Full-Length Article

Protocol for a Neurophenomenological Investigation of a Guided Imagery and Music Experience *(Part I)*

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Abstract

This article, Part I of II, describes the rationale and background literature of an investigation into a music and imagery (GIM) experience modeled upon the Bonny Method of Guided Imagery and Music[1]. This investigation aimed to obtain an integrated description of participants' subjective experiences and electroencephalographic (EEG) responses during the GIM session in order to gain understanding into the integrated neuronal and experiential demands of imaginal listening to music while in an altered state of consciousness (ASC). Neuroscience research has demonstrated the utility of EEG for investigating neuronal responses during ASCs, imagery, and music experiences. Additionally, several phenomenological studies have provided insight into the value and nature of client imagery in GIM contexts. Given evidence of both psychological and physiological benefits of the Bonny Method, and given the ever-growing neuroscience literature relating to phenomena occurring in GIM, there are likely relationships between participants' imagery experiences and their brain behavior during a GIM session. This foundation justifies the use of neurophenomenology as a means of integrating individual participants' EEG traces with their descriptions of their imagery experiences during a GIM session in order to obtain a description of the relationships between their subjective and neuronal phenomena.

Keywords: ***Bonny Method, Guided Imagery and Music, neurophenomenology, EEG, Neuroimaging.***

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Introduction

The Bonny Method of Guided Imagery and Music is a music psychotherapy approach developed by music therapist Helen Bonny in the 1970s. While it can be used in both individual and group formats, its theoretical foundations originate in Bonny's work with her individual clients[3]. In these sessions, the client and therapist identify a clinical focus for the session, the therapist selects music to address this focus, and then the therapist assists the client with entering into an altered state of consciousness (ASC). At this point of the session, the therapist (also referred to as a "guide" in Bonny Method contexts) plays a selected program of recorded music, usually from classical and romantic eras of Western classical music, and then dialogues with the client about imagery experiences she/he is having in response to the music. The therapist does not direct the client's imagery, rather she assists the client in entering the imagery experience as fully as possible. The therapist does this through verbal interventions that prompt the client to engage with whatever sensory images are involved in the experience, in order to flesh out the imaginal scene. By doing so, the image becomes as vivid as possible, bringing to life not only the environment and objects in the scene, but meaningful persons, situations, and emotions that are present for the client. The therapist then continues to support the client's engagement and interaction in the imagery, always following the client's lead. Thus the client is encouraged to connect with conscious and subconscious conflicts and internal resources, and with the music which both challenges and supports the client [4]. After about 20-50 minutes of the music and imagery experience, the therapist assists the client in closing the imagery experience and returning to full conscious awareness. Then the client and therapist process the imagery experience, perhaps using visual art (e.g., drawing mandalas) or through verbal discussion [5]. Clients usually contract with a therapist to engage in a series of Bonny Method sessions to work through a particular therapeutic concern.

At the heart of the Bonny Method is the client's engagement in his/her imaginal response to music while in the ASC, as it is through this experience that clients gain insight and experience intrapersonal change. Therefore this therapy approach is contraindicated for clients who have difficulty differentiating their perceived reality (e.g., psychosis) from

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external reality. It is primarily utilized by high-functioning clients seeking self-actualization or clients with good ego strength who need to work through depression, trauma, grief and loss, and other mental health conditions other than those involving psychosis. Several case studies and qualitative studies have attempted to explore what clients undergo when they engage in Bonny Method experiences [6–16]. Though these studies are insightful and descriptive, they do not investigate the in-situ integration of psychological and biological experience during therapy sessions.

Based on my experiences as a Bonny Method client and therapist, I know that imagery experiences during these sessions are embodied, life-changing, and deeply meaningful; they integrate body and mind seamlessly, causing and complementing each other, and impacting daily life. This integration plays a major role in how any psychotherapy facilitates change, but particularly in the Bonny Method which is experiential, aesthetic, and holistic, and claims to utilize the mind-body connection in order to facilitate healing, including in medical contexts[17–22].

When I began training as a therapist in the Bonny Method of Guided Imagery and Music, I was required to experience the method as a client. For nearly two years, I underwent biweekly sessions with a fully-trained Fellow. My experiences during these sessions were so vivid that I can easily recall them many years later. In those sessions, lying on a mat, I listened to the therapist guide me to relax my body, and then listen to the beautiful and evocative music she had selected to meet the concerns I brought to the session. She then guided me to open my full awareness to the music so I could explore whatever my imagination offered in response.

I remember in particular one session toward the end of our work together, which encapsulated much of what I had encountered and faced in previous sessions. The therapist had selected a version of the Solace program [2](p556). As Sibelius' *Swan of Tuonela* swelled, I revisited a previously sorrowful image of the World Trade Center towers, gutted and black from the terrorist attacks of September 11, 2001. I entered the top floors of the tower and proceeded to climb downward, drawn by the Boccherini Cello Concerto; when I reached the bottom, I found that the ground was solid. As the music moved into the Russian folk song *O the Steppes* and the Russian chant *The Joy of Those Who Mourn,* I felt the building become a sacred place, and a source of my vitality. With this connection to the space, my body began to transform into the building itself, and with the second movement of the Shostakovitch 2nd piano concerto, I felt the tower knit itself back together as one with my body. My legs and torso felt as strong as steel beams, driven into the earth; I was sold and clear and me in every inch of my being, with the music resonating within my body and reinforcing this feeling.I had many other powerful imagery experiences prior to this one, each building on the one before. These experiences had in common a sense of embodied emotion which made the imagery feel very vivid, real, and meaningful. I count these experiences among the most profound in my life, as I gained important insights about my sense of self, my worldview, and my relationships with others.

Later, as I practiced the Bonny Method and then began conducting music therapy research, I wondered what exactly my clients and I were internally experiencing during sessions. What made the imagery experiences so powerful, and how was it that my clients sometimes had vivid, impactful experiences and sometimes they did not? What was the nature of the embodied imagery that we perceived as being an integral part of the meaningful experiences in Bonny Method sessions? If I knew this, could I, as their therapist, help facilitate more such experiences in order to promote growth in therapy? And are those experiences necessarily desirable to promote growth in therapy?

In the decades after Bonny developed her method, practitioners began recognizing risks in uncovering unconscious material using music and imagery. Despite initial confidence that "negative" material would be easily resolved through the music-imagery experience, years later Bonny recalled,

> We have learned that music does not automatically change what we call negative into positive… the purposes for [the Bonny Method] are to allow parts of ourselves to be exposed and explored. This process is not always pleasant or comfortable. It can be frightening and nonproductive if such experiences come to us when we are vulnerable and alone.[23](p148)

Due to these concerns, over time Bonny Method practitioners drew from their clinical experience to develop modifications of both group and individual work for various clinical populations[15,24–28]. Some of these modifications involve shortened music programs, music from genres other than the Western classical tradition, semi-directed guiding scripts, or group-based experiences. Because these modifications still involve the client's imaginal listening to music during an ASC, they are still generally regarded as "Guided Imagery and Music (GIM)," which serves as an umbrella category of interventions of this type; however, these modified approaches are not pure Bonny Method interventions[29]. Given that Bonny Method/GIM therapists work with clients who may be in physically or psychologically vulnerable states that could be contraindicated for the Bonny Method, it is vital to understand what clients undergo during the music-imagery experience, including the demands of integrating mind-body perceptions, and whether and how these GIM modifications appropriately address these demands.

Currently, our understanding of the neurological processes related to the Bonny Method or GIM experience is primarily theoretical in nature [30–32] and does not yet draw from endogenous, in-situ clinical evidence of subjective experience and neurological activity. The present research aimed to address this lack of direct knowledge by examining what occurs during a GIM session from the participant's perspective in terms of both subjective experience and objective brain activity. I examined both perspectives concurrently to find how they relate to each other for each participant. By doing this, I attempted to provide as complete a description as possible of what a participant undergoes during the music and imagery portion of a session, illustrating relationships between mind and body. Toward this end, the following sections summarize the available research concerning EEG and ASCs, Imagery, Music, and GIM, and phenomenological investigation into clients' experiences in GIM, respectively.

Related Literature

EEG and Altered States of Consciousness (ASC)

There have been many EEG investigations of phenomena related to the ASC utilized in GIM. Overall, these studies have shown that alpha waves increase in power and synchronization during relaxation into an ASC[33,34], and that theta waves increase in power and synchronization during contemplative and meditative experiences[34,35]. Studies have also linked strong frontal-midline theta waves to concentration and meditation, as well as decreased sympathetic nervous system activity[36]. Other research shows that alpha power increases particularly during imagery experiences, whereas during REM sleep gamma band activity seems to indicate the involvement of emotional and memory structures which may be activated in order to access and bind memories related to the imagery[37].

Meditation practices encompass another category of altered state experience that has also garnered attention in cognitive neuroscience. Broadly speaking, early research into EEG and meditative states from the 1950s-80s showed overall increased alpha power, indicating inhibited cortical stimulation[38] whereas attentional focusing is associated with decreased alpha power in the corresponding sensory region[39–41]. Other studies found associations between meditation and theta frequencies; for example, frontal midline theta activity occurring during attention-demanding meditation[36], and frontal midline theta combined with increased anterior frontal and midline theta synchronization and enhanced theta connectivity over long-distances during experiences of meditation-induced blissful states[42]. Additional research on experienced Buddhist meditators who focused on "unconditional loving-kindness and compassion" showed increased synchronization at high-amplitude gamma frequencies, which increased for more-experienced meditators[43].

As research into meditation became more sophisticated, researchers found the need to distinguish particular practices due to the neurological and psychological differences among the wide range of meditation approaches[44], initially defining Focused Attention (FA) methods and Open Monitoring (OM) approaches[45]. Additionally, Travis & Shear[46] have proposed yet another category of meditation experience, Automatic Self-Transcending (AST). Travis & Shear collated the EEG literature regarding these three categories of meditation and determined that, generally speaking, FA meditation would involve increased activity in higher-beta (beta2) and gamma bands, OM meditation would be associated with frontal midline theta, and AST meditation would involve increased frontal alpha power and coherence. Finally, research into Mindfulness-based meditation approaches have found evidence of top-down alpha changes indicating increased control of emotions[47], where the focus on internal somatic states serves to filter extraneous stimuli, whether from distracting thoughts or the environment. Each of these methods implicate aspects of the GIM ASC—for example, focus on an internal experience or image is similar to FA meditation, whereas the induction experience at the start of a GIM session can be similar to OM meditation and mindfulness meditation. However, no single meditation approach fully relates to the varied experiential imagery that is unique to GIM.

Another interesting link between the neuroscience research on meditation and GIM is that the hallucinogenic drug LSD causes theta wave production in the amygdala and hippocampus, part of the emotional and memory centers of the brain[48]. Therefore it seems Bonny's experience with research using LSD, music, and imagery in her early work[49] likely took advantage of this effect of the drug on these brain structures.

EEG and Imagery

In brief, the EEG literature related to imagery indicates that, generally, the modality of the imagery, whether visual, emotional, kinesthetic, etc., is reflected in the sensory areas of the brain known to process that sensory modality[38,48,50–53]. Wider neural networks become involved when imagery is original or creative in nature (cross-hemisphere activity) and when imagery has emotional and/or memory content (subcortical activity)[54]. However, EEG responses are highly individualized and may be dependent upon the vividness of the imagery and the degree of focus upon that particular image.

EEG and Music

Though neuroscientists have used many different imaging techniques to examine how the brain processes and responds to music, the electroencephalogram (EEG) is well-suited for this purpose because of its high temporal resolution, which can measure nearly instantaneous responses to stimuli[55]. It is also far less invasive, expensive, and procedurally cumbersome compared to other imaging methods such as functional magnetic resonance imaging (fMRI) or positron emission tomography (PET) scans. EEG measures electrical brain activity through many electrodes that are placed on the scalp; these electrodes detect very small changes in electrical activity through the skin and skull. The electrodes transmit the detected signals through an amplifier and software which then displays each electrode's signal on a computer screen. When many electrodes are placed in standardized locations across the scalp, researchers can use computer software to quantify and analyze these signals to determine how the entire brain responds to particular events or to ongoing stimuli, such as music[56].

Despite a recent proliferation of EEG research in music listening on emotions[57–59] and in effectiveness of music therapy[60] only a few published studies examine the experience of listening to whole pieces of music. Music cognition studies typically examine responses to short excerpts of music or particular electrophysiological responses to repeated presentations of brief, isolated musical stimuli[61]. In one example utilizing whole pieces of music, researchers[62] traced brain processing of subjects' listening to a recording of a Mozart string quartet by tracking changes in power of brain waves (the amplitude, or strength, of the waves), median frequency (the median range of the electric signal, measured in Hz), and coherence parameters (whether and where brain signals were synchronizing between two different electrodes); the researchers concluded that all three conditions were affected by music listening. They also found that extended brain regions seemed to be involved in processing music (frontal, temporal, precentral, and across hemispheres). Due to this, the researchers noted that it is "hopeless" to try to confirm a strict lateralization of musical functions in the brain, because of the varied, wide-ranging, and cross-hemispheric changes during the musical tasks[62](p75).

In another study, Fachner[63] compared four participants' EEG responses to music before and after smoking marijuana (THC-induced altered state of consciousness). The comparisons found post-THC increases in parietal alpha power and overall increased power in temporal and occipital areas. Alpha frequencies are believed to be a sign of a passive "idle state" in the brain, while beta frequencies have been called a "bridge between the external world," and theta frequencies have been viewed as a link to "the internal world"[64](p344). Fachner[63] also found that theta frequencies changed in temporal areas, and he felt this corroborated the participants' perception of altered time while in the post-THC state.

EEG and GIM

Lem [65] has published the only previous investigation of EEG in a GIM context. This pioneering research compared the author's psycho-acoustic profile of a commonly-used Bonny Method music selection with EEG responses and reports of imagery. In order to investigate broad patterns of brain responses to the GIM experience, this mainly quantitative study examined 27 subjects' EEG responses which were averaged to create a composite EEG trace for comparison with the psycho-acoustic profile of the music selection, *Concertstück for Harp and Orchestra* Op. 39 by Gabriel Pierne [66]. Lem adapted Bonny's "affective contour"[67] to include not only a division of the music into segments according to his perception of the piece's affective intensity, but also as a digitally-produced wave form plotted as a graphic representation, which together he termed the "psycho-acoustic profile"[65](p8). The author compared this to the composite EEG traces from 27 students who listened to the music, and to imagery reports collected after the EEG data collection was complete. The author found a link between sudden bursts of the EEG activity and participants' visual imagery, and he also found a correlation between the overall frequency changes in the composite EEG and the intensity of sound as depicted by his psycho-acoustic profile of the music. As an initial foray into such research, this work shows the great potential for investigating relationships between participants' imagery and brain responses. In this regard, the study leads to further questions worthy of investigation: how do other types of GIM-induced imagery relate to neuronal responses? How do individual subjects' subjective experience of the music, imagery, and ASC relate to their neuronal responses? Such questions demand a research approach that can account for individual, subjective data collection and analysis alongside the EEG data.

Phenomenological Research in GIM

Several phenomenological studies have examined the client's experience with the Bonny Method/GIM [6,10,11,68,69]. Many of these studies examine participants' imagery reports shared with, and transcribed by, the therapist during the session, yet few researchers have examined the client's meta-awareness of the imagery experience during the session—that is, what they experienced, but may not have fully explained or reported in the moment. However, the aforementioned studies demonstrate that the phenomenological approach can successfully examine and elucidate individuals' subjective experiences in a GIM context. Thus phenomenology appears to be a useful approach for this purpose in the present study. What this research question requires is a means of integrating phenomenological data of the GIM experience with individual neurological responses to the same experience. Neurophenomenology is a means to achieve this integration.

Neurophenomenology

Varela[70] developed neurophenomenology as a means to examine first-person, subjective experiences in conjunction with third-person objective data. The crux of this methodology is that both subjective and objective evidence have equal value; in this way:

> Phenomenological accounts… can provide direct experiential validation for a neurobiological proposal (conditional to a rigorous methodological examination); [and] structural aspects of human experience itself can constrain the interpretation of empirical results[71](p135).

These principles recognize the fact that individuals' experiences have both subjective and objective perspectives which are parts of a whole given experience. Therefore, both phenomena can be studied in an integrated fashion.

In an early study using neurophenomenological methods [72], participants engaged in an optical illusion task over many trials while researchers collected EEG data. Later, the participants, who were trained in reflexive awareness, described the experience of completing the task, and these descriptions were reduced into patterns of experience (states of readiness) across individuals. Correlating the EEG data and these first-person categories of experience revealed relationships between reaction time and level of readiness for the task, as well as instances of synchrony between various brain regions related to the states of readiness. Overall, the data corroborated and further explained previous findings in cognitive neuroscience research by confirming the location of particular brain functions while demonstrating how these functions were mediated by degrees of attention to the task. Thus, the methodology showed how first-person data can inform and explain objective, third-person data in a meaningful way.

In summary, conventional cognitive neuroscience offers some guidance regarding brain activity associated with ASCs and imagery phenomena like those seen in GIM, however the methodology used to obtain this information requires aggregating data from large subject pools and many trials of stimuli[73]. The methodology therefore removes the data from both the individuals' experiences as well as the context in which they are usually experienced. Phenomenological research in GIM offers rich descriptions of particular kinds of client experiences, but has not been able to describe the mind-body connection during a GIM session. Neurophenomenology offers a means of integrating subjective and objective data in order to add a new dimension to both kinds of data; seen in each other's contexts, it may be possible to understand the interaction of body and mind in GIM.

Therefore, the objective of this project is to obtain a description of the GIM experience through an application of neurophenomenology to the GIM context by finding relationships between participants' objective EEG data and their concurrent subjective imagery and experiential data. The aim of finding these relationships is to reveal patterns of subjective and objective responses to gain understanding of what occurs within an individual during a music and imagery session. The study's specific research question is: under different types of guiding interventions, what brain activity (EEG coherence and alertness states) occurs, and how does this activity relate to the concurrent subjective experiences (e.g., listening and imaging) as verbally described by the individual participants?

Conclusion

The Bonny Method has been valued for its ability to evoke profound psychological and physiological benefits through its use of the mind-body connection, often identified by clients as a sense of embodied and deeply felt experience of the music and imagery in sessions. However, because of the "uncovering" nature of exploring unconscious material in this approach, practitioners utilize the Bonny Method with great care to prevent psychological injury. The nature of these music-imagery experiences need to be understood more fully, not only to better harness the therapeutic power of them, but also to apprehend the neurological and psychological demands they make on all clients, particularly those who are vulnerable due to trauma or other psychiatric conditions.

Investigating both neurological and experiential data in the GIM context is possible due to the foundation laid by existing related neuroscientific and phenomenological research. The EEG literature regarding brain behavior during ASCs, imagery, and music listening experiences show many possible areas of overlap with Bonny Method and GIM experiences. Furthermore Lem's[65] pioneering investigation into EEG responses to imaginal listening to a single Bonny Method music selection demonstrates the feasibility and opportunity for further exploration of EEG and GIM. Several pheneomenological studies regarding client experiences in GIM have explicated ways clients respond to both music and imagery, and how these experiences lead to therapeutic change. Integrating both EEG and phenomenological investigation into the in-situ context, via the principles of neurophenomenology, has great potential for exploring the relationships between mind and body in the GIM experience. Therefore, in Part II, I will describe the process I undertook to develop the research methodology of this study, and will provide a focused discussion of clinically-relevant phenomena that occurred during the data collection procedure.

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