Music and the Brain in Recovery

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What we want to do today

- Learn a little about the brain, (not too much).
- See how music effects the brain and changes the brain in Therapy/Recovery.
- See how music can be used in a treatment setting.
- Sing together!
Here's what I know...

The Brain

What we used to think

New Evidence

- Many of these areas appear to be linked to reward and motivation, emotion and arousal and are also activated in other pleasurable situations.
- All these parts of the brain are activated and known to be involved in both music related emotions, as well as rhythmic timing.

In other words contrary to older beliefs, the whole brain is stimulated, not just certain auditory receptors in the brain.

And the brain is elastic - it can change!
What parts are affected?

- Emotions induced by music activate similar frontal brain regions compared to emotions elicited by other stimuli.
- Joyful and happy musical segments were associated with increases in left frontal EEG activity.
- Fearful and sad musical segments were associated with increases in right frontal EEG activity.

Additionally, the intensity of emotions was differentiated by the pattern of overall frontal EEG activity. Overall frontal region activity increased as affective musical stimuli became more intense.

The link to Tonality

When unpleasant melodies are played, the posterior cingulate cortex activates, which indicates a sense of conflict or emotional pain.

The right hemisphere has also been found to be correlated with emotion, which can also activate areas in the cingulate in times of emotional pain, specifically social rejection.

The link to Tonality

This evidence, along with observations, has led many musical theorists, philosophers and neuroscientists to link emotion with tonality.

This seems almost obvious because the tones in music seem like a characterization of the tones in human speech, which indicate emotional content. The vowels in the phonemes of a song are elongated for a dramatic effect, and it seems as though musical tones are simply exaggerations of the normal verbal tonality.
The Science – “Oh boy”

Neuroscientists are only just beginning to understand how music affects the brain. We know that music is extremely powerful and that it can elicit hundreds of shades of emotion very quickly.

The Brain Knows! “Like a Child.”

Demonstration of how the brain predicts music!
- Our brains expect certain melodic, harmonic and rhythmic eventualities!
- This is a great demonstration of that!
- Pentatonic scale
- Blues scale
- Gospel music
- New Age music
- Meditation music

What people say...

❖ “Music is playing inside my head, over and over and over again, my friend, there’s no end to the music ...”
  ➢ Carole King

❖ “I know it’s only rock ’n’ roll but I like it, like it, yes I do ...”
  ➢ The Rolling Stones

❖ “ ‘Cause music’s been my therapy, taking the pain from all my anatomy ...”
  ➢ Marvin Gaye

Creating Music

1. Play an instrument.
2. Make simple movements, such as tapping a drumstick, along with music.
3. Join a chorus or choir.
4. Even if you’re not musical, have a jam session with friends.
Listening

Although many people listen casually, it may be helpful to be more thoughtful about the types of music one chooses and to be more attentive to them. Especially in recovery, we all know about triggers. What about triggering good things? What about triggering therapeutic responses?

The Brain and Music

Now we’re talkin’!

Music is also stimulates the brain in a positive, energizing, endorphin-producing way!

Hooray!

The Brain and Music

Music is power!

Music may be capable of accessing diverse brain regions in an individualized way.

- **Stress**
  - Emotional problems such as anxiety and sadness, and difficulties with self-esteem, self-acceptance and coping.
- **Thinking**
  - Cognitive issues, including problems with memory, speech, or communication.
- **Pain**
  - Weakness, poor coordination and walking difficulties.
Music was first

Music may be capable of accessing diverse brain regions in an individualized way.

The widespread activity in the brain that music arouses suggests that music serves a critical role in human existence.

Some have proposed that music actually preceded language in human evolution, thus making it a core characteristic or instinct.

Music promotes social bonding and cognitive development.

The Brain and Music

Music as natural medicine

It is thought that music may act as a sort of tonic or jump-starter to activate or improve neurological function.

Music may be capable of accessing diverse brain regions in an individualized way.

Songwriting: Individual Sessions

MI- Stages of Change

I am an alcoholic/addict...
This is who I am...
These are things I lost...
These are things I want back...
This is how I must change...
Write about it.. Sing about it..
Music and the Brain in Recovery

Music Training Influences Multiple Senses

A second study presented at Neuroscience 2013 hints that musical training improves the ability of the nervous system to integrate information from multiple senses.

"Implications of these results are clearly in the rehabilitation field," Julie Roy, graduate student in speech pathology and audiology at the University of Montreal, Quebec, Canada, told Medscape Medical News.

Prior research on the sensory impact of musical training has focused on audiovisual processing, she explained. Her study, she said, suggests a broader role for musical training in improving the ability of the nervous system to integrate information from all senses.

To gauge how musical training may affect multisensory processing, the researchers administered 2 tasks that simultaneously engage the sense of touch and hearing to a group of highly trained musicians and a group of non-musicians.

Test results showed that musicians and non-musicians had identical capabilities to detect and discriminate information based on a single sense, but the musicians were better able to separate auditory and tactile information. This finding suggests that long-term musical training influences multisensory processing, the researchers say.

"By finding that even though using different modalities and nonmusical stimuli, musicians still seem to have enhanced multisensory processing, we are one big step further down the road in affirming that musicians have overall enhanced multisensory processing," Roy told Medscape Medical News.

"We live in a multisensory environment where auditory and tactile information are processed together to give us the perception of the world as we know it. Knowing that musical training can indeed enhance this processing is of crucial importance when speaking about people with disability in one or both of those modalities, but even with people recovering from a stroke, for example, or diagnosed with a degenerating disease, or again, simply aging," she noted.

The study was supported by the Quebec Health Research Fund and the National Sciences and Engineering Research Council of Canada.
A third study presented at the conference sheds light on the neural basis of musical creativity. The researchers used functional MRI to study neural correlates of musical improvisation in 39 professional pianists with varying degrees of improvisational training.

Ana Pinho, MS, from the Karolinska Institutet, Stockholm, Sweden, and colleagues found that experienced improvisers showed increased functional connectivity with other motor, premotor, and prefrontal regions, after adjustment for age and general piano playing.

Many of these areas appear to be linked to reward and motivation, emotion and arousal and are also activated in other pleasurable situations. All these parts of the brain are activated, and known to be involved in both music related emotions, as well as rhythmic timing. In other words contrary to older beliefs, the whole brain is stimulated, not just certain auditory receptors in the brain.

Musical Improv Strengthens Brain Circuits

Emotions induced by music activate similar frontal brain regions compared to emotions elicited by other stimuli. Joyful and happy musical segments were associated with increases in righthand frontal EEG activity whereas fearful and sad musical segments were associated with increases in right frontal EEG activity. Additionally, the intensity of emotions was differentiated by the pattern of overall frontal EEG activity. Overall frontal region activity increased as affective musical stimuli became more intense.

"All this science makes sense when we can see it and feel it. I've seen it happen on a daily basis in Recovery Settings. Days when recovering people laugh, cry, sing and dance all in one day. I firmly believe that music and spirituality are connected, and that perhaps the "God experience" happens as much in our brain as it does in our "heart and soul." John McAndrew

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"The findings support that improvisation training has specific effects on neural networks involved in musical creativity. Extensive experience with improvisation is associated with lower levels of activity in frontal and parietal association areas, regions which are central for cognitive control, working memory, and explicit response selection, suggesting that generation of meaningful musical materials can be more automated or performed with less attentional effort," they explain in a meeting abstract.

"This study raises interesting questions for future research, including how and to what extent creative behaviors can be learned and automated," Pinho added in a statement.

The study was supported by the Swedish Research Council, Sven and Dagmar Salén Foundation, and Fundação para a Ciência e a Tecnologia. Neuroscience 2013. Abstracts 530.13, 122.13, and 767.07. Presented November 11, 2013.
There is excitement in the air because it's Wednesday afternoon at Cumberland Heights in Nashville, TN. I get to go there once a month and do a presentation called "Spiritual Emphasis Day." There are musical instruments up on the stage as well as my own piano and guitar. There will be stories told today, and songs played, and of course some other wonderful things happening. There is buzz about the patients playing later today. They will have a chance to play, sing, make poetry, tell jokes, laugh, cry, and love one another; it's kind of a "Recovery Talent Show."

It all sounds like fun and games, but something spiritual and magical happens every time!

Music and the Creative Arts in general, do something very powerful to all people, but especially to those in recovery. And when they get up in front of a crowd and reach out to them and the audience reaches back, something special happens. This is a chance for them to play for others and to stand with their friends and recover together; fears are often overcome, and dreams come true all in a few minutes.

So what is really happening?

### "Spiritual Emphasis Day"

- **8 Stories and Songs**
- **8 Experiences in Recovery**

Being able to see things differently, experience them with new eyes - with hope, willingness, honesty and open mindedness.

The Song:

"Give Me New Eyes"
Not Being Perfect

- Being comfortable in our own skin, finding acceptance and being ourselves.

The Song:
“Good Enough”

Experiencing a Higher Power

- Seeing a sermon rather than listening to one! Watching God work in others. Using song to describe those experiences.

The Song:
“God Works That Way”

Understanding Our Brokenness

- The miracle of forgiveness.
- Coming from alcoholic family – a song about my father, not feeling loved, understanding those who hurt me, understanding myself and why I hurt others.

The Song:
“If You Can’t Forgive”
### Community

- Belonging to a fellowship, coming home to family, being "a part of", not alone, recovering with others.

**The Song:**

**“The Thread”**

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### Spirituality

- Daily reading; putting new information into our hearts and minds; praying; faith.
- Living with the "windows open"; feeling safe and loved; allowing God into our lives. The miracle of transformation.
- Moving from Pain to Grace.

**The Song:**

**“God Found Us At The Bottom”**

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### Learning

- We will always make mistakes, but we can find new ways to see. We will never be perfect, but there are new miracles every day.
- Like a child, we are always learning.

**The Song:**

**“Like a Child”**
Passing it On

We are all special and have value beyond words. The lesson we can pass on to our children is letting them see us love one another today. This is the hope for our future.

The Song:

“Like We Were Made of Gold”

Questions?

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All songs-stories/videos available for free download at:

www.inthishour.org

www.johnmcandrew.com

www.edkeane.com

Music on all digital platforms including: Apple Music, Spotify, Amazon Music, Pandora.

Thank You
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