituitary gland responds by releasing the hormone adrenocorticotropic hormone (ACTH) into the bloodstream (Fair, B., 2023, p. 112). Listening to music has proven effective in mitigating the adverse effects of stress. Evidence for this can be seen in studies showing a significant reduction in salivary cortisol levels among patients experiencing presurgical stress who listened to music (Miluk-Kolasa, B., et al., 1994).

A non-medical study was also conducted on this topic (Khalfa, S., et al., 2003). In this study, the Trier Social Stress Test (TSST) was used to induce stress in 24 male university students, causing a significant rise in cortisol levels. After the test, the participants either relaxed in silence or listened to calming music. Results showed that cortisol levels dropped more quickly in those who listened to music, suggesting that relaxing music can effectively reduce stress responses by modulating the hypothalamic-pituitary-adrenal (HPA) axis. This aligns with previous research indicating that music may be more effective than silence for stress recovery. This reduction in cortisol likely occurs because relaxing music helps activate the parasympathetic nervous system, the body’s natural "rest-and-digest" system. When the parasympathetic system is engaged, the body reduces its production of cortisol, helping to return it to baseline levels more quickly.

The calming qualities of relaxing music—such as slow tempo, soothing harmonies, and predictable rhythms—signal to the brain that there is no threat.

Activation of the Parasympathetic Nervous System

The activation of the parasympathetic nervous system by slow, meditative music occurs through its calming effects on physiological processes. This system, which counterbalances the sympathetic "fight-or-flight" response, promotes relaxation, recovery, and homeostasis. When listening to slow-tempo music, the heart rate and blood pressure naturally decrease, signaling the body to shift from a state of high alert to one of rest and recovery.

A study by Thayer, J. F., et al. (2006) demonstrated that slow-tempo music prompts the release of neurotransmitters that support parasympathetic activity, such as acetylcholine, which slows the heart rate. This process helps the body recover from stress by reducing the production of stress hormones like cortisol and allowing for a restorative physiological state. As a result, the listener experiences a greater sense of calm and relaxation, directly counteracting the effects of stress.

Decreased Amygdala Activity

Meditative music reduces anxiety by modulating activity in the amygdala, a region of the brain crucial for processing fear and emotional responses. When we listen to relaxing, meditative music, it can help shift neural activity away from the amygdala, thereby diminishing the brain's "alarm system" response.

A study by Koelsch, S., et al. (2006) demonstrated that relaxing music reduces activation in the amygdala, leading to a calming effect on emotions. This effect occurs because meditative music often has slow tempos, gentle harmonies, and minimal sudden changes, which reduce arousal levels and send signals to the brain that there is no immediate threat. As amygdala activity decreases, the brain is less likely to trigger anxiety-related responses, allowing the listener to experience a state of calm and emotional regulation.

By lowering amygdala activity, meditative music helps to disengage the brain from reactive, anxious patterns, providing a pathway for reducing overall anxiety levels.

Promotes Mindfulness and Reduces Rumination

Meditative music supports mindfulness by creating an auditory environment that encourages the mind to stay focused on the present moment. This focus on the "here and now" reduces the tendency to engage in anxious thoughts or rumination, which are often the root causes of stress and anxiety. When listening to meditative music, the brain is gently guided to attend to the sounds, rhythms, and tones of the music, which discourages mind-wandering and keeps attention anchored in the present.

A study by Zeidan, F., et al. (2010) demonstrated that when mindfulness practices were paired with relaxing music, participants experienced a significant reduction in anxiety and an improvement in mood. This effect likely occurs because relaxing music provides a steady, calming backdrop that facilitates mindfulness by reducing external distractions and internal mental chatter. As the listener's attention becomes more stable and less prone to shifts toward worry or stress, levels of anxiety decrease, allowing for a more positive, relaxed mood.

In essence, meditative music supports the goals of mindfulness—focused attention, reduced reactivity, and acceptance of the present—thereby contributing to a calming effect that reduces stress.

Favourable Frequencies for Relaxation and Focus Enhancement

Meditative music with relaxing frequencies works by promoting brainwave entrainment, where the brain synchronizes its activity to external sound frequencies, shifting to slower brainwave states (such as alpha and theta) associated with relaxation and reduced stress. This process helps decrease anxiety and improve mood by encouraging the brain to enter calm, restorative states (Labbé, E., et al., 2007; Peniston & Kulkosky, 1989).

Humans exhibit five primary types of brain waves, each associated with different mental states:

1. **Gamma Waves (30+ Hz):** Linked to high-level cognitive processing, insight, and complex problem-solving.
2. **Beta Waves (14-30 Hz):** Associated with active thinking, focus, and problem-solving.
3. **Alpha Waves (8-14 Hz):** Indicate a relaxed yet alert state, common during quiet focus or light meditation.
4. **Theta Waves (4-8 Hz):** Associated with deep relaxation, creativity, and light sleep, often seen in meditation.
5. **Delta Waves (1-4 Hz):** Linked to deep, restorative sleep and healing.

Each brainwave frequency plays a distinct role in cognitive and emotional states, contributing to overall mental health and well-being (Miskovic, V., 2016).

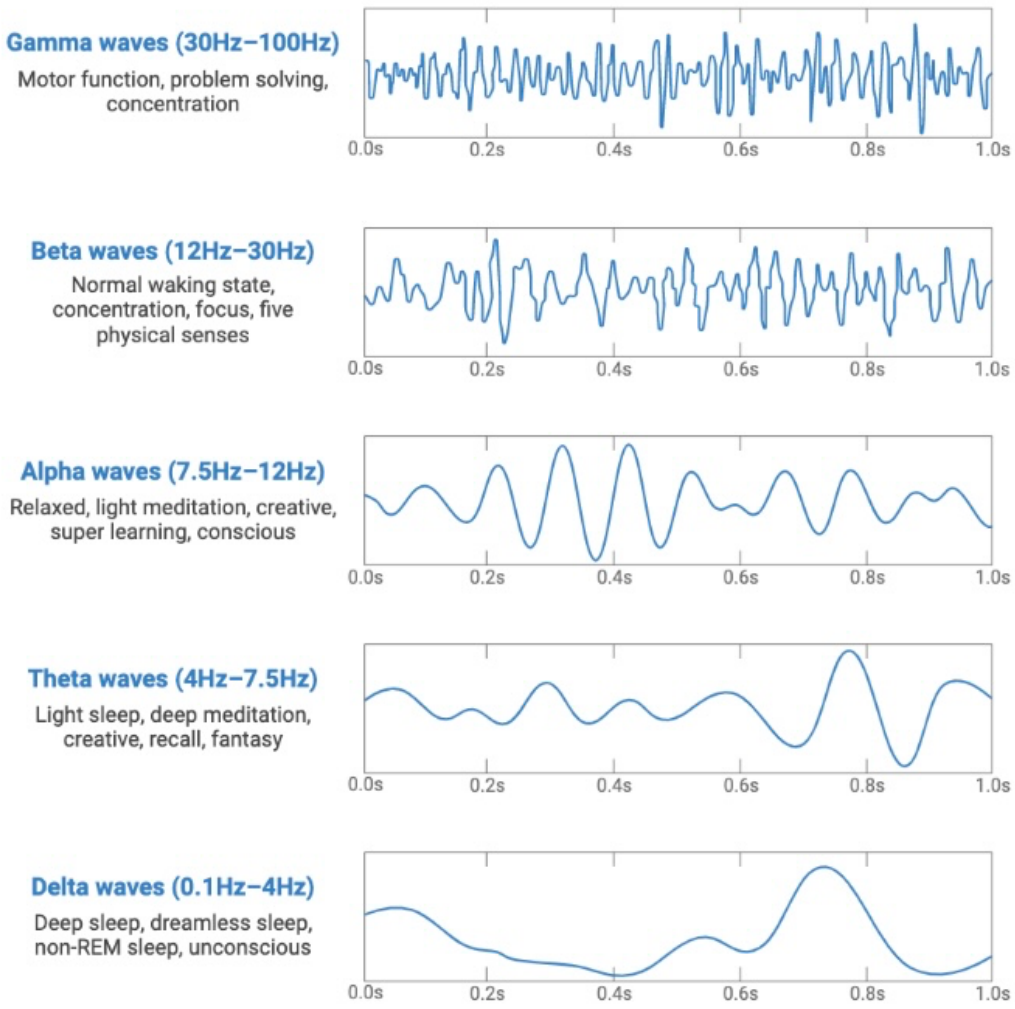

Figure 1. EEG Brain Wave Frequencies (Abhang, P. A., et al., 2016)

Sound meditation with singing bowls operates on the principle of brainwave entrainment. Singing bowls work through brainwave entrainment, where the brain's electrical activity synchronizes with the sustained tones and harmonic frequencies produced by the bowls. This effect occurs because the consistent, low-frequency sounds produced by singing bowls create a repetitive acoustic pattern that the brain can match, shifting its own rhythm to align with the external frequency.

When the brain entrains to the frequency of the singing bowls, it can move from a more active beta state (associated with normal alertness and stress) to slower brainwave states like alpha and theta. Alpha waves (8-14 Hz) are linked to a relaxed but alert state, while theta waves (4-8 Hz) correspond to deep relaxation, meditative states, and even creativity. This shift into alpha or theta waves allows the brain to enter a more restful, calm state, which has been shown to reduce stress and foster a sense of relaxation.

A study by Goldsby, T. L., et al. (2017) demonstrated the effectiveness of this process by showing that participants who engaged in sound meditation with Tibetan singing bowls reported significant reductions in tension, anger, and fatigue. These findings suggest that the alignment of brainwave patterns with the bowl's frequencies helps to calm the mind and reduce negative emotional states, contributing to overall well-being.

Research by Trivedi and Saboo (2019) found that Himalayan singing bowls could facilitate faster and deeper relaxation compared to simple supine relaxation, as evidenced by changes in heart rate variability and stress index.

Although alpha brainwaves are associated with a relaxed but alert state, they are ideal for sustained attention without anxiety. Listening to music with frequencies in the alpha range helps induce this brainwave state, supporting calm, focused mental engagement. A study by Labbé, E., et al. (2007) demonstrated that exposure to alpha-inducing music increased alpha brainwave activity, helping participants maintain a relaxed focus, which is beneficial for tasks requiring steady concentration. Additionally, research by Miskovic, V., et al. (2016) found that exposure to beta frequency auditory stimuli improved participants' ability to sustain attention on complex tasks.

Favourable sound frequencies in music can also be achieved through the use of binaural beats. Binaural beats work by playing two slightly different frequencies in each ear, which the brain perceives as a single, new frequency equal to the difference between the two original frequencies. This phenomenon, known as "brainwave entrainment," prompts the brain to synchronize its own electrical activity with this perceived frequency, leading to a mental state that matches the frequency's range.

For example, if one ear hears a frequency of 300 Hz and the other hears 310 Hz, the brain perceives a 10 Hz beat—the difference between the two. When the difference between the frequencies is within the alpha (8-14 Hz) or beta (14-30 Hz) range, it promotes brainwave activity associated with relaxed focus (alpha) or active concentration (beta).

A systematic review by Garcia-Argibay, M., et al. (2019) showed that alpha and beta binaural beats could improve cognitive functions related to focus and attention. These frequencies enhance the brain’s ability to enter states of calm alertness or active problem-solving, thereby improving task performance and concentration in participants.

Meditative Music Instruments

Meditative music employs various instruments known for their soothing tones and ability to facilitate relaxation and mindfulness. Key instruments include:

Handpan

The handpan, a relatively new musical instrument, has rapidly gained popularity due to its unique sound and playability. The handpan is a type of hand-played metallic percussion instrument that shares similarities in shape and sound with the Hang, which was originally developed by PANArt Ltd. in January 2000 in Switzerland. It comprises two connected hemispherical steel shells that produce notes through gentle and quick finger strikes. Like the steel pan, the frequencies generated by the handpan adhere to the 1:2:3 ratio in its principal vibration modes for each note. An additional frequency around 85 Hz in the Hang's sound is linked to the cavity resonance frequency.

Here are some technical characteristics of the handpan:

- **Shape and Construction:** The handpan is typically a round, convex steel drum with a central note and several surrounding notes arranged in a circular pattern. It is usually made from two half-shells of deep-drawn, nitride steel sheet that are glued together at the rim. The top shell, known as the "dome," is divided into a series of concave depressions, or "notes," arranged in a circular pattern. The size and depth of these notes determine their pitch. The bottom shell, known as the "resonator," features a large hole to allow sound to escape (Alon E. & Murphy D. T., 2015).

Figure 1. View of a Handpan from Top, Side, and Bottom

- **Notes:** A standard handpan typically consists of a central note known as the “Ding,” which serves as the fundamental pitch, surrounded by several tone fields or notes arranged in a scale. A standard handpan usually has around 8 to 12 notes. The specific arrangement of notes can vary depending on the maker and the desired musical scale, but generally, handpans are tuned to be harmonious and versatile for playing a wide range of musical styles.

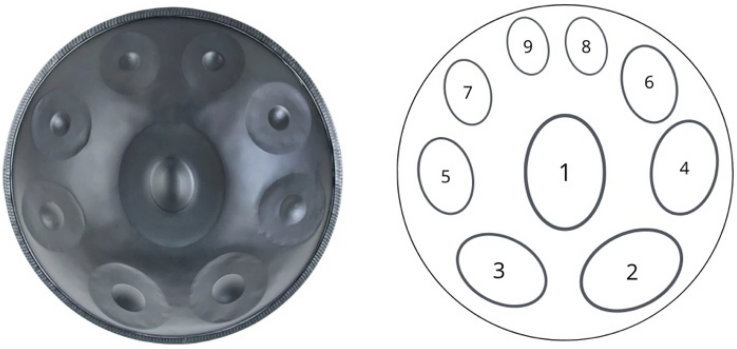

Figure 2. Top View of a Handpan with Nine Note-Fields

- **Tuning:** Handpans are usually tuned to a specific scale or mode, such as major, minor, or pentatonic scales. The tuning is done by carefully hammering and shaping the notes to produce the desired pitch and sound quality. The most common frequency for the central note of a handpan is around 220 Hz, which is approximately an A3 note. The tone fields surrounding the central note are strategically tuned to create harmonious overtones and a rich, resonant sound.

  The practice of using sound to promote healing and relaxation is rooted in ancient traditions. The handpan's gentle, resonant tones are believed to have a calming and balancing effect on the body and mind. The vibrations produced by the handpan are thought to interact with the body's energy fields, promoting relaxation, stress reduction, and emotional balance.

The Impact of the Handpan on the Listener's State

There is a limited amount of research on the impact of the handpan on listeners, as the instrument is relatively new. However, it can be asserted that handpan music has a positive effect on listeners due to the specific nature of its tuning.

In Western music theory, the octave (2:1 ratio) and perfect fifth (3:2 ratio) are fundamental intervals that are perceived as consonant and stable. The handpan's design incorporates these intervals, creating a sound that resonates with our natural sense of harmony. This harmonic structure contributes to the instrument's calming and meditative qualities, making it effective in sound therapy and relaxation practices (Malzer, 2019).

Research from N. I. Lobachevsky State University (Kazantsev, V. B., et al., 2019) suggests that harmonious sounds, like those from a handpan, lead to synchronized neural firing, creating rhythmic, organized brain signals. This regular neural pattern, unlike the erratic signals triggered by dissonant sounds, may facilitate a calming effect. The article also highlights that the handpan's sustained notes and gentle, flowing rhythms can enhance mindfulness and support a meditative state, making it an effective tool for stress relief and emotional balance.

Singing Bowls

Singing bowls are a type of musical instrument historically utilized in practices of meditation, relaxation, and therapeutic intervention. When struck or circled with a mallet, these bowls emit rich, resonant tones accompanied by harmonic overtones. The acoustic vibrations and sounds produced by singing bowls are believed to facilitate mental clarity, alleviate stress, and contribute to an enhanced state of well-being. Singing bowls have their roots in the Himalayan regions, particularly in countries like Nepal, India, and Tibet. They have been an integral part of Buddhist and Hindu spiritual practices for centuries.

Types of Singing Bowls

1. **Traditional Tibetan Singing Bowls**

    - **Material:** Typically made from a combination of seven metals—copper, tin, zinc, iron, silver, gold, and mercury—each representing a celestial body.
    - **Craftsmanship:** Handcrafted by skilled artisans using ancient techniques passed down through generations.
    - **Sound:** Known for their deep, earthy tones and complex overtones, ideal for deep meditation and sound healing.

Figure 3. Traditional Tibetan Singing Bowls

2. **Nepalese Singing Bowls**

    - **Material:** Often made from similar metal alloys as Tibetan bowls but may incorporate additional elements based on regional craftsmanship.
    - **Design:** May feature intricate engravings and unique shapes specific to Nepalese culture.
    - **Sound:** Produces a slightly different tonal quality, often described as brighter compared to Tibetan bowls.

Figure 4. View of Nepalese Singing Bowl from the Side

3. **Crystal Singing Bowls**

    - **Material:** Made entirely from quartz crystal.
    - **Sound:** Emits pure, high-frequency tones with clear, bell-like overtones.

Figure 5. View of Crystal Singing Bowls from the Side

4. **Modern/Contemporary Singing Bowls**

- **Material:** May incorporate non-traditional materials like glass or composite metals.
- **Design:** Features innovative shapes and sizes to suit contemporary aesthetic preferences.
- **Sound:** Offers a diverse range of tones to cater to modern therapeutic and musical applications.

Figure 6. Modern Metal Singing Bowls

The Impact of Singing Bowls on the Listener's State:

According to a study by Kim, Seong-Chan (Kim, S. C., & Choi, M. J., 2003), the sound of singing bowls at a frequency of 6.68 Hz positively influences the brain activity of listeners, particularly in the theta wave range (4–8 Hz), which is associated with states of relaxation and meditation.

Listening to the singing bowl sound led to the synchronization of brain waves with the bowl's rhythmic frequency, significantly amplifying their intensity. Brain wave activity at the beat frequency increased by 251.98% from the baseline level, confirming the sound's effectiveness in inducing a meditative state.

Changes in Different Frequency Bands:

- Delta Waves (0–4 Hz) increased to 135.18% of their initial level.
- Theta Waves (4–8 Hz) increased by 117.07%.
- Higher frequency waves, such as alpha (8–13 Hz), beta (13–30 Hz), and gamma (30–50 Hz), decreased (e.g., alpha down to 85.28%).

Some changes in brain waves persisted even after the sound exposure, indicating a deep relaxation effect maintained by the singing bowl sound.

Thus, the sound of singing bowls can be effectively used to induce states of relaxation and meditation by activating low-frequency brain waves.

Gong

Gongs, as ancient musical instruments, hold significant cultural and spiritual value and are widely utilized in diverse contexts, including music, meditation, and sound therapy. Historical evidence indicates that their origins trace back to early civilizations, particularly in Southeast Asia, with usage documented as early as the Bronze Age (3000–2000 BCE). They have remained integral to various traditional Asian musical forms, most notably in Indonesia, where they serve a foundational role in gamelan ensembles. The following provides an overview of gong types, methods of construction, and their impact on auditory and therapeutic experiences.

Construction and Materials

Gongs are typically crafted from a combination of metals, predominantly copper and tin. Higher-quality gongs are often characterized by a greater copper content, which can enhance the richness of their tonal quality. In addition to copper and tin, certain gongs may incorporate other metals, such as zinc or nickel, to modify sound characteristics or structural resilience. The construction process is notably labor-intensive, as artisans usually hand-hammer and meticulously tune each gong to achieve specific acoustic qualities.

The acoustic properties of a gong are significantly influenced by its metal composition, thickness, and shape. For instance, thicker gongs tend to produce deeper, more sustained tones, whereas thinner gongs yield a brighter, more immediate sound. Similarly, the size of the gong plays a crucial role in determining pitch and resonance. Larger gongs are capable of producing low, resonant vibrations that are conducive to meditative states, while smaller gongs generally emit higher-pitched, sharper sounds. This variation in size and structure enables gongs to fulfill diverse functions in both musical and therapeutic contexts.

Types of Gongs

1. **Suspended or Hanging Gongs:** These are the most common type, typically hung on a stand. They can vary greatly in size, from small hand-held instruments to large, room-filling gongs. Examples include the Chinese Chau Gong, which produces a low, resonant tone, and the Thai Gong or Nipple Gong, which has a raised center and a more focused pitch.

2. Bowl or Bossed Gongs: These gongs have a raised boss, or "nipple," in the center, which gives them a unique tone and sustaining power.

Common in Southeast Asia, these gongs are often used in rituals and celebrations, such as the Javanese gong found in gamelan music.

a)  b) 

Figure 7. a) Hanging Chinese Chau Gong; b) View of Bossed Gong from front, side and bottom

3. Planet Gongs: Developed in modern times by companies like Paiste, these gongs are tuned to specific frequencies related to celestial bodies, based on a concept called the "Cosmic Octave."

Each Planet Gong is tuned to a frequency associated with a specific celestial body. For example, the Earth Gong is often tuned to around 136.10 Hz, corresponding to the frequency of one Earth year.

Other common Planet Gongs include those for the Moon, the Sun, and planets such as Mars and Venus, each with unique vibrational characteristics based on their orbital frequencies.

4. Tam-Tams: A type of flat, rimless gong that doesn’t have a defined pitch, also known as a flat gong.

Widely used in Western music for dramatic effects, it produces a deep, rolling resonance when struck, making it ideal for creating atmosphere in symphonic compositions.

a)  b) 

Figure 8. a) Paiste Planet Gong; b) Tam-Tam Gong

The Impact of Gongs on the Listener's State

The study by Albinca Pesek (Pesek, A., & Bratina, T., 2016) demonstrates that gong vibrations provide significant relaxing and therapeutic effects. Among 129 participants, 77.5% viewed gong sound baths as both healing and relaxing, with most reporting inner peace, improved physical and mental well-being, and increased motivation. Many observed reductions in stress-related symptoms such as headaches and back pain. Notably, 27.4% could fully immerse themselves in the sound, 23% felt strong vibrations, and 15.1% experienced altered states of consciousness. Some participants (12.3%) felt mild pain in areas with previous injuries, while smaller percentages faced emotions like a rush of thoughts (9%) or mild fear (4.1%). Participants rated overall improvement in psychophysical condition at 3.96 on a 5-point scale. This research suggests that gong sound baths harmonize the body's vibrations, helping to alleviate stress, enhance mental clarity, and support emotional stability.

Shruti Box

The shruti box is a traditional Indian instrument known for its ability to produce a continuous harmonic drone. Structurally similar to a harmonium but lacking a keyboard, the shruti box is primarily employed to create a stable auditory foundation in musical and meditative contexts.

Figure 9. Shruti Box in open view

Construction and Materials:

The shruti box is a compact, portable reed instrument with bellows. Unlike the harmonium, it does not contain keys; instead, it utilizes a series of levers or knobs to activate specific reeds, which in turn produce the desired pitches. Sound is generated through manual operation of the bellows, which forces air through selected reeds, yielding a continuous drone sound often used as harmonic support.

Tuning:

Typically, shruti boxes can be tuned to various scales, enabling adaptability across different musical traditions. It is commonly tuned in alignment with pitches used in Indian classical music. The instrument allows for the selection of one or more pitches to create a layered, resonant drone, which serves as a harmonic anchor in both vocal and instrumental performances.

The Impact of the Shruti Box on the Listener's State

Although there is limited research directly on the shruti box, similar studies on continuous sound patterns provide insights into its potential effects. The consistent drone produced by the shruti box can facilitate meditative states. This statement pertains to broader research within the fields of sound therapy and auditory neuroscience, particularly studies that investigate the capacity of consistent, repetitive auditory stimuli—such as drones or continuous tones—to facilitate relaxation and alleviate stress.

Noise Percussion

Noise percussion plays a significant role in meditative, relaxing music by generating complex auditory textures that disrupt established cognitive patterns. This disruption enables participants to engage in non-linear thinking and facilitates emotional release. In sound healing practices, the unpredictable nature of noise percussion sounds redirects the listener's focus, fostering relaxation and emotional catharsis through unique sensory engagement. By incorporating sounds that resemble natural elements—such as rain, ocean waves, and thunder—noise percussion evokes imagery linked to the natural world, grounding the listener and enhancing a sense of connection to the environment.

Various types of noise percussion instruments include shakers, rattles, rainsticks, ocean drums, thunder drums, scrapers, and guiros. Frame drums, hand drums, and even snare drums can also be played in unconventional ways, such as by dragging a brush or hand across the drumhead to produce non-rhythmic textures.

Figure 11. 1. Nut Shells Maracas 2. Caxixi Shakers 3. Rain stick 4. Thunder Drum 5. Ocean Drum 6. Hand Drum 7. Guiro Music Scraper 8. Shaman Drum

Voice

The sound of the human voice, particularly through singing, has a profound impact on the listener's well-being, influenced by biological, psychological, and social mechanisms. According to a review by Gick, M. L. (2011), singing engages breathing techniques and stimulates the parasympathetic nervous system, which promotes relaxation and reduces stress hormone levels, such as cortisol.

This reduction in stress responses is particularly notable in settings where participants engage actively, whether in groups or individually. Studies show that the voice can evoke responses associated with improved emotional states, where singing together or hearing someone sing induces positive emotions, enhances social bonding, and creates a shared emotional experience (Gick,M. L., 2011).

This collective engagement in sound production or listening fosters a sense of community and reduces feelings of isolation, which is crucial for mental well-being. Furthermore, singing and listening to the human voice can influence immune function. Research demonstrates increases in Secretory Immunoglobulin A (SIgA) after singing activities, which is a marker of enhanced immune response, suggesting that singing or vocal engagement may bolster the body's defenses in response to social and emotional stimulation (Gick, M. l., 2011).

In summary, the voice as a therapeutic sound modality works on multiple levels to influence well-being: physiologically by managing stress response and immune function, psychologically by uplifting mood and emotional states, and socially by enhancing feelings of belonging and reducing isolation. This multidimensional impact of vocal sounds, especially singing, highlights the unique role of the voice in contributing to overall health and well-being.

These instruments are integral to meditative music due to their unique acoustic properties, which facilitate relaxation, reduce stress, and enhance mindfulness. Therefore, the majority of these instruments were utilized in the practical component of this study.

Interview with practitioner Andrii Chutchenko

Andrii Chutchenko is a Ukrainian musician with a medical background, specializing in sound therapy and meditative music. He has over twenty years of experience in sound practice, having studied under renowned masters in Nepal and acquired knowledge and experience from masters in the Northern Indian Himalayas. Today, Andrii actively tours across Ukraine, conducting sound practices and concert-meditations for anyone interested, including in conflict zones for local residents and Ukrainian soldiers. He also shares his knowledge by teaching the interaction with singing bowls and other meditative instruments.

- Can you be called a sound healer or would it be more correct to say a sound practitioner? (00:04)

Andrii Chutchenko: "Yes, probably a sound practitioner, because with a sound healer - this is my subjective opinion - a person who can truly heal with sound has the right to be called that. I was involved in therapy at one time, well, now I'm essentially involved, because I have an official medical education, and sound healing, yes, it's like healing with sound. Well, do I heal with sound? I don't know. I relax people, at times yes. I shift consciousness into some more subtle spaces. Yes, whether therapeutic moments happen there, only a person who gave feedback can say."

- Could you tell us about your path, how you came to sound practices? (00:49)

Andrii Chutchenko: "At age 11 I started listening to rock music. Four years later, my friend and I formed a rock band, and my role in this group was playing bass guitar, but in reality, it was a rhythm guitar that covered both the rhythm section and bass section. It was quite harsh music, and after about five years I got bored. At that point, it seemed to me that development had stopped, musically speaking, and I decided to leave the group, and around that time I met an archimandrite, an elder who was in charge. I'm not sure if he's still alive, in Belarus, in a town in Mogilev region, called Khotimsk. He introduced me to bells, and after the war, this elder collected bells for his tower, to revive, let's say, the art

of bell ringing. Thanks to his keen sense, he had a great collection of bells, all harmonizing well together, and I liked it so much at that moment that an idea started forming in my head that it would be great to have a similar bell tower nearby, but portable, because when bells weigh one and a half to two tons, it's clear that you can't just put them in your pocket, you need to hang them somewhere to play them. So after some time, probably a little less than five years, while browsing in a bookstore at Petrovka market, I hear a distant bell ringing. I realize the nearest churches are out of earshot. I start walking towards the sound of this bell. I approach a stall where a seller is advising a potential buyer. On the counter are two singing bowls, as I later learned. It was my first time seeing one. I didn't know such things existed. I was completely shocked that this small object could fully replicate a massive bell's sound. Of course, if someone stands under a huge bell, the vibrations are intense. It could practically break a person down to atoms. But this tiny bowl captures that exact feeling. In fact, in the East, they're called Tibetan bells. So if you think about it, it's essentially the same as a bell, just without the clapper."

- Do all singing bowls have a positive effect on the listener? (04:08)

Andrii Chutchenko: "In Eastern therapy, forged bowls are used. There's a reason for this: They have a wide range of overtones. If there's an organ issue and the therapist tries to interact and treat it, it's unlikely that... the bowl's sound or vibration will resonate with the affected organ and make it worse. With cast bowls, that's possible. They're tuned to one sound, typically with few overtones, or none at all, depending on the material and size of the bowl. There's a higher chance that it might resonate with the affected organ. But for me, it's a deeper tool."

- You used many instruments in your practice, but which one do you consider the most effective for relaxation and calming? (05:17)

Andrii Chutchenko: "A deeper instrument for me is the singing bowl, a high-quality one at that. A singing bowl, modern perhaps, but crafted with great attention by the smith. The most valuable thing in this universe: the metals and their ratio. It's crucial because each metal gives a specific overtone coloring. I've worked more with these than flat bells or

hangs and gongs. For calming, I believe the bowl is the best tool, considered the top instrument in some Western European psychiatric clinics. The bowl's deemed the best non-drug tool to calm agitated patients too. Military psychologists told me that in some NATO units - European, British, Czech, German - during soldiers' mental recovery, they use sound therapy with bowls, bells, or maybe singing rods."

"That is, regular physics is process physics. High sounds excite or tone our central nervous system, while low sounds relax it. So even with one bowl, just one bowl, you can produce different sounds. In this case, if you close your eyes and focus your attention on this study, it will be relaxing. It's clear that sound directly affects your physical body and fully penetrates it. But if you want to stimulate your central nervous system, and you're about to do some physical work or activity, you can use this same high-quality bowl to create this effect. You... can play with these effects. When interacting with the bowl, you can produce various sounds or filter out certain vibrations, so you're guiding the process."

- Are there any contraindications to sound practice? (08:18)

Andrii Chutchenko: "Well, physiological contraindications like epilepsy and pacemakers can affect you. Any metal in the body can interact if there's contact."

- Does your medical knowledge help you in your practice? (08:37)

Andrii Chutchenko: "Knowing your body's physiology never hurts, like where certain organs are and what they do. It's good to know roughly where things are. You can try relaxing different segments in your abdomen or the paraspinal muscles along your spine that support our 'antenna'. The main thing is our biocomputer - how it perceives and interprets all this. We're getting into that now. The key, in my view, is proper handling of these tools, especially the resonant ones. I've observed that not all so-called sound healers correctly extract sounds from their instruments. But our brain reacts very strongly to this."

- But the sound can also cause anxiety, right? (10:00)

Andrii Chutchenko: "Well, look, from what I understand, at least every other person (in Ukraine) isn't sleeping well at night. It's become a sort of normal routine for people, you could say, with constant explosions, rocket launches and such. The sound is what affects them, its intensity, its specific vibrational characteristics. It's like those gongs, right? Those intimidating instruments when first encountered, invented by the Chinese."

- I know that you played for the soldiers in the frontline zone, did the sound practice help reduce their stress? (10:41)

Andrii Chutchenko: "Yes, definitely, anxiety came out. We once held a concert in the border area, and there were guys at the training ground who were undergoing rotation. They had already been in combat zones and were brought to this rural club for the concert. There were about 200 seats, and among the villagers were these soldiers. Military psychologists were with us and they specifically interviewed all the soldiers after the concert. Everyone had to say at least a couple of words about whether this was necessary or not, and what happened to them. Many said that over the past six months, it was the best thing they had ever experienced in their environment."

- In your experience, what instrument did people in a difficult psychological state perceive best? (11:22)

Andrii Chutchenko: "Many had PTSD with severe trauma, so From our initial toolkit, I realized that with the hang drum there were no complaints, not even with bowls. At first, there were complaints about the bells. Then at some point, the bowls started too. People were just leaving the hall, but thankfully, they reacted well to the hang drum. Positively."

Practical Part

Preparation Process of Live Improvisation Recording

Although this is improvisational music, and much depends on the performers' mood and state during the recording, we held preliminary rehearsals beforehand (Folder 2, file 2). In these sessions, we established the selection of instruments to be used, the intended emotional tone, and a rough sequence for introducing or switching instruments. Additionally, to ensure ensemble cohesion, we arranged several live performances where we repeatedly immersed ourselves in improvisational music-making in a jam session format with other people (Folder 2, file 1; file 6). A home recording of one rehearsal (Folder 2, file 3) was also made, allowing us to analyze and recognize, for example, that in the beginning of the composition “Far Night Forest,” it would be most effective to include only the singing bowls, percussion, and a light keyboard texture, with the voice introduced later. This adjustment contributed to a smoother immersion into the atmosphere of the composition.

To achieve deeper immersion and a better understanding of the effects of sound-healing instruments, I attended several masterclasses on intuitive playing techniques for the handpan and tongue drum, noise percussion, as well as training on the proper handling and activation of the sound of singing bowls (Folder 2, file 4; file 5). This enabled me to incorporate not only my vocal abilities but also other instruments in the music creation process, which, in turn, significantly expanded the textural depth of the sound.

To deepen our understanding of the listener’s experience, we collaborated with sound healing master Yan in conducting three consecutive sound performances. During these sessions, I played the handpan, tongue drum, and other sound healing instruments. Feedback was then gathered from the listeners regarding which elements and techniques most effectively immersed them. This feedback subsequently allowed us to develop the structure of the compositions (Folder 2, file 7; file 8)

Recording Process

Three individuals were involved in the development of this creative project: Olga Bogatyrenko, as the project organizer and vocalist, Taras Fenyk, as the pianist, and Alexandr Dostovalov, as a multi-instrumentalist and sound practitioner. All participants are equal co-authors of the musical material.

Since the objective was to record a live version, all participants were situated in the same recording room, performing simultaneously. The sound engineer was also present in the recording room, rather than in the control room, to promptly make technical adjustments if needed without halting the recording process. This was a single recording session lasting one and a half hours of uninterrupted playing. It was essential for the music to emerge organically in a continuous flow, allowing us to deepen our relaxation and meditative state as the session progressed. Upon reviewing the recording, several distinct compositions were identified as natural segments within the continuous performance (Folder 3. File: 1; file 2; Pic. 1; 2; 3).

The session was recorded using four microphones: two AKG 414 XLS condenser microphones in omni mode, spaced 17 cm apart, capturing the overall room sound at the center of the recording space; a Neumann U87Ai condenser microphone, also in omni mode, specifically capturing the flute; and an Electro-Voice RE-20 dynamic microphone directed at the vocal. The Nord synthesizer was connected directly to the Antelope Zen Studio+ audio interface.

We began all our recording sessions with a soundcheck followed by the performance of the "OM" mantra. This practice allowed the performers to align with each other, feel the ensemble's cohesion, relax, and enter a meditative state. For the sound engineer, it provided an opportunity to make final adjustments to all settings, ensuring optimal sound quality for the recording. (Folder 3. File 2)

Music Analysis

Genre of the project: Meditative, ethno-ambient, relaxation music

Purpose:

The purpose of meditative or relaxing music is to foster a state of calm, mindfulness, and inner peace, helping listeners to reduce stress, enhance concentration, and achieve relaxation.

Music Analysis of Song - "OM"

Instruments:

Keyboard, forest flute, metallophone, voice

Participants: Aleksandr Dostovalov – forest flute, metallophone, voice; Taras Fenyck – keyboard, voice; Olga Bogatyrenko – vocal, shruti box

Form:

This composition is an interpretation of the OM mantra, with its primary goal being to remain smooth and atmospheric, immersing the listener in a meditative practice through its monotone sound and continuous repetitions of "OM." Consequently, there are no structural divisions, as the intent of the meditation is to create a sense of endless flow and boundless space, without form or boundaries.

Timbre and Instrumentation:

Shruti Box

The foundation and monotony of the sound are created by the shruti box, which, due to its structure, provides a continuous tone and a gentle, rocking effect.

Keyboard

The keyboard sounds very transparent and subtly complements the composition with intervallic accents or short melodic motifs.

Forest Flute

The forest flute also sounds very spacious, inserting phrases and motifs throughout the composition, adding a natural, atmospheric quality.

Music Analysis of Song "Far Night Forest"

Instruments:

Singing bowls, keyboard, forest flute, noise percussion, metallophone, handpan, voice.

Participants:

- Aleksandr Dostovalov – singing bowls, handpan, forest flute
- Taras Fenyck – keyboard
- Olga Bogatyrenko – vocal, noise percussion

Timing:

14:06 minutes

A long composition time was chosen because meditative music should have extended playtime to support prolonged focus and deep relaxation. Meditation and relaxation require time for the mind and body to transition from active, alert states to calm, restful states. Longer tracks allow the listener to gradually ease into this shift without interruption, promoting a sustained meditative state that is free from abrupt changes in sound.

Form:

This composition lacks a clear beginning, middle, or end, creating a "timeless" quality that helps listeners disengage from a sense of structured time. This can enhance the meditative effect, as listeners feel less compelled to think about time passing, allowing for a more immersive experience. However, I roughly outline the parts based on the timing in minutes. The composition can be divided conditionally into the following parts:

- **Intro: (0 - 7:30)**

  This part features singing bowls, metallophone, keyboard, noise percussion, and the forest flute as the main melodic instrument.

- **Middle Part: (7:30 - 12:47)**

Starting at the 7:30 mark, audible breathing becomes discernible, followed shortly by the introduction of vocal elements, and the handpan also starts to sound like additional percussion.

- **Outro: (12:47 - 14:06)** Starting from 12:47 minutes, the forest flute sounds again, as in the first part, which can be considered the end of the cycle of the composition.

Tonality: D minor

The D minor key was selected to align with the tuning of the forest flute and handpan, both of which are set in this key, thereby ensuring tonal coherence within the composition.

Timbre and Instrumentation:

Singing Bowls

At the beginning of the composition, the singing bowls sound with a transparent texture and without a specific rhythmic pattern or melody, aiming to create a sense of spaciousness and a feeling of continuous resonance. To enhance this effect, a sustained background tone on the keyboard is introduced from the first seconds, providing a continuous sonic foundation throughout.

Flute and Percussion

This composition was conceived as spatial, aiming to create a sense of the listener's presence in a forest, where the sound of a stream (represented by noise percussion from 2:50 to 3:27) and birdsong-like elements can be heard. The forest flute was specifically chosen for this piece, as its material and shape lend it an especially authentic sound (starting from 2:25). This instrument imparts a natural, organic quality to the composition, harmonizing with the surrounding soundscape’s natural atmosphere.

Keyboard

The keyboard plays a crucial role here, providing a soft, sustained foundation with its rich, flowing harmonies. Additionally, it introduces melodic fill-ins that serve both as solo melodies in certain moments, which sound crystal clear on high notes and can be compared

to dew drops (e.g., at 4:44, 4:57), and as harmonic support, filling in the empty spaces within the composition.

Voice

The breathing sound at the 8:03, 8:15, 8:25, and 8:37 marks has a deeply emotive quality, gently preparing the listener for the forthcoming vocal entry. This subtle transition allows the listener to relax and avoids any sense of abruptness, which is essential for maintaining a state of calm and tranquility throughout the listening experience.

The vocal timbre initially features a breathy quality on the fundamental tone of D at 9:11, bearing a tonal similarity to the sound of the forest flute. From 9:11 to 11:00, the voice and flute seem to engage in a dialogue, with a call-and-response pattern, after which the voice fully assumes the role of the solo part. The vocal line is rendered softly and smoothly, primarily with sustained, flowing tones that shift in dynamics from soft to loud, creating a sense of approaching and receding, enhancing the spatial and immersive quality of the composition.

Handpan

In the middle of the composition (11:29 – 14:06), the handpan enters as additional percussion, but without a strong rhythmic pattern, with its timbre and sound kept subtle and restrained. Its tone is softly colored with minimal overtones, allowing it to blend seamlessly without overpowering the other elements in the arrangement.

Music Analysis of Song "Falling Within"

Instruments:

Shruti Box, keyboard, forest flute, noise percussion, metallophone, handpan, voice.

Participants: Aleksandr Dostovalov – handpan; Taras Fenyk – keyboard; Olga Bogatyrenko – vocal, noise percussion, shruti box

Timing:

13:00 minutes

Tonality: D minor

The key of D minor was chosen to match the tuning of the handpan.

Form:

- **Intro: (0 - 2:35)**

  The composition begins with the sounds of a shruti box, handpan, and keyboard, accompanied by noise percussion and a metallophone.

- **Middle Part 1: (2:35 - 6:50)**

  In this section, the handpan begins to play a repetitive, clear melody with a rhythm, and then vocals are introduced. The handpan presents a more defined melodic pattern.

- **Middle Part 2: (6:50 - 9:30)**

  Around the 7th minute, all sounds gradually fade, marking the beginning of a new cycle of dynamic development.

- **Final Part: (9:30 - 13:00)**

Timbre and Instrumentation

Shruti Box

The composition begins with the sound of the shruti box, which creates an endless, droning background that imparts a sense of smoothness and monotony to the piece. Due

to its unique mechanism of bellows operation, the shruti box introduces a subtle dynamic pulse that, much like breathing or the ebb and flow of waves, builds and recedes. These tonal characteristics provide a gentle foundation for the entire composition, creating a soft, immersive soundscape.

Handpan

At the beginning, the handpan sounds quite abstract, filling the space with tones that do not form a specific or predictable melody. Starting at 2:45, however, the handpan becomes the primary accompaniment, introducing a clear rhythm and melody that establishes a stable texture.

Voice

The vocals in this composition are sung primarily on the syllable "I," occasionally shifting to the vowel "O," which creates a call-and-response effect, as heard at 4:30, 5:17, and 8:53. Notably, each vocal phrase unfolds smoothly, with dynamic shifts from soft to loud, creating a sense of approach and distance. Additionally, a yodeling technique is used, adding an authentic, ethnic quality that resonates with natural sounds. The melody is constructed using grace notes and surrounding tones based on a pentatonic scale, which further adds to the composition's authentic sound.

Keyboard

In this composition, the keyboard serves as a framing element. Starting at 1:01, individual notes from the keyboard are introduced as a sound design feature to enhance the atmospheric quality. This creates a sense of call-and-response with the handpan in the introductory section of the piece (from 1:01 to 2:45). Subsequently, the keyboard takes on a more textured role while maintaining a sense of monotony, with the left hand playing a repeating tonic note in D. Meanwhile, the higher notes are filled with a textured melody that complements the primary accompaniment of the handpan.

Music Analysis of Song "One Step Higher"

Instruments:

Keyboard, forest flute, noise percussion, metallophone, voice, singing bowls

Participants: Aleksandr Dostovalov – forest flute, singing bowls; Taras Fenyk – keyboard; Olga Bogatyrenko – vocal, noise percussion, metallophone

Timing:

9:27 minutes

Tonality: D minor

The key of D minor was chosen to match the tuning of the forest flute.

Form:

This composition features a very transparent, spatial sound and a minimal number of instruments, allowing it to be structurally divided into two distinct sections.

- **Part 1: (0 - 4:51)**

  In this section, the forest flute takes the lead as the solo instrument, supported by the keyboard, which fills the space, along with noise percussion and a metallophone.

- **Part 2: (4:51 - 9:27)**

  This section begins with the introduction of vocals. In this composition, the voice interacts with the flute's solo role, complementing rather than fully overtaking it, thereby enhancing the primary sound of the flute.

Timbre and Instrumentation:

Forest Flute

The forest flute introduces a gentle phrase at the very beginning of the composition, subtly establishing its presence and setting the atmosphere. In the first part of the piece, the flute plays sparse, distinct motifs, resembling echoes of nature. Starting at 4:51, it assumes a solo role, engaging in a call-and-response with the vocals.

Keyboard

At the beginning of the composition, the keyboard plays sparse, high notes resembling chimes. Starting at 1:08, it picks up the droning sound of the bowl in the lower range, establishing a stable, sustained background in the low tessitura while harmonically filling the space with mid- and high-range notes. Additionally, at 2:50, a buzzing effect is introduced, adding depth to the sustained bass notes.

Voice

The vocals make their entry at 3:44 in the form of calm breathing, continuing until 4:30, which encourages the listener to breathe slowly as well, fostering a sense of tranquility. At 4:51, the voice begins to sound with smooth, steady tones, incorporating a yodeling technique that closely resembles and harmonizes with the flute. The vocal line concludes at 8:13 with a gentle exhale, leaving space for the flute to take the lead.

Noise Percussion and Metallophone

At 0:18, a distinctive sound is heard that resembles the creaking of tree branches. This sound is actually the creak of the chair the sound engineer was sitting on. It was intentionally retained in the composition, as it closely aligns with natural sounds, enhancing the immersive atmosphere. This creaking sound reappears at 5:50, further contributing to the sense of being surrounded by nature.

At the 0:30 mark, the sound of Nut Shells Maracas can be heard. This sound adds a natural texture to the composition, evoking associations with the rustling of leaves or gentle movements in nature, enhancing the immersive, organic atmosphere.

From the 1:40 to 2:29 mark, the sound of water and bowls can be heard, further deepening the sense of being immersed in nature. This combination of sounds enhances the listener's experience, creating an atmosphere that evokes the tranquility and presence of a natural setting.

At the 3:12–3:25 mark, the sound of a metallophone is heard as an additional textural element, contributing a sustained, droning quality but at higher pitches. This layering adds depth and contrast to the composition, enriching the soundscape with varied tonal textures.

Music Analysis of Song - “Cradle of Mother Earth”

Instruments:

Keyboard, noise percussion, metallophone, handpan, voice

Participants:

- Aleksandr Dostovalov – handpan
- Taras Fenyk – keyboard
- Olga Bogatyrenko – vocal, noise percussion, metallophone

Timing:

10:18 minutes

Tonality: D minor

The key of D minor was chosen to match the tuning of the handpan.

Form:

- **Intro:** Lasts from the beginning to 1:48. Here, all attention is centered on the voice, as if beginning a story. In the background, the handpan plays without a defined melody or rhythm, more as a form of percussion, leaving ample space for the voice to resonate. This section concludes with an exhale into silence.
- **Part 1:** From 1:48 to 7:17. This section begins distinctly with the sound of the metallophone, and the handpan starts playing a clear melodic and rhythmic pattern.
- **Part 2:** From 7:17 to 9:30. In this section, the handpan shifts to a more intense rhythm, and the overall dynamics of the composition become stronger.
- **Outro:** From 9:30 to 10:18. Everything becomes quieter, and the handpan melody returns to the theme introduced in the first section.

Timbre and Instrumentation

Voice

In the introductory section (0:00–1:41), the voice sounds soft and varies across different syllables, as if it were a calming narration with gentle breaths and pauses, allowing for a "listening" and then a "response." From 6:01, a motif begins to emerge, which recurs later in the second section from 7:35 to 8:04 and again at 8:32.

Handpan

In the first section, the handpan plays isolated motifs and notes, functioning more as percussion to add texture to the pure sound of the voice. Starting at 1:50, the handpan establishes a clear rhythm and melody, which serves both as a lead and as accompaniment to the voice from 4:34 onward. The dynamics of the handpan are in harmony with the voice, ebbing and flowing in volume, creating a smooth, wave-like movement. At 7:17, the handpan shifts to a richer rhythmic texture, building towards a climax and enhancing the sense of movement, before returning to the main melodic pattern at 9:32, which continues through to the end of the composition.

Keyboard

From the very first seconds, the keyboard in the lower register provides an initial foundation, then fades to create space for the voice. Starting at 2:13, an effected keyboard sound seems to extend the lingering tone of the metallophone, continuing to serve as a continuous drone with dynamic shifts from soft to loud, which contributes to a gentle, rocking sensation. At 8:26, the classical piano sound introduces accents in the higher notes, then the lower, adding texture and contributing to the climactic development. In the final section, the keyboard plays single, isolated notes, leaving a sparse, resonant presence.

Music Analysis of Song - "On the way"

Instruments:

Keyboard, handpan, voice

Participants: Aleksandr Dostovalov – handpan; Taras Fenyk – keyboard; Olga Bogatyrenko – vocal

Timing:

13:27 minutes

Tonality: H minor (432 Herz)

The key of H minor was chosen to match the tuning of the handpan.

Form:

This composition maintains a continuous, repetitive sound from start to finish, with no significant changes. However, it can be conventionally divided into several sections based on the changes in the melodic pattern of the main instrument, the handpan.

- **Intro: (0- 3:56)**

  The composition begins immediately with a repeating melody played on the handpan, while the sounds of the keyboard subtly complement it. Gradually, the voice enters, sounding very transparent in this section, framing the tone of the handpan.

- **Part 1: (3:56 - 8:54)**

  Starting at 3:56, the handpan shifts its melodic pattern, and the voice begins to sound slightly more prominent. Until 8:54, the music flows smoothly and without significant changes, allowing the listener to surrender to the soundscape without actively analyzing the unfolding events.

- **Part 2: (8:54 - 10.34)**

  At 8:54, the voice begins a new narrative, while the handpan fades, creating a soft foundation for the voice.

- **Outro: (10.34 - 13:27)**

  At 10:34, the handpan changes its melodic pattern, leading to a brief climax, while the voice quiets. Following this, with the background hum of the keyboard, the composition gradually progresses towards its conclusion.

Timbre and Instrumentation

This composition is entirely built around the leading, repetitive sound of the handpan, which maintains a soft and smooth tone up until a brief culmination at 10:34. The keyboard primarily provides a subtle, sustained buzzing backdrop, only delicately complementing the sound with light tones between 1:09 and 2:19. The timbre and melodies of the voice are similarly simple, without any sharp fluctuations or significant changes. The repetitive nature of the sound, combined with the clarity of the textures, creates a sense of softness and fluidity throughout the piece. This approach to sound design, where repetition plays a key role, fosters a calming and immersive atmosphere, enhancing the listener's experience of continuity and relaxation.

It is also important to note that the use of a lower frequency tuning of 432 Hz creates an even deeper and softer immersion into the sounds and atmosphere of the composition. This frequency is often associated with a sense of calm and harmony, further enhancing the meditative qualities of the piece. The resonance of 432 Hz is believed to resonate more naturally with the human body, facilitating a greater sense of relaxation and emotional balance for the listeners, although this is an unproven fact and merely a subjective experience reported by listeners.

Music Analysis of Song - "Lost and found"

Instruments:

Keyboard, forest flute, voice

Participants: Aleksandr Dostovalov – forest flute, bells, kalimba; Taras Fenyk – keyboard; Olga Bogatyrenko – vocal.

Timing:

10:17 minutes

Tonality: E minor

Form:

- **Intro: (0:00 - 1:40)**

  This section can be considered as the introduction, as it features the sound of bells and a touch of kalimba, creating a fairy-tale, light atmosphere. The keyboards, in addition to their harmonic foundation, produce high-pitched sounds that are very transparent and delicate.

- **Part 1: (1:40 - 4:00)**

  Starting at 1:40, the sound of a forest flute enters, playing solo, as if someone has begun to tell their story.

- **Part 2: (4:00 - 7:03)**

  At 4:00, the voice enters, seemingly responding to the flute, and continues to support the conversation. The voice and flute now form a duet. As the section progresses, the voice begins to tell its solo story, while the flute responds.

- **Part 3: (7:03 - 10:17)**

  Beginning at 7:03, the accompaniment shifts to lower sounds, adding a sense of drama to the conversation between the flute and the voice. Then, textured keyboard sounds with high pitches gradually join in, as the narrative comes to a close.

Timbre and Instrumentation

Keyboard

In this composition, the keyboards play an essential fundamental role in the accompaniment, with a richly textured sound. The use of the 4th, 6th, and 1st steps in the chord progression makes the melodic movement somewhat predictable, but not overly so, preserving an atmosphere of mystery and an unclear spatial feeling. The shift in texture, from high notes as in the intro (0:00 - 1:40) to dense sounds in the lower register as heard at 7:30, allows the keyboards to infuse the composition with a range of emotional colors.

Voice and forest flute

In this composition, the flute and voice parts function as a solo duet, intertwining or responding to each other with distinct phrases. Due to its texture, the forest flute occasionally resembles the sound of a voice, while the voice at times mimics the flute, creating the impression of a conversation between two voices.

Summary

This research explored the therapeutic potential of meditative music, combining theoretical analysis and practical composition to examine its effects on relaxation, stress reduction, and mindfulness. Drawing from scientific literature, the study highlighted key mechanisms through which meditative music impacts the listener. It was shown to reduce cortisol levels, activate the parasympathetic nervous system, modulate brain activity by aligning with alpha and theta frequencies, and decrease amygdala activity, leading to emotional regulation and enhanced focus. Essential characteristics of meditative music, such as slow tempos, repetitive patterns, and stable harmonies, were identified as pivotal in fostering calmness and immersive experiences.

Instruments like the shruti box, handpan, and singing bowls played a central role, offering sustained tones and textures conducive to a meditative state. The practical component involved live improvisations and recordings, beginning each session with the "OM" mantra, which helped performers and the sound engineer establish focus and cohesion. Listener feedback, while limited to a small group, confirmed the compositions' ability to induce relaxation and mindfulness, validating their therapeutic efficacy.

On a personal level, engaging with the music significantly enhanced the researcher's focus and productivity, facilitating the rapid completion of the study. Despite its promising findings, the research faced limitations, including the lack of a broader audience for feedback and insufficient exploration of technical approaches to optimizing favorable frequencies. These limitations suggest avenues for future research, such as studying the precise effects of specific frequencies, gathering diverse listener feedback, and developing advanced methods for integrating sound well-being principles into compositions.

Overall, this study demonstrated the profound capacity of meditative music to promote relaxation and mental clarity, while also highlighting its potential as a tool for enhancing productivity and emotional well-being. The findings contribute to the broader understanding of meditative music's applications, offering a framework for further exploration into its role in sound healing, mindfulness, and cognitive enhancement.

Recommendations for further research

Since this study revealed that there is very little information available about the relatively young instrument, the handpan, and limited knowledge regarding how it might affect the listener and contribute to a deeper immersion in a meditative state, I would recommend focusing on this instrument. In practice, the handpan has proven to be highly effective. Further research could explore its specific impact on psychological and emotional states, the nuances of its acoustic properties, and its potential in sound therapy or meditation. Investigating how the handpan interacts with different frequencies and the human brain could provide valuable insights into its therapeutic benefits and expand its use in wellness practices.

This practical thesis project has significant practical outputs that should be listened to in conjunction with the written element.

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