

## Project Overview

Spirituality can be considered a requisite for self actualization<sup>1</sup> and entheogens<sup>2</sup> can be considered a requisite for greater connection to spirituality. (Ball, 2006) By using electrentheogens,<sup>3</sup> humans can potentially evolve on an individual and spiritual level. The abundance of mobile communications in the form of cell phones and pocket PCs is making digital connections more available to a cross section of economic and cultural groups<sup>4</sup> expanding connectivity and potentially heightening our ability to explore and understand our desire to connect with the greater whole and is ultimately changing the processes for how we communicate with others and our consciousness.

By examining various world practices and beliefs, and acknowledging their potential contributions to the overall human experience as deriving connectivity thru progressive introspection, and coupling this with ancient uses of sound and color and current trends in the use of binaural beats and experiments in color and motion, this investigation

---

<sup>1</sup> “Even if all these needs [physiological, safety, belonging] are satisfied, we may still often (if not always) expect that a new discontent and restlessness will soon develop, unless the individual is doing what he is fitted for. A musician must make music, an artist must paint, a poet must write, if he is to be ultimately happy. What a man can be, he must be. This need we may call self-actualization.

This term, first coined by Kurt Goldstein...refers to the desire for self-fulfillment, namely, to the tendency for him to become actualized in what he is potentially. This tendency might be phrased as the desire to become more and more what one is, to become everything that one is capable of becoming.” (Maslow, 1943)

<sup>2</sup> Entheogens are substances that generate mystical experiences. Other terms used in different contexts are psychedelic and hallucinogens. An example is peyote used by shaman for spiritual, ritual practices. (Anthology, 2000)

<sup>3</sup> The term is not found in any dictionary but is a combination of the words electromagnetic and entheogen and is the method behind the concept of Digital Divine.

<sup>4</sup> “While more and more people are using the Web, a significant number of people still do not have regular, effective access and ability to use digital technologies. This is known as the “Digital Divide”. An important step in the direction of filling this gap has been the deployment of mobile networks all around the world. For example, as of today, more than 80% of the world’s population is covered by GSM, and more than 2 billion people have access to a mobile phone. With one million additional people newly subscribed every day, it is expected that by the end of 2010, almost 4 billion will have access to a mobile phone.” (W3C, 2008)

expands the current understanding of various rituals and practices of meditation and, or prayer and entheogens and relates them to each other and translates them into digital media. The ultimate goal of this project is to create a free meditation tool for use with computers, DVD players, cell phones and other personal media devices.

## **Production Goals**

The production goals were to create a new media version of ancient mandala<sup>5</sup> and mantra<sup>6</sup> in a functional, aesthetically pleasing audio/visual tool to enhance focus for meditation purposes. The initial concept was to use vibration differences between frequencies of sound and color to alter states of consciousness much like the use of entheogens for spiritual connection and meditative focus. This concept, inspired by contemporary movements in brain wave entrainment<sup>7</sup> is not new, but is a technologically advanced version of what has been part of spiritual ritual throughout history in such practices as Vedic mantras, Gregorian chant and meditative mandalas. The expectation for this project is to produce an altered state of consciousness at least

---

<sup>5</sup> “The word “mandala” is from the classical Indian language of Sanskrit. Loosely translated to mean “circle,” a mandala is far more than a simple shape. It represents wholeness, and can be seen as a model for the organizational structure of life itself—a cosmic diagram that reminds us of our relation to the infinite, the world that extends both beyond and within our bodies and minds.

*Describing both material and non-material realities, the mandala appears in all aspects of life: the celestial circles we call earth, sun, and moon, as well as conceptual circles of friends, family, and community.*

*“The integrated view of the world represented by the mandala, while long embraced by some Eastern religions, has now begun to emerge in Western religious and secular cultures. Awareness of the mandala may have the potential of changing how we see ourselves, our planet, and perhaps even our own life purpose.” (Cunningham, 2002)*

<sup>6</sup> Powerful sacred sounds (chants) linking heaven and earth (Bowker, 2006)

<sup>7</sup> Also referred to as synchronization based on the frequency following response which are “brainwaves modulate in tempo or frequency to gradually match the frequency of a rhythmic stimulus in the environment.” Also called auditory driving (CCRMA, 2006)

in some users likened to psychoactive enhanced meditation or at the very least, the deep sense of focus attained while watching an engrossing movie.<sup>8</sup>

### **Project influences**

Hinduism, Buddhism and Native Religions have influenced many of the ideas relating to this investigation. In particular, the rituals involving mantras and mandalas have had significant power in not only to concept, but the aesthetics of this project. Tibetan monks create intricate sand mandalas then chant "*in deep tones as they sweep their mandala into a jar and empty it into a nearby body of water as a blessing.*" A similar practice is also performed by the American Navajo people. (Cunningham, 2002) This meditative practice is significant in relation to digital media beyond that the process of creating such mandalas takes time, focus and energy. This mandala energy is then released into the cosmos much like the way people today work long hours to create works of art in audio and video and then releases it into the cosmos on YouTube and many other public forums.

The digital, photic and auditory mandala and mantra has been around since the beginning of digital media. It could be said that even the radar screens and sounds of submarines a century ago were consciousness altering<sup>9</sup> precursors to the screen savers, and media player's reactive visualizations that are prevalent today. The

---

<sup>8</sup> "Studies have shown that watching television induces low alpha waves in the human brain. Alpha waves are brainwaves between 8 to 12 HZ. and are commonly associated with relaxed meditative states as well as brain states associated with suggestibility." (Carmichael, 2007)

<sup>9</sup> "In 1959, Dr. William Kroger and Sidney Schneider reported on the unusual effects of the rhythmic flashing of the dot on radar screens of ships and submarines. On several occasions the radar operators readily entered into a relaxed state of mind and others fell into deep hypnotic states while watching signals on the radar screen." (Seiver, 1997)

hypnotic effect of these visualizations is also an influence on this project along with the rhythmic influences of contemporary music, i.e. ambient and electronic music.<sup>10</sup>

Nature also plays a significant role in the overall investigation into the mandala and mantra theme of this project. From the patterns found in ice crystals, spider webs and native plants to the sounds of the wind atop mountain peaks and the rhythmic pulsing of streams and waves, to the melodic calls of birds in treetops, the influence of audio/visual elements found by going outside and away from or even within urban areas inspires the overall concept of meditative stimuli for this project.

## **Production Strategies**

Digital re-creations of many of the sights and sounds of nature were accomplished in this project by using various sound synthesis programs and timeline based media. The initial stages of experimentation focused mainly on the development of binaural and monaural<sup>11</sup> beats using simple sine waves at various frequencies ranging from 90Hz to 440 Hz with a difference ranging between 0.5Hz and 20Hz. The next focus was incorporating additional sounds as more melodic undertones. The initial, more musical pieces were incorporated with the binaural beats, but were discarded due to inconsistencies in beat perceptions both with and without headphones and conflicts with

---

<sup>10</sup> "Music has long been associated with altered states of consciousness. In recent years, the popularity of New Age/ambient and trance music has grown. New Age/ ambient music includes quiet, contemplative music commonly used by individuals for relaxation and meditation. In contrast, trance music is repetitive, rhythmic music often played at dance parties to produce trance states among a group of dancers". Both genres of music are used to produce dissociative, trance-like states, but in different ways." (Becker-Blease, 2004)

<sup>11</sup> The difference between monaural and binaural is the actual "beat" sensation experienced by the subject. Monaural beat is a fused auditory sensation usually experienced while listening to stereo speakers with no physical separation, while the binaural beat is a temporal fluctuation experienced using stereo headphones to separate left from right. (Zeng, Kong, Michalewski, & Starr, 2005)

frequency variations. The more ambient, synthesized sounds representing those found in nature were chosen for their ability to enhance the experience without overpowering the binaural/monaural beat. Digital waves and birds and other re-created sounds were balanced between left and right channels at varying db levels below that of the binaural beat frequencies.<sup>12</sup>

Many of the preliminary color experiments were done with still images created with various illustration programs drawing on the concepts of color as therapy and using the color associations attributed through various sources (mostly alternative)<sup>13</sup> as having particular effects on physiological/psychological function.

- **Red** - stimulates brain wave activity, increases heart rate, respirations and blood pressure, excites sexual glands. It energizes the first chakra (coccyx). It warms us and awakens us physically and energizes our blood. It is a good color to wear when we have colds and poor circulation. Too much red can over stimulate and make some illnesses worse. High blood pressure is an indicator of too much red energy in the body. It is a color for war, prosperity, fire, and rising sun. Spiritually it is the root color of fire and connects us to our physical self.
- **Orange** is the color of joy and wisdom. It affects the second chakra (sacral). It gives an energy, stimulates appetite and it is a good color for illnesses of the colon and digestion. Spiritually it is the color of joy. It connects us to our emotional self.
- **Yellow** is the solar plexus chakra. It energizes, relieves depression, improves memory, stimulates appetite and helps in digestive problems. Spiritually it is the color of wisdom and connects us to our mental self.
- **Green** affects the heart chakra. It has a calming effect and balances the nervous system. Green color is soothing, relaxing mentally as well as physically, helps those suffering from depression, anxiety, nervousness. It is a good color for

---

<sup>12</sup> These types of experiments have been documented by many institutions, but for better understanding of the processes for this project, some simple experiments were performed based on the guidelines established by the Department of Physics and Astronomy at Rutgers State University. (AUDITORY ILLUSIONS & LAB REPORT FORMS)

<sup>13</sup> Many of the sources for information relating to spirituality are not found in science journals and are not considered theoretical as much as it is hypothetical. It is controversial to use unconfirmed information in most scholarly documents, but for the purposes of this project and the concept and context relating to elecetrentheogenic experiences, the intuitive element of observation is as critical as the scientifically corroborated information.

*cardiac conditions, high blood pressure and ulcers. Since green stimulates growth, it should be avoided in cancers and other tumors. Spiritually it is the color of love and connects us to perfect love.*

- **Blue** is the color for the throat chakra. It is a good color in respiratory illness or throat infections. Blue is calming and cooling to our system and hence, a good color to counteract hypertension. Spiritually it is the color of health and connects us to holistic thought.
- **Indigo** is the color for healing of the brow chakra. It is a good color for sinusitis, immunity problems, and all face problems. Too much of this color can cause depression. Spiritually it is the color of intuition and connects us to our unconscious self.
- **Violet** is the color of the crown chakra. It is cleansing, strengthening, and awakening, suppresses appetite, provides a peaceful environment. It affects the skeletal system of the body. It is a good color for improving immunity, cancerous conditions, and arthritis. It also purifies the system and is an excellent color for headaches and migrains. Spiritually it is the color of faith and connects us to our spiritual self. (Association of Alternative Medicine)

## Context

The perceived spaces between realities or “frequency prints” are at the core of this investigation. In digital media, this can be the artifacts and specific anomalies related to specific frequencies such as the audio buzz of over saturated red<sup>14</sup> or the ghost of an image, the persistence of vision, or the frequencies between other frequencies that appear visually and audibly. In humans, this can be the human biological transponders<sup>15</sup> responsible for filtering and perceiving the spaces between measurable realities –vibes. Or it could be Mother Mary in your morning toast or your perceptions of what it means to be.

---

<sup>14</sup> This phenomenon mostly found in television broadcast can also be translated into synesthesia, “a neurologically-based phenomenon in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in a second sensory or cognitive pathway.” (Wikipedia, 2008)

<sup>15</sup> This is a concept from an earlier paper on Biological Channel Surfing: *Exploring the Body Chemical Radio Tuner and the Implications for Digital Web Applications Creating Virtual Consciousness*

*“ALL men by nature desire to know. An indication of this is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. For not only with a view to action, but even when we are not going to do anything, we prefer seeing (one might say) to everything else. The reason is that this, most of all the senses, makes us know and brings to light many differences between things.” (Aristotle, 2007)*

The perceived spaces between sound and color have been part of ritual practice for millennia and even though the computer and digital media did not come on the scene en masse until the last few decades, the use of pixels as with sand mandala and the vibratory nature of nature has been used for a very long time to create the spiritual connection that many contemporaries have re-created with digital media.

*“Hallucinogenic plants such as marijuana, mushrooms, peyote and poppies have been used esoterically for various purposes throughout history. Of course, this use was mostly done under supervision and for a specific purpose. Since these hallucinogens primarily affect the etheric and astral bodies, the individual’s conscious awareness of the altered states is limited. Sound, color, movement and meditation can provide effective alternatives for affecting the etheric and astral bodies, allowing the student to experience deeper and more controlled states of altered consciousness with awareness.” (DeMohan, 1994)*

Some of the current trends in electrentheogens, or digital, spiritual enhancement are through mobile technologies. The quality of consciousness accessible via mobile music, literature and other forms of digital art is expanding with the increased accessibility of

cell phones with internet capabilities. Computer games like *The Journey to Wild Divine* which uses biofeedback as an interface for navigation through a mystical world to gain insight and self control for a spiritually enhancing experience are becoming booming enterprise with new releases for software to go with their biofeedback hardware.

The concept of combining sound and color digitally for a spiritual experience was hard to find examples of two years ago when the first “what ifs” were explored. But now, digital meditation mandalas are everywhere! It’s exploding daily! They are abundant on YouTube and Google video. Binaural beat sites were few and far between then as well, but now are listed in the thousands.

With these technologies are expanded passageways for anonymous worship and experiences of the divine via mobile technologies and Internet. This can also encompass a wide variety of outlets including other digital means of readership and worship like *Beliefnet’s* daily horoscope and religious wisdoms via cell phone that create non-threatening, private access to devotion and meditative practice through interactive, digital means.

The influx of commercial enterprises capitalizing on the desire for spiritual connection such as divination sites like *Tarot.com* where a person can ask questions of the Oracle and for price gain wisdom and answers to their deepest, most personal issues. There are many other sites also selling enhanced mental, physical and spiritual health via brainwave therapies to an increasing number of individuals seeking ways to augment their personal growth and spiritual superiority. The exponential growth of these digital connections is such that it can only be documented with anecdotal accounts because at



least as of today, there are no statistics to relate to the explosion of spirituality and meditation via digital technologies.

Given the current rate of expansion, it is plausible to consider the next step after this project could be the need to look at how and when it reached the tipping point from little to no information to the current point of more information than can be sifted through without the aid of a wiki.<sup>16</sup>

## **Critical**

The range of possibilities for exploration into the realm of spirituality via digital media crosses many academic and practical lines, but there are many questionable sources for information as well. Some of the sources can be classified as alternative or New Age philosophy and pseudoscience, but they often rely on scientific information as the basis for their somewhat avant-garde claims but are not recognized by the scientific community as viable, reliable sources. But, to put it in perspective, much of what we know scientifically today started out as questionable speculation, so why refuse to consider possibilities.<sup>17</sup>

Whether scientifically supported or not, there is something to the idea of intuitive connection and spiritual experience. From an anecdotal perspective, many of the ideas for the initial inquiry leading up to the proposal for this project were unsubstantiated, unconfirmed and unexplored “what ifs” in a notebook from daily conversations and

---

<sup>16</sup>Wiki in this sense is a content management system more than a collaborative information system.

<sup>17</sup>Theoretical physics uses mathematical equations to try to explain everything in the universe, yet there are many contradictory theories and none of them are “provable” and today’s “*physicists accept the atomistic viewpoint that material bodies are at the root composed of identical elementary particles, as well supported by evidence. It is taught in every university in the world. Yet, this theory of physics began amongst the early Greeks as a philosophical, or even mystical, religion without any supporting observational evidence whatsoever.*” (Barrow, 2007)

observations of physical and social environments. After searching for answers to the “what ifs” and exploring the possibilities for some of the concepts related to the idea of electromagnetic entheogens, it was discovered that a lot of what was intuitively thought to be true was indeed the subject of many previously studied concepts and thoughts.

It may be simply explained as pattern recognition<sup>18</sup> and intent. The fact that specific questions were asked may have something to do with the answers found. Many times when something was thought intuitively to be relevant, a simple Internet search of the concept would find books and articles related to or fitting the concept exactly.

Sometimes the terminology needed a little adjustment, but many of the concepts in the “what ifs” were found almost verbatim in books and websites catalyzing the need to rethink the part people play in the universal quest for knowledge and understanding in relation to spirituality.

Just opening the spiritual path with the intent to create a spiritual experience has in some way initiated a spiritual journey whether it was truly accomplished through the tools created or merely by the process of making them. The most important lesson learned through this investigation is that the intent is more important than the tool. It doesn't matter whether you walk thru nature or paint on canvas, or listen to music or watch television or movies or talk with your family and friends. The intent you bring to everything you do is by far the most important element in any endeavor or creation and the possibilities for self actualization thru electrentheogens is based on the intent of the

---

<sup>18</sup> Humans are pattern seeking, storytelling animals. We can find patterns in almost everything, even when they don't necessarily exist. This is such a strong tendency for humans, that when a pattern is not recognizable, we tend to make it recognizable and our creativity lends a hand in this. These patterns we see in our universe, for many people indicate “how our cosmos was designed specifically for us.” (Shermer, 2003)

individual, and the possibility to change the world at least on a personal level is tremendous when the intent is geared toward positive change and forward movement.<sup>19</sup>

This phenomenon of reciprocity,<sup>20</sup> the desire to create, give, receive is manifest in today's digital communities. Although these experiences are based on individual beliefs and circumstances, they are still susceptible to external exploitation via spectral manipulation. This manipulation can come from a variety of places. A good marketing campaign feeds off this spectral manipulation by producing ads that will affect the audience knowing that each person will experience a feeling or thought based on the sounds and images. Those thoughts do not all have to say the exact same thing, but as long as they are within a range of "good" or "bad" the product will benefit from the campaign. Another example of this spectral manipulation includes the "vibe" of a charismatic leader. The energy emitted by a strong personality can sway the audience to believe just about anything. This potential manipulation can also come in the form of resonant media in relation to tuning and filtering of electromagnetic frequencies. By removing the noise, the message or experience is enabled and flows freely from transmitter to receiver allowing for the individual to have their own experience. In relation to the digital meditation mandala and other forms of electrentheogens, it's like a Rorschach test...you see what you want to see in the mandala images and experiences.

This manipulated consciousness is evolving into a sort of spiritual kitsch. People seem to want a quick fix for everything and the use of entheogens has always been a short

---

<sup>19</sup> This can be considered the Law of Attraction and is the subject of some New Age philosophy and the main topic in the film "The Secret" by Rhonda Byrne

<sup>20</sup> Law of attraction states that like things will attract like things.

cut to spiritual awareness. With the advent of digital means of consciousness altering thru binaural beats, photic stimulation and everyday web surfing, the natural state of meditation has turned into marketable meditation. Looking at this from a standpoint of using mobile technologies as a conduit for this digital, divine connection and incorporating a way to track a person's physical response to the experience could have beneficial effects for the participant and a potential for commercial use in various therapeutic environments.

### ***Future Projections***

With the advent of wireless technologies and biofeedback, the potential for cell phones with biofeedback sensors in the casing to track heart rate and oxygen levels for use with meditation programs and other forms of electrentheogens is possible within a few years. Soon, a person will be able to hike to the top of a mountain, sit on a bus or lounge on the couch watching and listening to a meditation tool on the screen of their pocket PC or cell phone and track their real time responses via satellite. In the more distant future, the possibilities of communication and brainwave manipulation via satellite without the use of personal media devices. The potential expansion of divine connection using advancements in technologies like TMS for stimulation and electroencephalography for capturing spiritual responses along with modified versions of radio telescopes as a way to see yourself having a spiritual experience, satellite transmission and receivers and the continuing proliferation of mobile devices and potentials for their mutation into radio receiver/transmitters tuned directly to brainwaves enabling visual and auditory experiences without the need for external apparatus as well as body function monitoring as a reciprocal tool in consciousness management.

## Conclusion

Manipulating visible and audible portions of the spectrum to enhance the spiritual experience is growing in popularity, and the use of plant and chemical entheogens<sup>21</sup> to enhance the ability to connect spiritually dates back to the beginning of man's quest for the answers. (Anthology, 2000) By combining ancient ritual with contemporary media as an alternate conduit for spiritual connection, this project joins an accelerated movement in contemporary thought and practice. By combining this spiritual tool with biofeedback, it could have potential benefits in many areas of study including behavior therapies.

The key to this investigation and manipulation is in the frequency prints of digital media, i.e. binaural beats and phi phenomena etc... These perceived images and sounds may be related to the birth place of superstition and religion and are related to human frequency prints and potentially where digital spirituality exists. This isn't about the dogmatic search for a church or the religious containment of belief and behavior. This is more about the collective tendency for humans to seek out and establish a relationship with a higher power or entity. In the age of computers, Internet and mobile forms of digital media, the expansion of potential passageways to divine experience has increased, potentially creating new possibilities for spirituality, and made accessible a personal and individual digital, spiritual connection.

*"It seemed to me a superlative thing – to know the explanation of everything, why it comes to be, why it perishes, why it is". – Socrates*

---

<sup>21</sup> Entheogens are substances that generate mystical experiences. Other terms used in different contexts are psychedelic and hallucinogens. An example is peyote used by shaman for spiritual, ritual practices. (Anthology, 2000)

## Bibliography

Anthology. (2000). *Entheogens and the Future of Religion* (Vol. 2). (R. Forte, Ed.) San Francisco, CA, USA: Council on Spiritual Practices.

Aristotle. (2007, April 11). *Metaphysics, by Aristotle; translated by W. D. Ross.* (T. b. W.D.Ross, Ed.) Retrieved May 4, 2008, from ebooks@Adelaide:  
<http://ebooks.adelaide.edu.au/a/aristotle/metaphysics/complete.html>

Association of Alternative Medicine. (n.d.). *Color Therapy*. Retrieved April 28, 2008, from Biopulse:  
<http://www.biopulse.org/color.html>

*AUDITORY ILLUSIONS & LAB REPORT FORMS.* (n.d.). Retrieved May 4, 2008, from Rutgers Physics and Astronomy: <http://www.physics.rutgers.edu/~jackph/2005s/PS09.pdf>

Ball, M. W. (2006). *Mushroom Wisdom: How Shamans Cultivate Spiritual Consciousness.* (B. A. Potter, Ed.) Oakland, CA, USA: Ronin Publishing, Inc.

Ball, M. W. (2006). *Mushroom Wsdom: How Shamans Cultivate Spiritual Consciousness.* (B. A. Potter, Ed.) Oakland, CA, USA: Ronin Publishing, Inc.

Barrow, J. D. (2007). *New Theories of Everything: the quest for ultimate explanation.* New York, NY, USA: Oxford University Press.

Becker-Blease, K. A. (2004). Dissociative States Through New Age and Electronic Trance Music. (L. D. Butler, Ed.) *Journal of Trauma and dissociation* , 5 (2), 89.

Bowker, J. (2006). *World Religions: The great faiths explored & explained* (First ed.). New York, NY, USA: DK Publishing, Inc.

Carmichael, C. M. (2007, May 17). *Your Brain Waves Change When You Watch TV -Low Alpha Waves Can Lead to "Mind Fog" - Associated Content.* Retrieved May 3, 2008, from Associated Content:  
[http://www.associatedcontent.com/article/247802/your\\_brain\\_waves\\_change\\_when\\_you\\_watch.html](http://www.associatedcontent.com/article/247802/your_brain_waves_change_when_you_watch.html)

CCRMA, S. U. (2006). *Brainwave Entrainment to External Rhythmic Stimuli: Interdisciplinary Research and Clinical Perspectives.* Retrieved May 3, 2008, from Stanford.edu:  
<http://sica.stanford.edu/events/brainwaves/index.html>

Cunningham, B. (2002). *Mandala: Journey to the Center.* New York, NY, USA: DK Publishing, Inc.

DeMohan, E. (. (1994). *The Harmonics of Sound, Color and Vibration: A System for Self-Awareness and Soul Evolution.* Marina del Ray, CA, USA: DeVorss & Company.

Maslow, A. H. (1943). A Theory of Human Motivation. *Psychological Review* (50), 370-396.

Medicine, A. o. (1996-2008). *Color Therapy*. Retrieved May 4, 2008, from BioPulse.org:  
<http://www.biopulse.org/color.html>

Seiver, D. C. (1997). Retrieved May 4, 2008, from Mind-Machines: <http://www.mind-machines.de/downloads/MindAlive/Sonstiges/ch6.pdf>

Shermer, M. (2003). *How We Believe: Science, Skepticism, and the Search for God* (2nd ed.). New York, NY, USA: Owl Books Henry Holt and Company, LLC.

W3C. (2008, January). *The Mobile Web in Developing Countries: Next Steps*. Retrieved April 29, 2008, from W3C Mobile Web Initiative: [http://www.w3.org/2006/12/digital\\_divide/public.html](http://www.w3.org/2006/12/digital_divide/public.html)

Wikipedia. (2008). *Synesthesia*. Retrieved May 4, 2008, from Wikipedia: <http://en.wikipedia.org/wiki/Synesthesia>

Zeng, F.-G., Kong, Y.-Y., Michalewski, H. J., & Starr, A. (2005). Perceptual Consequences of Disrupted Auditory Nerve Activity . *Journal of Neurophysiology* , 93, 3050-3063.