

Exploring the Experience and Effects of Vocal Toning

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Background: *Toning is a form of vocalizing that utilizes the natural voice to express sounds ranging from cries, grunts, and groans to open vowel sounds and humming on the full exhalation of the breath. Music therapists are increasingly utilizing toning in their clinical practice for a variety of therapeutic aims. Yet the effects of toning are not widely understood, with limited research to date.*

Objective: *To gather and analyze descriptive data to better understand the experience and effects of self-administered toning. Primary aims were to: 1) understand participants' experiences with toning, and any effects resulting from their experiences; 2) measure participants' emotional response to toning and singing; and 3) examine similarities and differences across the two datasets.*

Methods: *Participants were 20 adults, ages 20–40 years, who were non-musicians. We conducted semi-structured interviews and used qualitative content analysis to identify major themes and subcategories*

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related to participants' toning experiences. Participants also completed a 48-item questionnaire on music and emotions. Results from the interview and questionnaire data were then compared and contrasted.

Results: Results indicate that shifts in attention, awareness, and consciousness frequently occurred when individuals engaged in toning. "Meditative," "calm," and "relaxed" were the three most common descriptors of toning. In contrast, singing evoked stronger emotions and associations than toning, with the three most common descriptors including "nostalgia," "tenderness," and "joyful activation." Findings also suggest that the physical experience with vibrations and the sound of one's own voice may be attributes of toning that likely contribute to its success in inducing altered states of awareness, attention, and consciousness.

Conclusions: This study significantly expands our understanding of the experience and effects of toning, and has direct implications for clinical practice, including the identification of effective strategies to successfully engage adults in toning.

Keywords: toning; voice; singing; music therapy; qualitative; mixed methods; interventions

Introduction

Toning encompasses a variety of vocally based interventions that utilize sounds rather than words, and which are considered to have therapeutic value. Toning does not involve the use of a set melody or rhythm, as is typically found in singing songs or chanting. Rather, sounds are generally freely improvised with specific therapeutic intentions. Directions are sometimes used, such as the directive to use open vowel sounds or a "hum," or to find a sound that resonates in a particular part of the body. Certain forms of toning, such as the improvised expression of open vowel sounds on the full exhalation of the breath used in this study, can be characterized as musical in nature, fitting the standard definition of singing: "To make musical sounds with the voice" (*Oxford Dictionary of English*, 2005, p. 1651). Musical sounds are defined as "periodic and somewhat regular," which would apply to this form of toning, as it is closely tied to the fairly regular rhythmic cycle of breathing occurring when individuals are focused on the act of toning. Toning is considered a form of vocal improvisation that fits within the frame of musical improvisation for health and well-being.

MacDonald and Wilson (2014) cite reductions in tension, stress, or anxiety as among the mental health benefits of improvisation. Improvements in self-esteem, self-confidence, self-awareness, or emotional well-being have also been cited (Pothoulaki, MacDonald, & Flowers, 2012; Magee, 2007; Oldfield, 2006).

Toning is considered an ancient practice (Boyce-Tillman, 2000; McClellan, 1988) that has taken on modern forms. Music therapists were first introduced to the concept of toning through the work of Laurel Keyes, whose book *Toning: the creative power of the voice* (1973) is considered a seminal work in the area of therapeutic vocal sound work. Keyes's approach begins with the making of low grunts and groans, followed by open vowel sounds in ascending notes, with the sounds rising higher and higher until the toning session ends with one clear tone signaling a completion of the healing. Filled with anecdotal stories regarding the effectiveness of the technique, Keyes said it energizes the body and mind, releases stress, and can eliminate pain. Since this time, other forms of toning have been developed or adopted from other cultures, first primarily by sound healers (Campbell, 1989; Garfield, 1987; Goldman, 1992; Purce, 1987), followed by music therapists (Austin, 2009; Loewy, MacGregor, Richards, & Rodriguez, 1997; Maranto, 1993; Rider et al., 1991). In current practice, the most common form of toning that has emerged appears to be the expression of open vowel sounds on the full exhalation of the breath (Goldman, 2008; Austin, 2009; Snow, 2011; Iliya, 2011).

Background

In the first empirical study of toning, led by music therapist Mark Rider (Rider, Mickey, Weldin, and Hawkinson, 1991), the effects of toning, listening, and singing on psychophysiological responses were compared among musically trained subjects ($n = 17$). Results indicated that improvised toning on a comfortable pitch for 10 minutes (self-administered) resulted in significantly lower heart rate than in a condition in which subjects engaged in singing familiar songs. The authors suggest the most likely cause is because of the deep breathing that is naturally induced through the practice of toning, thus triggering a relaxation response. Previous to this, the "relaxation response" was described as the outcome of various practices involving altered states of consciousness (Benson, Beary, & Carol, 1974).

A limitation to this study was that it tested only musically trained adults. Acknowledging this, the authors called for further research with non-musicians.

Crowe and Scovel (1996) reviewed current sound healing practices in the United States and called on music therapists to open a dialogue with practitioners of sound healing. Toning was among these practices, which had been developed more extensively in the sound healing community up to this point than among music therapists (Halpern, 1985; Goldman, 1992; Garfield, 1987; Gardner, 1997; Gardner-Gordon, 1993; Campbell, 1989). It should be noted that in the sound healing community, toning was often simply called sound healing. Snow (2011) was the first researcher and the first music therapist to conduct a study of sound healing in the form of vocal toning as developed by sound healer and acupuncturist Simon Heather in the United Kingdom. This ethnographic study investigated a method consisting primarily of toning open vowel sounds, either in individual sessions with client and practitioner, or in group settings in which participants toned together. Participants interviewed for the study were aware of the potential therapeutic benefits of sound healing (toning) before experiencing it. Most experiences described in the study involved participants *receiving* toning done by a practitioner for them. It was found ($n = 13$) that the most commonly described benefit of toning was physical relaxation. Study participants described the effects of toning in holistic terms, often experiencing effects on more than one level of the following spectrum: physical, mental, emotional, psychological, and spiritual. Among these effects were emotional release, feelings of calm, profound spiritual experiences, psychological insights, and a change in mental thinking patterns. Physical relaxation was the most common effect cited. Additionally, sensory experiences such as seeing colors or images, and hearing other sounds, were commonly experienced, as were altered states of consciousness. Because of the paucity of formal studies of toning, current music therapy practices of toning will be examined next, to present a broader context for the understanding of toning as a music therapy intervention.

Current Music Therapy Practice of Toning

Toning is used in two broad areas of music therapy practice: music therapy with a range of adult populations in the community,

and medical music therapy. The following discussion will address these two areas. In her method known as vocal music psychotherapy, [Austin \(2009\)](#) used toning with clients to foster an embodied connection to oneself, considered essential in trauma work with clients. Austin noted that toning can “induce an altered state of consciousness and mediate contents from the personal and collective unconscious to the conscious mind” (p. 31). She also noted its ability to release stress and emotions. [MacIntosh \(2003\)](#) used toning with sexual abuse survivors as a method for grounding, focusing, and remaining self-aware. The emphasis here was on connecting to the body by feeling the sound within the body as it is being made. According to the author, toning was enthusiastically engaged in, and women found their voices again through this process. “This created safety, empowerment and containment in the group environment that allowed for movement into more difficult material” ([MacIntosh, 2003](#), p. 19). [Iliya \(2011\)](#) found that toning in group work with individuals who were homeless and had mental illness fostered “group cohesiveness and socialization” and created “a powerful feeling of wholeness in the group” (p. 19). She also observed that it reawakened the mind/body connection within individuals. The mechanisms at work in toning that could help us understand how this intervention can create some of these therapeutic effects are not discussed by these authors, beyond noting toning’s ability to help individuals or groups connect to their own bodies by feeling the sound within as he, she, or they are making the sounds.

The application of toning in the area of medical music therapy, which uses music therapy interventions administered within a therapeutic relationship by credentialed music therapists within medical settings ([Dileo, 1999](#)), has grown significantly in recent years. One of the earliest references to toning in this milieu was [Maranto \(1993\)](#), who described toning as being used to “improve respiration and enhance relaxation. It is also used to regulate breathing, control pain, and enhance focus and concentration” (1993, p. 165).

In the area of pediatric pain control, [Loewy, MacGregor, Richards, and Rodriguez \(1997\)](#) discussed toning as an important intervention in achieving integration rather than distraction. Children were called upon to focus on bodily sensations, rather

than pull away from them, and toning was used to help move pain out of the body by serving as a release. The authors noted that “toning loudly in an improvisatory style may help the child integrate the hurt through vibration. Vocal tone can also resonate and vibrate specific areas of focus within the body” (Loewy et al., p. 48). Finally, “The integration of sound is two-fold. At the first level, rhythm, air and tone enhance a vibration of connection physiologically. At the second level, the painful music of the body encourages integration at the affective level, which connects the mind to the body and spirit” (Loewy et al., p. 48).

O’Callaghan and Magill (2016) mention toning as a technique used in oncology for adults under the category of “exploring new music.” This category also includes music improvisation, songwriting, therapeutic music lessons, unfamiliar precomposed music, and chanting. The authors described toning as being used in music therapy to “reduce tension, enhance energy flow, and to center attention,” as well as for pain control (p. 123). In a section on “Chanting and Toning,” both are described as being used “to enhance mindfulness and promote comfort and relaxation” and “concentration.” Chanting and toning can also help patients seeking ways to “regain a sense of control and/or improve ability to cope with pain or illness-related stress” (ibid.). In discussing how singing and chanting are used in end-of-life care by music therapists, Magill (2009) described “vocalizing tones and melodies,” which can “help facilitate communication and reminiscence, regulate breathing, focus attention, and foster feelings of peace” (p. 70).

Magill (2010) described music therapists working closely with patients in pain to engage cognitive processes, meaning to actively vocalize and “breathe” sound “to, in, around, and away from” the pain. The technique of toning also offers the patient a tool that he or she can use during pain episodes, such as vocalizing with exhalations to redirect thoughts onto a mantra or an inspirational image. In palliative care, toning is characterized as one of six “creative” techniques used for “relationship completion” (Clements-Cortés, 2016, p. 126). In addition, Hilliard (2006) mentions toning as an intervention utilized in a study comparing the effects of two music therapy approaches on compassion fatigue and team building of professional hospice caregivers.

Objectives

The primary objective of this study was to gather descriptive information concerning the experience and effects of self-administered toning. Many claims are now being made for the benefits of toning, yet little research exists to support these assertions. Descriptive information about the experience and effects of self-directed toning would be beneficial as we work to establish a body of foundational knowledge that is useful to music therapy clinicians and others, and to inform the direction of future research. Therefore, we conducted qualitative interviews directed at understanding in participants' own words their experience of toning and any effects they are aware of resulting from their experience. Because music commonly elicits emotional responses, we also investigated participants' emotional responses to toning and singing using the Geneva Emotional Music Scale (GEMS; [Zentner, Grandjean, & Scherer, 2008](#)), and then examined similarities and differences across the two datasets. Research questions that guided the current study were as follows:

1. What do individuals experience when they engage in self-directed toning, and what effects are they aware of as a result of engaging in toning? How does this compare to singing slow songs?
2. What felt emotions are elicited in individuals when toning and singing slow songs, to what degree, and how do they compare between the two conditions?
3. What are the similarities and differences in the two sets of data (interviews and GEMS questionnaires)?

Materials and Methods

Design

We collected descriptive data about participants' experiences following toning and after a condition where they sang slow songs of their choice. Singing slow songs was included in the study design to provide a reference point, in terms of an activity familiar to participants and for which extensive research already exists. By comparing toning and singing, we aimed to achieve a more precise characterization of the experience of toning.

The mixed methods study described in this article was part of a larger study aimed at investigating the effects of toning, singing, and silent breathing on cardiorespiratory and brain responses (Bernardi, Snow, [Peretz, et al., 2017](#)). In the larger study, toning and singing were followed by two silent breathing conditions, where the pace of respiration was matched to the respiration rate that was spontaneously generated while singing and toning. The inclusion of the two breathing conditions will allow our investigative team to determine whether the effects of toning and singing on the brain and cardiorespiratory system are due to respiratory manipulation alone, or to the combination of a modified breathing pattern with the active vocalization. The size of the overall study necessitated publishing the cardiorespiratory data (Bernardi, Snow, [Peretz, et al., 2017](#)) as a separate manuscript from the electroencephalographic activity data (publication in process). For this manuscript, we were interested in answering questions about participants' experiences of and emotional responses to toning based on our descriptive data.

Measures

Participant Interviews. Interviews started with the four core questions listed below, and because we used a semi-structured format, further questions could be asked if the interviewer wanted more information about a particular response. The focus of the present investigation was the experience and effects of toning. Therefore, the interviews as well as the analyses were restricted to this condition and on the contrast between toning and singing.

Interview Questions:

1. What stands out for you about this experience?
2. What protocol did you enjoy the most? Why?
3. What protocol did you enjoy the least? Why?
4. Please describe your experience with the toning.

Geneva Emotional Music Scale (GEMS-48). The Geneva Emotional Music Scale (GEMS-48) captures the emotions felt by listeners in response to music. This particular survey was chosen because it was developed to address inadequacies in emotion or mood-rating scales that were derived from non-musical areas of research on emotions, and which did not reflect the range and

nuances of emotion evoked by music (Zentner, Grandjean, & Scherer, 2008). Rather than using predetermined emotion labels, the 48-item GEMS questionnaire has been constructed based on the verbal descriptions of emotional states that a large sample of listeners themselves used to describe the feelings evoked by a variety of music. The advantage of this domain-specific instrument is that it provides a richer coverage of the spectrum of emotional states evoked by music, while omitting emotions that are rarely experienced specifically in response to music (e.g., jealousy). For each label, participants were asked to rate how strongly they experienced the corresponding emotion, using a five-point Likert scale.

The following words or phrases are examples from the scale: “calm,” “nervous,” “sorrowful,” “happy,” “feeling of transcendence,” “joyful,” “chills,” and “feel like dancing.” For the purpose of statistical analysis, we referred to the nine-factor model (Zentner, Grandjean, & Scherer, 2008) that grouped different dimensions of emotion into nine categories: Wonder, Transcendence, Power, Tenderness, Nostalgia, Peacefulness, Joyful Activation, Sadness, and Tension. The specific questionnaire items contributing to each of the nine factors are detailed in Table 1.

Participants

Participants were 20 young adults (age, $M \pm SD$: 24.2 ± 3.8 ; 14 female), recruited through flyers posted on two university campuses. Exclusion criteria were experience as a professional musician or singer and any history of epilepsy. Professional musicians or singers were excluded because we wanted to test whether the potential benefits of toning/singing would be available to a general population, and those with epilepsy were excluded because their condition could affect electroencephalographic activity data collection in the parent study. This would result in much wider applicability for the findings.

Ethics

The research design and procedures were approved by the Human Research Ethics Committee at Concordia University (Certification number: 30004786). The project was also approved by the Research Ethics Committee of the Faculty for Arts and Sciences of the University of Montreal. All participants gave written

TABLE 1
Geneva Emotional Music Scale (GEMS-9): Nine Factorial Dimensions of Emotion and Contributing Items

Wonder	Transcendence	Tenderness	Nostalgia	Peacefulness	Power	Joyful Activation	Tension	Sadness
Happy Amazed	Inspired Feeling of Transcendence	In Love Affectionate	Sentimental Dreamy	Calm Relaxed	Energetic Triumphant	Stimulated Joyful	Agitated Nervous	Sad Sorrowful
Dazzled	Feeling of Spirituality Chills	Sensual	Nostalgic	Serene	Fiery	Animated	Tense	Tearful
Allured Moved Filled w/ Wonder Admining In Awe	Fascinated Overwhelmed	Tender Softened-Up	Melancholic	Soothed Meditative	Strong Heroic	Dancing Amused Bouncy	Impatient Irritated	Blue

Source: Zentner, Grandjean, & Scherer (2008).

informed consent to participate in the study. Recruited participants were assigned a research identification number (RIN), which was used to protect participant identity and minimize risk for bias during data analysis.

Procedures

The study took place at the International Laboratory for Brain, Music, and Sound Research (BRAMS), a research center affiliated with McGill University and Université de Montréal in Montréal (Canada). The experimental protocol consisted of four different conditions. The conditions were administered to each study participant in a soundproof booth, with each participant sitting in a comfortable chair facing a screen, throughout the approximately two-hour experiment, with each condition lasting seven minutes. The four conditions were: a) toning; b) singing a slow song using phonetic sounds such as la, la, la; c) silent breathing paced by a visual cue that matched the breathing pattern generated by the participant during condition a; and d) silent breathing paced by a visual cue that matched the breathing pattern generated by participant during condition b. We randomized the presentation order of conditions a) and b) across participants, and replicated this presentation order for conditions c) and d).

Prior to the toning condition, participants received audio-recorded instructions for how to tone. The form of toning used was the expression of open vowel sounds on the full exhalation of the breath, using any pitch. For the singing condition, participants received a list of slow tempo songs to choose from, or they could sing a song of their own choosing that was in a slow tempo, if they preferred. A recorded example of toning, as well as a recorded example of how to sing “Amazing Grace” (one of the songs listed), using the phonetic syllables “la, la, la” was played to each participant before they began the singing protocol. To minimize performance anxiety in participants, they were told that while their vocal responses would be recorded throughout the experiment, researchers present in the control room would not be listening to their live responses.

The GEMS questionnaire was given to each participant immediately after the conditions of toning and singing were completed. A research assistant, blind to the participants’ recorded data

of each condition, but not blind to the nature of the condition, administered the questionnaire to each participant, asking them to complete it in silence.

The qualitative data collection consisted of an interview with each participant immediately following the completion of the four conditions described above. The interview took place in the sound booth where the conditions were administered. The interviewer was a research assistant trained in the method of interviewing. The interviews were recorded and later transcribed by the assistant.

Data Analysis

We used conventional content analysis to analyze participant interview data (Hsieh & Shannon, 2005; Ghetti & Keith, 2016). This consisted of open coding of the data, followed by the development of major categories and subcategories. Due to the complexity and length of the experimental protocol, which resulted in mental and physical fatigue on the part of research participants, we elected to keep the interviews brief, focusing on essential information, with limited follow-up questions. This did influence the length of responses that we received (mean word count: 633 ± 246). A trained research assistant transcribed the interviews and did the initial coding, which was then verified by the first author (SS), who then developed major category and subcategory concepts from this data. A second research assistant, working independently, also developed major categories and subcategories from the coded transcripts. The resulting categories and subcategories generated by SS and the second research assistant were then compared and refined, until agreement was reached on the formulation of major categories and subcategories.

We analyzed the GEMS data to 1) identify emotions participants experienced most strongly in each condition (toning and singing); and 2) determine whether participants experienced emotions differently based on condition (toning versus singing). The GEMS data were rescaled in the range 0–1, to obviate the fact that the nine original factors are not made up of an equal number of items, and as a result each raw GEMS factor has a different range. If a subject had an outlier score (score $>$ or $<$ 2.96 standard deviations from the group mean) in singing or toning for a certain GEMS factor, the score for that participant in that GEMS factor was removed from

both singing and toning (two scores were removed in this way from the analysis of wonder, one from the analysis of transcendence, and one from the analysis of sadness, over a total of 360 scores). The resulting normalized scores were submitted to a linear mixed model analysis, with compound symmetry covariance type and a total of 20 model parameters. Emotion was treated as a nine-level repeated-measures fixed-effects factor (one for each GEMS factor), and condition as a two-level repeated-measures fixed-effects factor (toning vs. singing). Post hoc tests were adjusted using the Bonferroni correction for multiple comparisons. All analyses were performed using IBM SPSS software (version 20).

Data were triangulated by including and comparing both qualitative interviews and the quantitative Geneva Emotional Music Scale (GEMS) questionnaires. Both sets of data provide descriptive information about participants' toning experience. A research assistant systematically compared data obtained from the GEMS questionnaires, with data obtained from the interviews, using the following headings as guidelines: "Similarities and differences," "What stands out for the reviewer," and "Brief conclusions." This analysis was then reviewed and critiqued by the primary author (SS).

Results

Qualitative Interviews

Table 2 presents the major categories and subcategories that emerged from the interview data.

Five major categories emerged from our analysis of participant interviews:

1. Descriptions of the process of toning
2. Sensory experiences
3. Altered states of awareness, attention, and consciousness
4. Affective responses to toning
5. Comparisons of toning to singing

These categories represent five distinct domains of experiencing:

1. Musical: the process of improvisation
2. Physical: the realm of the senses

TABLE 2

Major Categories and Subcategories of the Experience and Effects of Toning

Major Categories	Subcategories
Descriptions of the Process of Toning	Experimenting with pitch and vowel sounds; Challenges encountered
Sensory Experiences	Haptic experiences; Hearing; Visual
Altered States of Awareness, Attention, and Consciousness	Meditative experiences; Transcendence; Awareness of self; Positive affect
Affective Responses to Toning	Positive, negative, and mixed reactions
Comparisons of Toning to Singing	Neutral vs. emotional; Absence of meaning vs. meaning

- 3. Mental: shifts in attention, awareness, consciousness
- 4. Emotional: affective responses
- 5. Cultural: comparing toning to singing; providing a solid reference point; shared meanings with singing

Taken together, these five domains offer preliminary findings concerning the experience and effects of toning. Below is a presentation of the data corresponding to each category. The Discussion section will elucidate these categories in further detail, concerning their importance and clinical relevance.

Category #1: Descriptions of the Process of Toning. This category pertains to data concerning the musical process of vocal improvisation involved in toning. Participants provided detailed descriptions of how they worked with different pitches and vowel sounds, and any challenges they experienced.

Subcategory #1: Exploration of how to engage in toning. Participants' experiments with pitch or vowel sounds were described by 10 out of 20 participants. Trying different pitches by going higher, lower, or trying pitches in the middle range were described. Trying different vowel sounds such as "u," "oo," and "a" were mentioned. Some pitches and vowel sounds, and combinations of particular pitches and particular vowel sounds, appeared to be easier and more comfortable to make than others. One participant mentioned having a few "favorite tones." Another spoke of being able to exhale more

deeply on some tones than others, and he preferred the ones he could “drag out” the longest. One participant noted that a lower tone hurt his voice, and caused him to feel tired. Going up higher felt better to him, as he could hear it better. “Playing” with different pitches and sounds, and being “playful” with them, was also language used to describe the process.

Subcategory #2: Challenges encountered. Four participants spoke of the challenging aspects of engaging in toning. Having to hold the sound for a long time (although no explicit requests about any certain duration for the sound had been made), not feeling that they were doing it as well as they would have liked, not liking how they sounded, and feeling the need to change the pitch (though that was not mandatory) were among the challenges described. Performance anxiety was clearly experienced by a number of participants. Feeling self-conscious or judgmental about one’s voice was indicative of this. In the words of one participant: “The fact that I couldn’t hold a tone or didn’t sound as good as I would want to sound conflicted with my view of who I am...for the most part it was ‘Wow, this is new. I wish I was better at this.’” This same individual was afraid he was being listened to by the researcher, even though it was made clear that he would not be.

Category #2: Sensory Experiences. Participants mentioned experiencing physical sensations and aural and visual sensations while toning.

Subcategory #1: Haptic sensations. Vibrations, resonance, chills, trembling, and tension were all mentioned as physical experiences, with vibrations being mentioned the most often. Specifically, people cited their chest, throat, vocal cords, mouth, and the top of the head as areas where they experienced vibrations. These vibrations were characterized as positive experiences, using language such as “a very pleasurable physical sensation,” “it felt cool,” and “it felt good.” One participant described experiencing tension that was then released, resulting in “feeling relaxed on the inside.” Another described their body “coming more alive.”

Subcategory #2: Aural and visual sensations. Regarding hearing, two participants described hearing overtones: “I noticed different overlays, possibly like harmonies.” Another participant described hearing different octaves while making a sound. Regarding visual experiences, one participant described the following: “Everything

around the screen turned a shade of gray, purple, and blue; not a psychedelic kind of color; more like a really faded color. Maybe with some red in it, but it was a very strong visual sensation.”

Category #3: Altered States of Awareness, Attention, and Consciousness. The language used to describe these experiences was quite varied, and at times was highly specific to the individual. It was also clear that some participants struggled to express their experiences in words. Participants spoke of meditative experiences, pleasurable experiences, being in the present moment, listening to oneself without thinking, and moving beyond oneself.

Subcategory #1: Meditative experiences. This word was used repeatedly by participants in characterizing certain aspects of their experiences. Two participants spoke of their awareness of their voice and the vibrations they felt as meditative. Two participants experienced making low pitches or tones as meditative. A state in which there was an “absence of thinking” was also described by several participants, which is a central feature of meditative states. In the words of one participant: “After a while of making the sounds, my brain went blank and my eyes didn’t focus as well...I lost thought...I forgot that I was still making the sounds.” Another reported that near the end of the toning condition, “I was moving from vowel to vowel, tonality to tonality without thinking.”

Subcategory #2: Transcendence. Going beyond normal “ego” consciousness, and no longer feeling the physical body, or identifying with it, are ways in which participants experienced a sense of transcendence. Here’s a description from one participant: “It just felt like I was outside of just my own body; not an out-of-body experience, but just beyond that whole ‘I’m me.’” Another participant said: “It was as though it wasn’t me that was doing it (toning) at the end.”

Subcategory #3: Awareness of Self. Becoming aware of and listening to the sound of one’s own voice was mentioned by many participants as a salient feature of their experience with toning. Often coupled with this was a focus on feeling the vibrations of the voice in the body. One participant described this in the following way: “When I was doing the (toning) with the sounds that I had to hold for a long time, with no other sound in the room, it was cool to see how much I was listening to my own self.” Another wrote: “I was so focused on my own voice it cleared my mind.”

Subcategory #4: Positive affect. For many, the experience of connecting to one's voice and feeling the vibrations in the body elicited positive feelings. Words such as "pleasurable" or "cool" were used to describe these experiences. For one participant, the experience of "feeling utterly in the present moment" was accompanied by "an intense sense of euphoria and connection too." Another said they felt "in flow" at a certain point, which they found interesting and liked.

Category #4: Affective Responses to Toning. It is clear from the content of the interviews that none of the participants had experienced toning previous to their participation in this study. The most frequently occurring words used to describe their experiences with toning were "interesting," "weird," and "cool." Among those describing it as "interesting," there appeared to be pleasure in discovering something new that they had not encountered. This applied also to those who described it as "cool." Those describing it as "weird" tended to not like it. Just singing vowel sounds seemed to a few people to be strange and something to which they had difficulty relating.

Subcategory #1: Positive experiences of toning. Twelve participants reported a positive response to the toning. Their reasons for liking toning encompassed a wide range of responses. The words participants used to describe why they liked toning included "soothing," "calm," "grounding," "pleasurable physically," "relaxing," "peaceful," and "fun." Some participants mentioned positive associations to toning. Here are some of their statements:

"It was really grounding. I felt more strong and aware, kind of like yoga."

"It's interesting to be in a silent place and hear your voice. It's calming,"

"I liked it because of the strange state I felt. I really felt my conscious brain recede and the colors in the room changed and I stopped really feeling my body. That said, I really also felt the vibration of the sound which I'd never paid attention to before. I could feel the sound waves on my mouth, which was cool."

"The toning was meditative for me because I was listening to my own voice and the vibrations in my body."

“It was just really fun because you could play with the different vowels.”

Subcategory #2: Negative experiences of toning. Six participants reported a negative experience of toning. “Weird,” “strange,” “odd,” “upsetting,” and “difficult” were some of the words used to describe these experiences.

“It was strange (vocalizing) all these vowels that I usually put into words. Isolating them makes them sound odd. It sounds weird just hearing the vowels.”

“Seven minutes of this ‘a, e, o.’ I just found that weird.”

“I felt that I had to hold it out [the sound] as long as possible. And so, it wasn’t as entertaining. It didn’t make me as happy. It just felt like a bit of a chore.”

“It’s just tough to maintain a constant tone.”

One found it “very hard” to breathe in an elongated manner. Another “wanted to be better at it than I was.” A third described feeling “a little lost.” She seemed to experience some performance anxiety—“Even though I’m alone, I feel that I’m still a bit shy about singing out loud”—and reported actually trembling most of the time.

Subcategory #3: Mixed experiences of toning. Two participants reported mixed experiences of toning, with both positive and negative responses reported. One participant reported finding the toning strange, and feeling reserved in the beginning, but then having fun with the process of playing with different sounds. This individual also expressed feeling that it was “intimidating to hear one’s voice in this fashion and having to be confined to a small space,” which was the room in which the participant was located for the research. At the same time, he or she found the toning meditative, and felt vibrations in the throat and chest areas. Another participant found toning to be “interesting” but “wasn’t really lost in it” and found it difficult to maintain a constant pitch.

Category #5: Comparisons of Toning to Singing. Participant comments focused on how their experiences differed during toning and singing:

Subcategory #1: Neutral vs. emotional. This first distinction between toning and singing was described in the following ways by two participants: “The toning was just so much more relaxing,

whereas memories started coming in when I was singing. The toning was very much more neutral.”

“With singing, because there’s lyrics involved, it brings up a lot more emotions, because the words have meanings and we attach those words to certain things. Also, there are certain songs that have been heard in certain contexts that are attached to certain feelings. Emotions can be stirred up when you sing that song. Whereas just toning is producing a sound with your voice, just to produce a sound. To express something. It’s a bit like talking would be.”

Subcategory #2: Meaning vs. absence of meaning. Some participants preferred singing because there was a sense of “meaning” to it, whereas with toning they experienced an absence of “meaning” (keep in mind here that participants were not told what the purpose of toning is). Meaning was ascribed to the fact that songs have lyrics that are talking about something, whereas toning for most people was non-referential. A few people had associations to toning that were meaningful, but most did not.

GEMS Questionnaire Data on Toning versus Singing

The GEMS scores collected following toning and singing are shown in [Figure 1](#). Singing resulted in stronger feelings of tenderness and nostalgia, compared to Emotion by Condition interaction ($F_{(8,314.6)} = 2.2$, $p = 0.024$; post hoc: $p = 0.025$ for tenderness and $p = 0.018$ for nostalgia). A tendency was observed for toning to promote stronger feelings of transcendence, compared to singing, but this effect did not reach statistical significance ($p = 0.086$). When comparing the various emotions with each other, the most striking finding was that in the toning conditions peacefulness prevailed over all the other emotions (all $p < 0.001$). No other between-emotion comparisons were found to be significant for the toning condition after correction for multiple comparisons. The emotional landscape following singing was also dominated by peacefulness (all $p < 0.01$, except for the comparison with nostalgia: $p = 0.4$), followed by nostalgia (scoring higher than Wonder: $p < 0.05$; Transcendence: $p < 0.01$; Power, Sadness, and Tension: $p < 0.001$) and tenderness (scoring higher than Sadness, Tension: $p < 0.05$; Power: $p < 0.01$).

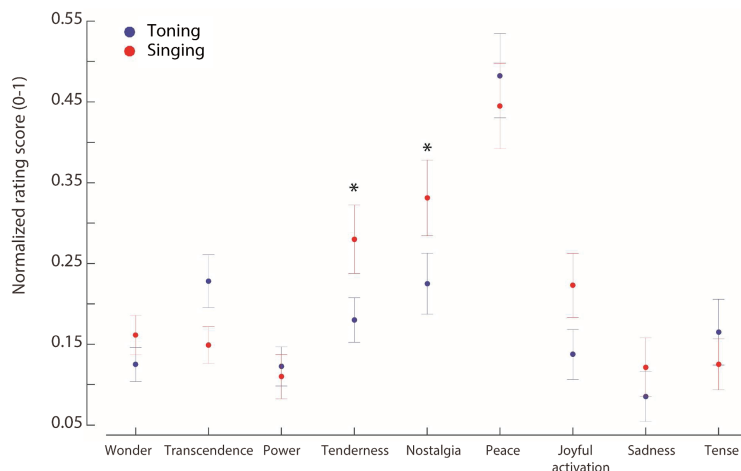


FIGURE 1.

Emotions ratings for toning and singing

Note. Shown are the average ratings (mean \pm standard error) for each of the nine GEMS factors, plotted separately for Toning (blue dots) and Singing (red dots). Asterisks indicate a statistically significant difference between Toning and Singing (* $p < 0.05$).

Beside analyzing the GEMS data statistically, we also looked at the mean averages for highest- and lowest-rated emotions for toning and singing (summarized in Table 3). If we look at the results for toning, all three of the top-rated emotions are quite similar to one another. “Meditative” received the highest rating, followed by “calm” and “relaxed.” Regarding the singing, which we will remind the reader was to a slow song using phonetic sounds such as “la, la, la,” a “calm” emotion was similarly the highest-rated state. The two other top-rated emotions for singing were “mellowed” and “happy.” These differences are also reflected in data from the interviews, in which the act of singing elicited feelings of happiness, joy, and/or excitement in some participants.

Comparing GEMS Questionnaire Data to Interview Data

Overall, the GEMS questionnaire data generally supported the findings from the interview data. Often, the questionnaire data expanded upon the descriptions provided in the interviews. For example, one participant in the interview described the toning as

TABLE 3

Mean Scores: Highest-Rated and Lowest-Rated Emotions from GEMS Questionnaire

Toning			
Highest-Rated (Mean Score)	Meditative (3.25)	Calm (3.05)	Relaxed (3.0)
Lowest-Rated (Mean Score)	Bouncy (1.0)	Dancing (1.1)	In love (1.2)
Singing			
Highest-Rated (Mean Score)	Calm (3.15)	Mellowed (3.0)	Happy (2.9)
Lowest-Rated (Mean Score)	Fiery (1.2)	Impatient (1.2)	Irritated (1.25)

simply having made her feel relaxed, while in the GEMS questionnaire, she indicated having experienced a “feeling of transcendence” and a “feeling of spirituality.” Another participant described hearing the vowels as “a bit weird,” yet gave “calm” the highest rating on the questionnaire. This was a surprise. In fact, most participants who expressed a dislike for toning in the interviews indicated some positive emotional experiences in the questionnaires.

It is of note that almost half of the participants chose the descriptor “feeling of spirituality” in the questionnaires, yet it was mentioned only once in the interviews. Here is a quote from the participant discussing toning who mentions spirituality in their interview: “It’s as if there was a music that came from somewhere else and it had a spellbinding character; it [toning] was the most spiritual of all of them and perhaps the most meditative as well. Because, there was a state for about a second in the sense that I wasn’t really controlling. And I wasn’t reflecting at all at the end. I was moving from vowel to vowel, tonality to tonality, without thinking.”

Discussion

The purpose of this study was to investigate the experience and effects of toning. A key finding was that after just seven minutes of toning, participants reported experiencing altered states of awareness, attention, and consciousness. This finding is noteworthy given that the study involved participants with no previous exposure to toning, thus ruling out bias and some potential for a placebo effect. Some participants were aware of alterations in their

body and senses; for example, “My conscious brain reced[ed] and the colors in the room changed and I stopped feeling my body.” Others described altered states of attention; for example: “I was so focused on my own voice it cleared my mind.” Altered states of consciousness (ASC) were suggested by descriptions such as the following: “[I was] feeling utterly in the present moment with an intense feeling of euphoria and connection.” While it may be difficult to prove ASCs without definitive brain-imaging data, intensely positive feelings such as euphoria and ecstasy, as well as meditative states in which one’s normal thought processes are suspended, are widely recognized as expressions of ASC (Tart, 1972, Shapiro, 2008).

It is of course possible, and perhaps likely, that some descriptions of altered states would not qualify as altered states of consciousness; hence, we use the term “altered states of awareness” to accommodate a range of experiences on this spectrum. Snow (2011) also identified altered states of consciousness occurring among recipients of sound healing in the form of vocal toning. Meditative states experienced by some participants in this study were often described as “spiritual” and involving a “feeling of transcendence.” To this point, the cluster of emotions under the heading of “Peacefulness”—“calm, relaxed, serene, soothed and meditative”—received the highest rating for Toning, and the second highest rating was for “Transcendence”—“inspired,” “feeling of transcendence,” “feeling of spirituality,” “chills,” “fascinated,” “overwhelmed.” Transcendence is defined as “Beyond or above the normal range of human and physical experience” (*Oxford English Dictionary*, 2005) or “Lying beyond the ordinary range of perception” (www.thefreedictionary.com, accessed March 21, 2017).

The sense of non-ordinary experience suggested by this phrase (i.e., lying beyond the ordinary range of perception) corroborates the many descriptions of altered states of awareness, attention, or consciousness experienced during toning from the participant interviews. A tendency for toning to promote stronger feelings of transcendence compared to singing emerged from the GEMS questionnaire, but this difference was not statistically significant. This may be due to the small size of our sample, but may also be due to our choice of the GEMS over other survey instruments. The GEMS questionnaire is a tool designed to capture music-evoked

emotions, which incidentally includes items related to altered states of awareness, attention, or consciousness. The qualitative findings of the current study indicate that future research on toning may usefully employ a different type of survey, specifically designed to capture shifts in awareness and consciousness.

In seeking to understand what attributes of toning could contribute to its success in inducing altered states of awareness, attention, or consciousness, the data on sensory experiences comes into play. Previous research has shown that sensory experiences are often elicited by toning, and can be an important aspect of the experience (Snow, 2011). Descriptions of sensory experiences by participants in the current study indicate that for many, the physical experiences with vibrations were primary in their experience of toning. This would make sense, considering that the embodied voice was the source emitting the vibrations. The vibrations were experienced in different parts of the body, and almost always described as pleasurable. Feeling these embodied vibrations also appeared to lead some participants into deeper states of awareness. Because they were pleasurable, the motivation was there to experience the vibrations fully by focusing on them. This one-pointed focus appears to have encouraged heightened awareness and meditative states in some participants. The sound of one's own voice was also an important focal point of concentration for some participants. In fact, the combined experience of hearing one's voice and simultaneously feeling its vibrations in the body seemed to mesmerize some participants and draw them into a state of heightened awareness and meditative states as they were toning.

Clinically speaking, two important implications from these findings emerge. First, the ability of toning to inspire and foster sustained attention on the felt and "heard" experience of vocalizing opens the door to consideration of this intervention with adults and children diagnosed with attention-deficit disorders like ADD and ADHD. Second, this same ability concerning focus of concentration or attention, as well as the shifts in awareness and consciousness brought about by toning, correlates well with the goals of mindfulness-based meditation interventions that are now widely applied in work with individuals receiving psychotherapy (Shapiro & Carlson, 2009; Pollack, Pedulla, & Siegel, 2016). As such, toning has the potential to be an excellent vehicle for this kind of work by music therapists.

Another finding in this study is that toning can generally be characterized as a more “neutral” form of vocalizing in terms of emotions and meaning than singing slow songs. Singing evoked stronger emotions than toning, and more associations. Data from our interviews suggests that previous positive experiences with singing had an impact on some participants in terms of encouraging feelings of happiness and joy while singing during the experiment. Some participants described their love of singing songs and excitement at the thought of being able to engage in this form of singing during the experiment. Additionally, singing songs with lyrics conveyed meaning and feelings through the content of the lyrics. This is reflected in the GEMs questionnaires, in which singing showed significantly higher scores for the clusters “Nostalgia,” “Tenderness,” and “Joyful Activation” than toning (please refer to [Figure 1](#)).

Furthermore, this difference is reflected in the highest-rated and lowest-rated single emotions (as opposed to clusters) from the GEMs questionnaires, listed in [Table 3](#). For toning, the highest-rated emotions were “meditative,” “calm,” and “relaxed.” For singing slow songs, the highest-rated emotions were “calm,” “melodied,” and “happy.” Both toning and singing slow songs induced feelings of calm, but singing also evoked a “happy” feeling. The fact that participants were able to self-select the slow songs they sang may be a factor in the positive affect that was evoked. Among the lowest-rated emotions for toning was also found “in love,” which can be characterized as a state of intense feeling. It is not, then, that toning does not evoke any feelings, but rather that they tend to be more neutral in character than those evoked by singing slow songs.

Another key piece of data that supports the correlation of toning with generally more neutral emotions like “calm” comes from one of the empirical findings of this mixed methods study. In the analysis of the psychophysiological data, toning was found to slow respiration to almost exactly six breaths/minute ([Bernardi et al., 2017](#)). A decrease in breathing rate compared to baseline was also observed when singing slow songs, with participants breathing about 12 breaths/minute, thus significantly faster than what was observed during toning. Breathing at six breaths/minute is known to optimize cardiovascular function, for example by increasing heart rate variability (HRV). It coincides with the period of

endogenous circulatory rhythms, and has been identified among individuals engaged in rhythmic chanting of yogic mantras (Bernardi et al., 2001). This respiration rate has also been cited as inducing favorable effects psychologically, such as reduced anxiety (Clark & Hirschman, 1990; Koole, 2009). Trauma expert Dr. Bessel van der Kolk has characterized a respiration rate of six breaths/minute as having a significant calming effect on the nervous system (van der Kolk, 2016).

The significant difference in the breathing rates between singing and toning could be a factor in explaining the difference in emotional expression that was experienced between the two. Breathing at a faster rate may correlate with the experience of stronger, more stimulating emotions such as happiness or joy, whereas breathing at the slower rate does not, because of the sedating effect on the entire nervous system. The clinical implications of this finding are that toning's more neutral stance vis-à-vis emotional expression and meaning can render it a safer form of singing for clients who are unable to do emotional work in therapy. For example, adults with schizophrenia or psychotic conditions would be a client population for whom toning may be beneficial. Clients with PTSD would be another group that may benefit from toning. For clients who are resistant to exploring and expressing their emotions, for psychodynamic reasons, toning could be a useful form of musical engagement that is less threatening, utilized while the resistance is being worked through.

Regarding the experience of toning, we found that for many participants, being able to experiment with the pitches and/or vowel sounds was essential to their ability to feel a sense of success with, and enjoyment of, toning. Being able to find a pitch and vowel sound where one's voice feels comfortable and sounds good to the person toning increased their ability to fully engage in and enjoy toning. We know from both singing and toning that the untrained natural voice has many variations in resonance and strength, depending on the pitch and vowel sound or word combination being vocalized. A pitch and sound that are resonant will generally sound better to the ear than a combination that is not. Being able to find pitches that feel comfortable for the voice to express is essential for the health of the voice, and the enjoyment of vocalizing.

This finding should act as an encouragement to music therapists who utilize toning as an intervention, to make sure they allow for an improvisatory process in which clients can experiment with different pitches and sounds to find what feels comfortable and good to them to vocalize. Once they find a pitch-vowel combination they like and that feels good, they are free to stay with that for as long as they like. When working with individuals who are severely ill, either mentally or physically, or who have significant impairments with vocalizing or hearing, for example, it may of course not be possible to engage in a full improvisatory process.

The data also indicates that self-consciousness and performance anxiety were factors affecting some participants, resulting in difficulties with engagement and satisfaction with toning. It would behoove music therapists to keep this fact in mind: even though we tend to think of toning as easier than singing songs, for some clients, the act of engaging in any kind of vocalizing can engender discomfort and anxiety. Also, some participants expressed feeling that they were not very good at toning, that it was new for them, and that they wished they were better at it. If music therapists are prepared for this kind of response, with strategies to help clients overcome these feelings, we can increase clients' capacity for successful engagement with toning.

Another issue to keep in mind is that toning is unfamiliar to most people. The data indicate that negative responses to toning were sometimes linked to participants finding it "weird" or "strange." Not understanding what it "meant" or what it was for resulted in a sense of alienation suggested by the adjectives just mentioned. When appropriate, clear explanations by music therapists of what toning is, and what its purpose is, can help minimize the frequency and impact of these kinds of responses. Introducing toning as a form of vocal musical improvisation may help participants "locate" toning in the more familiar frame of musical improvisation.

Limitations of this Study

This study took place in the artificial environment of a laboratory, with the following constraints: no physical movement, keeping a steady gaze, the necessity to tone alone without another person, and providing minimal background information about the study

conditions experienced. As stated earlier, the qualitative interviews were brief, due to fatigue associated with the testing conditions. This limited the amount of depth and richness of data that could be gathered from this source. However, despite these factors, our findings indicate clear benefits to toning, suggesting substantial strength in our findings.

Conclusion and Recommendations for Future Research

This study significantly expands our understanding of the experience and effects of toning, and provides useful data concerning the emotional responses to both toning and singing slow songs. This new information has direct implications for clinical practice, and can assist clinicians in implementing more effective strategies for engaging clients in toning. Based on our findings concerning altered states of awareness, attention, and consciousness, we recommend that future studies examine toning vs. mindfulness-based meditation, and toning to improve focus of concentration in persons with ADD.

It is also recommended that investigators considering mixed methods studies involving experimental protocols give careful consideration to the timing and conditions under which qualitative measures will be taken. Reflecting on this study, participant fatigue might have been reduced as a factor in the length of the qualitative interviews if a rest period had occurred prior to their administration. Removing participants from the sound booth, unhooking them from monitoring equipment, and conducting the interviews in a more relaxing setting could have potentially benefited the process.

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