

VOCAL IMPROVISATION – A COGNITIVE AND A PSYCHOLOGICAL PROCESS

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SUMMARY. The purpose of this article is to compare the neurophysiological processes of the brain during vocal improvisation and the psychological implications of a spontaneous composition of melody. By taking command of the present, while at the same time bringing forward to the audience an extensive amount of musical knowledge and specific vocal techniques, vocal improvisation is an extensive field of interest for jazz singers and jazz voice educators alike, and its distinct processes are yet to be fully understood and explained. In my years of studying and practicing vocal improvisation, I have sought to understand the balance between these two components – the cognitive and the psychological coordinates of the vocal improvisation and the implications of these coordinates on our everyday life, outside the performing arts frame. The reasons why a singer makes certain musical choices when creating spontaneously, while avoiding others, together with the reasons why improvisation is important in our everyday lives, these reasons make the object of this study.

Keywords: vocal improvisation, spontaneous creation, psychological process

1. Introduction

Creativity is the driving force that ensures human evolution and the key element in every art, but its specifics and its dynamic are still a subject of research and wonder. Improvisation is a form of creativity that is even

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more intriguing and thus more obscure, because it implies spontaneity in creativeness, a field almost unexplored, due to its densely unidentifiable silver lining.

Recent research and experiments on trained jazz musicians have revealed that during improvisation, the brain of the jazz musician is surprisingly deactivating certain portions of the cortex, while activations occur in the sensory areas of the cortex, at the same time attenuating activity in limbic and paralimbic areas.

According to a study on spontaneity and creativity that took place at the Johns Hopkins University that used MRI to understand the brain processes during improvisation, with the help of six highly proficient jazz musicians as volunteers, scientists have concluded that *“the dissociation of activity in medial and lateral prefrontal cortices is attributable to the experimentally constant feature of improvisation and may be a defining characteristic of spontaneous musical creativity”*.³

Improvisation is an important feature of the human brain, with implications outside the music spectrum, one of the main tools in human evolution, that facilitates adapting to environmental changes, helps us to solving problems and communicating actively using tools of improvised speech.

Vocal improvisation is a jazz singer’s tool that takes human evolution even further because it also involves the physiological coordinate of the brain control, besides cognition and creativity.

The importance of these implications makes this study on vocal improvisation and its processes a matter of interest.

2. Discussion

During the extensive study performed by the researchers at the Johns Hopkins Institute, scans of the brains performed on musicians while improvising revealed that certain areas of the brain slowed down in activity, while others increased. The intriguing discovery showed that the front of the brain that extends to the sides, the part of the brain responsible with self-censoring and planning actions, slowed down, while the center of the frontal lobe, the part of the brain that controls self-expression and individuality, showed an increase in activity. In simple words, an improvisation could be defined as the most uncensored expression of the self, in spontaneously created music.

³ Limb CJ, Braun AR, *Neural Substrates of Spontaneous Musical Performance: An fMRI Study of Jazz Improvisation*, February 2008.

While this research is immensely important to neuroscience and music science alike, the study was performed on six professional right-handed jazz pianists, a very specific study group, that did not include other types of instrument performances or vocal improvisations. Had it been performed on vocalists, the physiological aspect of the research would have been included, as well, along with the cognitive and psychological study directions.

The voice is the first musical instrument, and the vocal improvisation is a neurophysiological and cognitive process, with a psychological component as well. The improvised melody of the singer is the response to other musicians' ideas, the audiences' spontaneous reactions, as well as resonant response to their own body and emotions.

The physical mechanisms during an improvised vocal performance include eyes closing, voluntary and involuntary movement of the arms, swinging of the body, among other gestures specific to each individual.

During an improvised "scat", jazz singers often close their eyes, for several reasons:

- **To numb one of the senses, gaining focus and better control on the hearing.** This facilitates better interplay with the band members, the singer thus immersing himself in the performance and blocking away the visual stimuli or the distracting image of the audience. Numbing the visual sense increases hearing attention because it also involves blocking away distracting imagery, those details in the environment that could potentially alter the vision in the mind of the singer, may those details be visual, or even smells, interactions between members of the audience, any specific details that could create a different flow in the musical vision.
- **To access memories and ground the performance in a precise remembered moment.** This gives the improvisation higher emotional support and thus, the phrasing of the melody is more colorful and meaningful. Often, personal memories are difficult to evoke, to express verbally, but scat singing is the perfect tool to speak words in an encoded manner, to use unintelligible syllables to express deep emotions, to root the melody in a memory and ground the scat in an emotion.
- **As a voluntary choreographed act, with the purpose of inflicting emotions upon an audience.** This is, indeed, a matter of stage presence, but it also enters the realm of vocal improvisation's cognitive processes. Just like an actor, a singer's performance must be wisely staged and carefully designed to seduce the audience, to make

them a part of the performance. Closing the eyes doesn't shut away the connection with the audience, but instead, the process encourages the audience to close their eyes as well, to pay more attention to the sounds, than to the visual aspect of the performance.

When a singer's eyes are closed while improvising, the body doesn't necessarily stop from moving. A state of self-dissociation overlapping self-immersing leads to certain body movements that make a singer look like they are in a trance. Their body swings, hands are moving in the air and their face expression seems uncontrolled and the deep level of embodiment makes the singer look almost as though they are flowing.

Every improvisation is unique, even if it can be assembled from the same music quotes collection, from the same universal jazz vocabulary. Each improviser has their unique set of licks and patterns, scales, and intervals, that they opt for instantaneously, spontaneously.

Two improvisations can never be the same, if they are spontaneous, although the use of similar phrases may occur, when two musicians improvise together, if the communication between them is at a very high level of musical empathy and the musicianship of both instrumentalists is based on communion. In this case, the effect of the mutual improvisation upon the audience and the performance itself is only increasing the ethos of the performance.

On a fixed chord progression, limitless options for melody exist, but an improvisation is more than just melody. In the study mentioned above, a number of musicians within the study group were asked to perform a melody after hearing it first, while other musicians within the study group were asked to improvise spontaneously.

Reproducing parts of personal improvisations or other musicians' improvisation in a common practice in jazz improvisation, quoting and paraphrasing is a part of the jazz musician's routine. But spontaneous improvisation, although it can also include quoting, is a spontaneous musical expression of the present emotions a musician feels, while repeating a previously played or sung idea is very much like playing classical music. One already knows all or most of the notes, only adding emotion, whereas the other is spontaneously creating a never before heard music construction.

Here are the two improvisations, one with some general idea about the melody that is to be played, a controlled improvisation, to the left of the image, and the other one, completely spontaneous, on the right side of the image:

E.g. 1

ScaleCtrl



JazzCtrl



Controlled improvisation of a scale, controlled improvisation on a 12-bar blues

E.g. 2

ScaleImprov (example)



JazzImprov (example)



Spontaneous improvised scale, spontaneous improvisation on a 12-bar blues⁴

⁴ Limb CJ, Braun AR (2008) *Neural Substrates of Spontaneous Musical Performance: An fMRI Study of Jazz Improvisation*.

We can easily notice the rhythmic complexity of the spontaneous improvisation, as well as the interesting choice of intervals used, when we are playing a simple C major scale.

A previously heard melody doesn't allow the brain to detach from the cognitive process, but instead uses the portions of the brain dedicated to control tasks. These pictures allow us to clearly notice the rhythmic component of the spontaneous performance, as well as the dynamic of the intervals chosen when improvising.

We can thus understand that spontaneity brings about complexity, a more interesting choice of intervals, on melody, of rhythm, almost like avoiding the simplicity or the formal playing.

Improvisation can be spontaneous or rehearsed, but different from a jazz musician to another, always.

A simple chord progression can offer various options for the improvising musician to tackle. The difference between improvisations is the technical difficulty and the emotional charge they carry. On a simple II-V-I chord progression, limitless options exist, for the improvising musician to tackle. Let's look at this II-V-I progression in Bb major:

E.g. 3



First four bars of a simple II-V-I progression in Bb major

Charlie Parker, one of the most important figures in jazz history, did the following solo on these three chords:

E.g. 4



Charlie Parker's solo on "Confirmation", bars 16-20

Because Charlie Parker is probably the most important figure in jazz improvisation history⁵, who not only created some of the most difficult and surprising improvisations, but also wrote a large number of compositions that

⁵ Carl Woideck, *Charlie Parker: His Music and Life* (Anne Arbor: The University of Michigan Press, 1996), 110.

became jazz standards and defined an entire genre, the bop (or bebop)⁶, it is imperative that some insight be sought on this amazing jazz musician and composer, to understand the music patterns in jazz improvisation.

3. Jazz improvisation, a spontaneous creation

The ability to improvise derives from intense study and technique, and any jazz musician should start practicing scales on simple chord progressions, first.

If we listen to jazz music's highest-level improvisers, Charlie Parker should be the role model for any aspiring jazz improviser.

Charles Parker Jr. (August 29, 1920 – March 12, 1955), known as "Bird", was a saxophone player and a jazz composer, whose influence on the bebop and bop music was paramount. His virtuosity and highly advanced technique still is one of the most influential presences among jazz musicians throughout the world.

Every singer should transcribe and sing as many versions of improvisations on the same jazz standard as possible, for each of them offers different solutions, different solving ideas for various music situations, for various interval options. Starting with Charlie Parker's improvisations should be the logical way to begin learning the jazz improvisation strategy, philosophy, and technique, for any jazz musician, regardless of their instrument.

Just like Charlie Parker is one of the most important improvising jazz instrumentalists, Ella Fitzgerald is one of the most important improvising jazz singers of all time, her instrument-like scat singing proving vocal technical proficiency as well as dynamic, vocal flow and a very personal timbre.

Here is the transcript of the first five bars of her improvisation on All of me, in the key to Bb Major, as recorded in 1962, on the album "Ella Swings Gently with Nelson":

E.g. 5



All of Me, Ella Fitzgerald solo, 1962, bars 1-5

As we notice, Ella Fitzgerald starts on the 3rd of the chord, and comes back to the fundamental, fixing the first pattern in the phrase, which is a pretty common practice in her vocal improvisations.

⁶ Ross Russell, *Bird Lives! The High Life and Times of Charlie (Yardbird) Parker*, New York: Charterhouse, 1973.

When an improvisation starts with a good melodic pattern or lick, the improviser will remember that melody and will repeat it almost the same, every time they play that jazz standard, as a set off for the improvisation.

Let's look at the first bars in the scat on "Take the A Train", from the collaboration with Duke Ellington orchestra, one improvisation that began with the same notes on the first four bars, in 1957 (on the album recorded with Duke Ellington – "Ella Fitzgerald Sings the Duke Ellington Songbook"), as in 1965 (live at the Crescendo in Copenhagen):

E.g. 6



Take the A Train – Ella Fitzgerald's solo, 1957, bars 1-4

Ella Fitzgerald kept the same ideas in her improvisation in different interpretations, just like Charlie Parker did, because it was a good composition, the first time it was improvised. It doesn't take away from the spontaneity throughout the improvisation, but it does change the paradigm of improvisation. While it is still a strong jazz scat, the spontaneity of the composition isn't as strong as it would be, had it been completely start anew.

4. Spontaneity in jazz improvisation

The study routine and the regular practice of scales, licks, patterns, intervals, and arpeggios, as well as the phrasing, rhythm, the swing feel, the straight and the laid-back feel, these are all aspects that make an improvisation a stronger vessel for the musical and emotional message towards the audience. However, over-learning scales and patterns doesn't ensure a genuinely improvised chorus. And it doesn't stand for spontaneous musical creativity.

There is an underlying question in the previous paragraph: how does an improvising jazz singer keep a steady study routine, while avoiding repeating oneself in melody and phrasing? How does one avoid the pattern clichés, while continuing to improve in licks and scales?

I believe the answer is in the quality of the performance and the progress of the spontaneity.

Spontaneity is relevant not only to the significance of the performance, to its effect upon the audience, but it is also important to observe the perception of spontaneity in human behavior³. The sensitivity to spontaneity

may help us judge someone's behavior towards us, may help us assess and decide, much like a musician assesses and decides when they choose certain notes for the improvised melody and leave aside others. An improvising singer may choose to hit notes that are meant to impress by their pitch, their strength, their color, their phonation, their relationship with the previous and succeeding note. Everyone makes their own choices, as much as we make our own choices in everyday life. Prior experience helps us make those decisions, as well as the sensitivity to spontaneity.

Spontaneity can be nurtured by continuously practicing, much like with the practice of speech, because the richer the vocabulary, the more impactful the spontaneity.

A singer's scat singing vocabulary consists of interesting intervals, interesting choice of syllables, personal touches in consonants and vowels, good timing and rhythm, body reactions and facial expressions. All these components can be studied, and should be studied intensely, to master control and proficiency in a personal and inspired improvisation.

The physiological component of the vocal improvisation is paramount to the effect upon the audience. The facial expression of a singer allows the audience to identify the emotions behind the melody and connects the melody to its coded meaning. The reference to the original melody is not important, which means that the emotions behind the lyrics in the melody are not an object of this analysis, because the vocal improvisation within a song can be completely different in style, phrasing, intention, and rhythm. It is important, however, to know the facial reactions and the facial expressions during performance, so a continuous practice of self-analysis and studying of video recorded live performances is crucial to self-development of a singer.

Facial expressions depend on the intended emotion, and they emphasize the emotional message, but also influence how the audience perceives music, because every facial expression accompanying a music text gives it closure⁷. Completing the message, facial expressions are necessary for a substantiated vocal improvisation.

5. Conclusion

Every improvising experience we live, whether it's a musical experience or not, improves our identity and our relationship with the surrounding environment. By improvising, we evolve as human beings.

⁷ Annerose Engel, Peter Keller, *The perception of musical spontaneity in improvised and imitated jazz performances*, *Frontiers in Psychology*, 2011.

Vocal improvisation is the first form of human speech, the primal root of verbal expression and the most exploratory form of creative singing. Through vocal improvisation, a singer becomes an instrumentalist and an active composer, a spontaneous creator of music content. From previous research on spontaneous improvisation, we can conclude that jazz is an individualistic art form, an introspective and a daydreaming practice that can apply to daily attributes of human interactions, such as deciding the flow of words in a specific conversation or talking about oneself. Vocal improvisation is the musical portrayal of the self, a melodious expression of the inner most hidden emotions. Through vocal improvisation, a singer explores the potential of the voice and aims to achieve and overcome that potential. While portions of the cortex slowdown in activity and other portions activate, the body of the singer has the capability of moving the music from the outside inwards and vice-versa, in a cohesive and spontaneous form of art, the art of improvised singing.

Vocal improvisation cannot happen in the absence of a prolonged study of harmonic structure, patterns, licks, and transpositions, it's a long process of learning and understanding music, before spontaneously creating your own. A singer who improvises is a spontaneous composer, so all the rigor and the requirements we expect a composer to meet, are also expected from a singer as well. A good vocal improvisation can mesmerize the audience, as well as satisfy the singer who performed it, and the musicians playing next to them on stage. In the absence of lyrics, a good improvisation can take the audience to peaks of imagination, can drive the thought to wonderous places, even if, in the mind of the singer, simple situations might be the cause of interesting intervals, licks and musical choices.

When asked about what he is thinking of while improvising, Bobby McFerrin responded: "I sing about how my day begins, I get up about 6, read, get the kids up, make breakfast, get my wife up. It's a happy time, it makes a good song."⁸

The importance of teaching improvisation in vocal jazz classes cannot be stressed enough, but there aren't comprehensive methods to explain the internalization process of the singer's music vocabulary, because we focus on the musical vocabulary, and not this internalization process. Understanding and expressing musical ideas is a focus, whereas sung improvisation should be a correlation among all the aspects of a performance: knowledge of music theory, previous musical practice, memorizing music, ear-training and sight-reading skills. The higher the proficiency in either of these directions, the higher the difficulty level of the improvisation.

⁸ (Sheldon, 2002; Waterman, 1990; 2008).

This is also applicable to the ability to converse, because the richer the vocabulary, the more fluent the conversation and this can have a very strong effect on the outcome of any important conversation – whether it may be a job interview, an oral exam, a public speech and so on.

In conclusion, vocal improvisation is a physiological and a cognitive complex of processes that aims to achieve eudaimonia, the “*quality of life derived from the development of a person’s best potentials and their application in the fulfillment of personally expressive, self-concordant goals*”⁹.

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⁹ Steven R Livingstone, *Facial expressions and emotional singing, a Study of Perception and Production with Motion Capture and Electromyography*, 2009.

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