A Neurophenomenological Investigation of a Guided Imagery And Music Experience: Protocol and Methodological Challenges

Andrea McGraw Hunt, PhD; MT-BC
Fellow, Association for Music & Imagery
Department of Music, Immaculata University, USA

This research investigated participant responses to a modified Bonny Method session by applying the research method of neurophenomenology. The research aimed to integrate individual experiential reports with EEG data, leading to a description of neuronal and imaginal responses to the music and imagery experience. The presenter provided a step-by-step description of the neurophenomenological investigation, and discussed the clinical implications of the data collection process. In addition, the presenter described the methodological challenges in addressing such questions, and the problem-solving required to address them. The process of analyzing both kinds of data revealed additional questions about the nature of the GIM experience, as well as about the limitations of integrating the data, including: To what degree can participants fully convey their experiences to a researcher, and by extension, to a GIM therapist? How do participants recall their imagery experiences after the session, and what does this mean for practitioners during the session? To what degree can neuronal activity be attributed to specific imagery or perceptual experiences? What does a productive session look like from a neurophenomenological perspective? Pursuing these questions can lead to greater understanding of the mechanism of GIM’s effectiveness.

Keywords: the Bonny Method; Guided Imagery and Music; neurophenomenology; EEG; neuroimaging

Currently, our understanding of the neurological processes related to the Bonny Method or GIM experience is primarily theoretical in nature (Goldberg 2002; Körlin 2002; Perilli 2002) and does not yet draw from endogenous, in-situ clinical evidence of subjective experience and neurological activity. In this presentation, I discussed the methodology of my dissertation project (Hunt, 2011), which aimed to examine 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. This involved using electroencephalogram (EEG) measures, which were integrated with phenomenological data, an application of Varela’s (1996) methodology called neurophenomenology.

There is a large body of knowledge regarding relationships between EEG and the many facets of travelers’ experiences in Bonny Method work. For example, concerning the altered state of consciousness (ASC), researchers have investigated brain states related to relaxation, dream states, and meditation. Of note is the involvement of gamma band activity during REM sleep which, may indicate involvement of emotional and memory structures in order to access and bind memories related to the imagery (Hori, Ogawa, Abe, & Nittono 2008). Literature regarding various categories of meditation involves increased frontal alpha power and coherence (Lutz, Slagter, Dunne, & Davidson, 2008). In terms of imagery, 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 (Gerardin, Sirigu, Lehéricy, et al., 2000; Levine, Warach, & Farah, 1985; Overton, 2004; Pfurtscheller, Scherer, Müller-Putz, & Lopes da Silva, 2008; Posner & Raichle, 1997; Wherisson, Kuhtz-Buschbeck, & Forssberg, 2002).

Very few studies examine neuronal responses to complete pieces of music; traditional neuroscience methods instead focus on brain responses to isolated musical elements or features. These few studies indicated that musical responses cannot be lateralized to either the right or left hemisphere (Petche, Pockberger, & Rappelsberger, 1987), whereas music listening while in a THC-altered state leads to increased alpha power in temporal and occipital regions, as well as changes in theta frequencies in temporal areas (Fachner, 2002). Prior to this project, one researcher examined EEG traces in a GIM context (Lem, 1998). This pioneering study pooled 27 participants’ responses to Pierne’s Concertstück for Harp and Orchestra. He found that participants showed sudden bursts of EEG activity and participants’ visual imagery, as well as a correlation between overall frequency changes in EEG and the intensity of sound as depicted by Lem’s psychoacoustic profile of the music. This research, along with the previously cited literature, demonstrates the relevance of EEG for investigating participants’ neuronal responses to the Bonny Method experience.

However, all these studies focus on pooled responses to the ASC, imagery, and music and imagery experiences. They do not account for individual responses. In regard to this question, phenomenology has been applied to Bonny Method contexts in many cases, showing a great deal of utility for explicating participants’ experiences (Abbott, 2005; Bonde, 2005; Grocke, 1999, for example). Furthermore, in regard to the specific question of addressing first-person neurological and phenomenological data, Varela (1996) developed neurophenomenology. This methodology sought to integrate valid first-person experiential accounts with objective neurological measures. Two studies (Lutz, Lachaux, Martinerie, & Varela, 2002; Petitmengin, Navarro, & Le Van Quyen, 2007) showed the utility of this approach, all of them using EEG and phenomenological interviewing to obtain each type of data, which were then integrated to reveal novel information.

Therefore, the objective of this research was 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. Such an investigation would seek to reveal patterns of subjective and objective responses to gain understanding of what occurs within an individual during a music and imagery session. This presentation focused on the development of the methodological protocol utilized to address these aims and the insights I gained from this undertaking.

**SUMMARY OF METHODOLOGICAL PROCEDURES**

**Trial Session**

I developed the final procedures though a trial session I conducted with myself as a research participant. Because of the limitations of EEG regarding signal artifacts resulting from facial muscle movement, I had to modify the session to eliminate verbal reports of imagery during the music and imagery phase. Thus, I developed an open-ended script which was mixed over an abbreviated music program used in GIM--two pieces of music from the Nostalgia Bonny Method program (Bruscia 2002a), Alwyn: Oboe Concerto Grosso #1 (Siciliano) and Barber: Piano Concerto – second movement (Canzone – Moderato). I had a colleague conduct a phenomenological interview immediately after the music and imagery session, using the acquisition station’s video footage to prompt my recall of the imagery. After transcribing the session and analyzing the various imagery experiences, I realized that imagery of different modalities and types occurred simultaneously, overlapping with different beginning and ending moments. It was impossible to pinpoint specific imagery experiences to a split-second moment in the music, particularly
in a post-hoc interview. Therefore, I needed to contain and limit the types of imagery experiences through the direction in the guiding script.

**Modified Music and Imagery Script**

The modified script maintained the general narrative storyline of the original script, which fit the theme-variations structure of the music. The storyline encouraged participants to recall people and memories from their past by encountering and then exploring a house. The modified script encouraged participants to focus on one specific image modality (Visual, Kinesthetic, Body, Interaction, Affect, or Memory) in a given guiding intervention. Each guiding intervention, or “probe,” was paced to fit the music selections, with a minimum of ten sections of no guiding (music alone) following each probe. The script also included an induction phase and a return phase, as used in Bonny Method sessions. Each guiding probe in these phases also focused on a single imagery modality. Table 1 shows the frequency of each probe category in the session script.

Table 1. Frequencies of each probe according to category.

<table>
<thead>
<tr>
<th>Modality</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>14</td>
</tr>
<tr>
<td>Visual</td>
<td>16</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>3</td>
</tr>
<tr>
<td>Affect</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>3</td>
</tr>
<tr>
<td>Interaction</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

**Data Collection**

**Participants.** I recruited a small number of participants due to the large amount of data this project would generate. Four participants responded to appeals to local Bonny Method Fellows and to flyers posted in a local university. Inclusion criteria included experience in the Bonny Method as a client (but not a present or former client of mine); no neurological or physiological limitations to participating, no current neurologic or psychotropic medication use; history or brain injury or degenerative neurological conditions. The four participants ranged in age from 33 to 58, had all been experienced Bonny Method travelers (ranging from 25 to 70 personal sessions), and all of them had experienced at least Level I training in the Bonny Method.

**Equipment and Materials.** EEG was recorded at an outpatient EEG office using a NicoletOne station with 21 channels placed at common sites using the 10-20 system. Additional electrodes were placed for ocular artifact detection and reference and ground. Music and guiding script was recorded, mixed, and burned onto a CD, which was played on a Sony portable CD player. During the session, participants relaxed in a reclined position on the provided examination chair. Following the session, I recorded the phenomenological interview using a digital audio recorder.

**Procedure.** Participants were seen individually for their single session and interview. A lab technician connected each participant to the acquisition station and left the room for the session to proceed. After reminding the participant to remain silent during the session, and to follow each guiding intervention as closely as they were able, I began recording the EEG signal and started the music/script CD. The session began and ended with a short period of silence to collect baseline EEG signal for
comparison to each of the imagery conditions. Immediately after the music and imagery session, and after disconnecting the participant from the station, the participant and I moved to a private room where we could view the video recording of the session and conduct the phenomenological interview. The interview focused on Petitmengin-Peugot’s (2000) interviewing method, which focused on eliciting descriptions of internal experience. I recorded these interviews and then transcribed them for analysis.

**Data Analysis**

**Phenomenological Data Analysis Procedure.** Working with the transcribed interviews, I reduced the text into descriptive aspects of the experience and then sequenced each participant’s experiences according to chronological order (Petitmengin-Peugot, 2000). This latter task was necessary as participants often recalled imagery according to its vividness or importance rather than simply according to its occurrence in time. I then developed my own categories of imagery experience out of this and from my own imagery in the test session, and coded each probe’s imagery description according to these categories.

**EEG Analysis Procedure.** I marked the 10-second music-only segment for each of the 42 probes on each participant’s EEG record, labeling each segment according to its preceding probe category (Body, Visual, Affect, etc.). Coherence analyses were performed on the pooled data for each probe category in order to identify neural networks occurring during those probes. In addition, each participant’s coherence results were evaluated by frequency band to identify the meaning and functional significance of the neural networks. Raw EEG signal was also reviewed to determine each participant’s level of attention throughout the session, noting where participants were relaxed-alert, drowsy, and asleep. These interpretations were incorporated into the coherence results along with the phenomenological data.

**Within and Cross-Case Interpretation of Analyses.** I compared each participant’s phenomenological codes for each probe category to the corresponding coherence and brain state interpretations, and looked for patterns and differences within each case. I then compared these patterns and differences across the four cases.

**MAIN IMPLICATIONS**

Despite the need to modify the clinical experience from a typical Bonny Method session, this research still involved creative, imaginal listening to music while in an altered state; thus, the participants’ experiences still contain the essential features of the Guided Imagery and Music experience as defined by Bruscia (2002b) and this research has implications for GIM practice. Therefore, this study provides preliminary data that will guide future investigations and practice of GIM. Such knowledge is essential to understanding the demands of the GIM experience, considering the potential risks for negative or even re-traumatizing experiences that may emerge via vivid imagery. Future investigations need to account for the following clinical and methodological challenges in order to accurately examine the in-situ demands of undergoing a Bonny Method session.

Future in-situ research needs to account for the multi-faceted and complex nature of the participants’ imagery, often involving simultaneous and multisensory experiences. Clients may not be able to find words, space, or even the wherewithal in the moment to clearly report to their guide what is occurring during the session, thus necessitating post-session interviews to obtain a complete report of the imagery experience. Thus, pinpointing the exact moment an image occurred and correlating that experience to EEG traces is near impossible. Researchers may need to find other types of experiences or means of tracking experiences (e.g., broader categories of phenomena, behavioral observations) to make these connections.
There may be indications of brain states related to beneficial imagery experiences in the GIM context. Participants tended to report their imagery in the post-session interview according to their vividness or meaningfulness, and not necessarily according to the sequence in which they were experienced in lived time. However, those participants who had little difficulty remembering the ongoing narrative and sequence of imagery events also had more global gamma and beta coherence, implicating global attention and information binding. Similarly, the one participant who engaged in challenging imagery experiences showed the widest and most pervasive high beta and high gamma networks. A possible correlating brain state for these imaging phenomena beg the questions—to what degree does the client’s choice to actively engage with challenging imagery and to sustain the imagery narrative affect the client’s ability to do so, and to what degree does brain state influence one’s ability to engage with challenging imagery? To what degree is the clinical process related to neural processing? Understanding the mechanisms of the imagery experience in the Bonny Method/GIM can help practitioners refine the method and determine best practices, tailoring it to meet the neurological and psychological capabilities of clients.

Acknowledgments
The author wishes to express deep gratitude to Dr. Kenneth Bruscia, advisor on this project, for his steadfast dedication, encouragement, and support. The author also acknowledges the helpful feedback and support of Dr. Cheryl Dileo, Prof. Richard Brodhead, and Dr. Alison Reynolds, members of the dissertation committee. The author would also like to thank Dr. Bryan Muller, Dr. Mercedes Jacobsen and the staff at Temple University Hospital EEG Lab, Dr. Richard Greenblatt and Dr. Demetri Voreades of Source Signal Imaging, Inc., Dr. Joshua Jacobs, and Mr. Neil Hunt for their support and assistance on this project.

Address for correspondence
Andrea McGraw Hunt, PhD, MT-BC
Department of Music, Immaculata University, 1145 King Rd., Immaculata, PA, 19345, USA. Email: ahunt1@immaculata.edu

Note
This paper is a summary overview of work that has previously been published. The full papers can be found at:

References


