CHAPTER THREE

QUEEN'S SNAKE: THE USE OF AUDIO PRODUCTION AS A MEANS TO SEMANTIC EXTENSION IN QUEEN'S "WAS IT ALL WORTH IT"

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An approach from the semiotics perspective

From the 1960s, and especially during the last two decades, semiotics has been an important influence on the ways of thinking about music. Sign and signification have been set to foreground and semiosis has emerged as an interdisciplinary path to perception and knowledge. Authors like David Lidov, William Dougherty, Robert Hatten, José Luiz Martinez, and Eero Tarasti[1] have applied the ideas of American philosopher Charles Sanders Peirce to musical analysis from different perspectives, obtaining noteworthy results.

Semiosis can be defined as the process by which meaning is produced and understood.[2] This process includes three elements that Peirce called *sign* (also called *representamen*, a thing that represents another thing), *object* (what the sign represents), and *interpretant* (the sense made of the sign). Peirce establishes a classification of signs based on three trichotomies: first, we have the sign's relation to itself, then the sign's relation to its object, and finally the relation between the sign and its interpretant. Three types of sign will arise from each trichotomy, resulting in a total of nine different kinds of sign.

Peirce's second trichotomy—the sign's relation to its object—distinguishes between *icon*, *index*, and *symbol*, and will be particularly

interesting in relation to our analysis object. Icons are signs that imitate or are similar to what they signify. As an example, we can take the birdsong at the end of the second movement of Beethoven's "Pastoral Symphony", where the flute mimics the nightingale, the oboe imitates the quail, and the clarinets sing like the peekaboo. Indices are signs directly connected—by causality or by spatial, temporal, or cultural proximity—to what they stand for (e.g. flamenco guitar as a sign of Spanish music), while symbols are connected only by convention to what they represent—its relationship must be learnt, like a national anthem or a leitmotiv.[3] However, it should be noted that, in many cases, different forms of semiosis are not isolated from each other. As we shall see later in our analysis, there are several levels of interdependence between the modes of significance.

Also influenced by Peirce's ideas, Philip Tagg has proposed an analytical model which emphasises the communicative potential of what he has called "parameters of musical expression."[4] These parameters are defined as "sets of properties constituting the vast variety of sounds we hear as musical",[5] and can be thought of in four interrelated and overlapping main categories:

1. Time, speed, and space.
2. Timbre and loudness.
3. Tone and tonality.
4. Totality (diataxis and syncrisis).[6]

Nevertheless, it is worth mentioning Tagg's words:

> Very few concepts denoting parameters of musical expression fit neatly into any one of the first three categories and [...] category 4 includes several by definition. For example, nothing in categories 2 (timbre and dynamics) or 3 (tone and tonality) can exist without the parameters of time and space (category 1); nor can elements of temporal organisation like rhythm and metre exist without timbral, dynamic or tonal patterning, nor can tone or timbre be understood without considering pitch and loudness.[7]

Over the last fifty years, technology has allowed the treatment of audio signals in multiple forms, enabling the alteration of the timbre of an original sound source in many different ways. This can be done especially through the use of a vast array of effect devices, ranging from distortion and filters to modulation and loudness effects.[8] Tagg is very critical about the academic world's tendency to "conceptualise parameters of musical expression hierarchically, as either primary—"syntax-based discrete relational categories (pitch, duration)"—or secondary—"tempo, dynamics, timbre." Such conceptual hierarchies are inapplicable to most of the music

we hear on a daily basis."[9] His criticism towards this hierarchical separation of parameters has much to do with that treatment given by the academy that we spoke of. From Tagg's 1982 analytical model we could already deduce a division between traditional analysis objects (i.e. time, melodic, orchestrational, tonality/texture, and dynamic aspects) and those less attended by music scholars (i.e. acoustical and electromusical / mechanical aspects).

As far as popular music is concerned, the works of musicologists such as Richard Middleton, Keith Negus or John Covach somehow cover this first group using traditional analytical models.[10] On the other hand, proposals of scholars like Paul Théberge, David Carter, Paul Ramshaw and, more recently, Simon Zagorski-Thomas,[11] usher in a new approach that considers audio production techniques as an object of academic interest. Much of this interest is certainly a logical heritage from initiatives such as the "Art of Record Production" or the "Audio Technologies for Music and Media" that, amongst others, have started a promising debate using audio production techniques as a means to approach academic discussion.

At the same time, this publications pay attention to production techniques mostly used by certain recording engineers or concrete references to recordings considered cornerstones of the music of our time. In most of these publications, the reader is usually given the knowledge needed to comfortably use these tools properly and, most importantly, to apply them in a creative way.

From technical praxis to reception

The study of audio production techniques from their first uses in commercial recordings to its social reception asks for the analysis of which effects have been applied to which sounds in which situation or context. At the same time, looking at their context, we need to understand why these effects are used. At this point, it is essential to give a more detailed description of the effects involved in our analysis object: phasing, flanging and panning. We will focus on the analysis of both its operation and its perception. Though there's no need to delve into this techniques on a detailed technical level, it is important to understand some basic acoustics and electro-mechanics to see why they sound the way they do.

On a technical level, our starting point will be a simple sine wave. If we duplicate it and, afterwards, we delay and superimpose this copy to the original wave, the sound will be reinforced in several places as soon as the phases of both waves are close to each other. When both waves are exactly

180 degrees out of phase and at equal amplitude, however, total cancellation occurs. With more complex waveforms, the overlapping of a slightly delayed duplicated signal creates what is known as a comb filter. In this kind of filters, frequency response has several amplitude peaks and valleys called teeth, which are distributed throughout the harmonic spectrum. Because of phase differences in the spectrum, some frequencies are reinforced while others are cancelled. When the delay time is modulated using a low frequency oscillator, the teeth move through the frequency spectrum, thus creating the characteristic rippling effect common to phasing and flanging, although both effects actually happen in different ways.

In phasing, the signal passes through all-pass filters which have a non-linear frequency phase response. This results in phase differences in the output signal that depend on the input signal frequency. Therefore, different frequencies of the original signal are delayed by different amounts, causing peaks and valleys without harmonic relation in the output signal.

The flanging effect, in turn, uses a delay which is equally applied to the entire signal. However, in this case, the delay—and therefore the phase shift—is uniform across the whole sound. This results in a comb filter with peaks and valleys that are related harmonically. Usually, the comb filter created by this uniform delay will have multiple evenly spaced teeth, while the phasing effect—depending on the design of the circuitry—will show few unevenly distributed teeth the spacing of which can be configured manually.

The reiterated use that the Beatles made of the *automatic double tracking* (ADT) and their mass-media stars position, could explain why many voices point them out as the pioneers in the use of this type of effects. Although ADT accidentally created an interesting palette associated with sound modulation—including the coining of the term *flanging* by Lennon and Martin[12]—, the procedure itself was devised earlier. In "Mammy's Boogie" (Capitol, 1953), Les Paul worked with a speed control in one of the coils used in the recording process.[13] Some years later, Toni Fisher recorded "The Big Hurt" (*The Big Hurt*. Signet, 1959) and, while trying to strengthen the final mix, engineer Larry Levine decided to double-track the whole recording "layering a copy of the tape over the original at a slightly different speed."[14] The process, quoted here by Levine himself, represents a testimony of great value as it moves precisely between the technical description and social reception:

> I lined up the two tapes and started the two machines simultaneously... and it stayed together, pretty much, for the first eight bars, and then one went

> out of phase with the other. [...] It ended up being a big hit record when it was released back in 1959, and people were trying to guess where it was made [...] a lot of disk jockeys were talking about it on the air, wondering if it was made at an airport with a big jet passing by.[15]

From a technical standpoint, Lavine's testimony may not represent a matter of particular interest. From the reception point of view, though, the association between the effect and the sound of an aeroplane can be revealing as it shows how the relation between sound effects and non-musical elements can play an essential role in the reception processes.

These relationships between phase modulation and significance will grow proportionally to the inclusion of this kind of effect in the sound production field. As it happened with distortion—which went from being an unwanted effect to such a creative tool throughout the 1950s—effects like flanging or phasing turn their early accidental condition into a powerful weapon with an interesting semantic potential. At this point, the effect begins to surround itself with a certain significance related to specific concepts such as unreality or dreamlike reverie. As Richard Brice says, "perhaps precisely because the sound quality was so unusual (recording engineers having striven to avoid its acoustic equivalent), John Lennon even employed this effect on vocals to depict the dreamy experiences of childhood."[16] Therefore, it is not unreasonable to consider that the use and acceptance of these "sound-equals-concept" associations got more and more relevant as some of the prime artists started to use them in similar directions. So we can assume that the uses of these effects in recordings like "Tomorrow Never Knows" (*Revolver*. Parlophone, 1966) or "Lucy In The Sky With Diamonds" (*Sgt. Pepper's Lonely Hearts Club Band*. Parlophone, 1967) may have played an important role helping to promote the use of an effect as a new instrument.

Despite the Beatles using this type of effects, it was not until the recording of "Itchycoo Park" (*Immediate*, 1967), by The Small Faces, that one of the first clearly intentional uses of flanging took place in popular music. During the recording, George Chkiantz (sound engineer who was not related to the record but working at the same studio) suggested the effect to Glyn Johns, the producer. Johns looked for a place in which to use this effect. The choice of the song, considering its subject and the placement of the effect in the lyrics—the song was banned by the BBC due to its obvious reference to drugs[17]—cannot be coincidental.

Sound and movement

In sound production, there are a number of techniques that can be used to imply or signify movement. Using natural or artificially generated reverberation, it is possible to project the sense of space needed to give some context to any type of movement. Nonetheless, there are other effects that offer more possibilities when it comes to the discussion of this type of motion. It is the case of panning, in which movement is generated and perceived through the distribution of sound across the stereo field. Unlike reverb, panning is only possible in stereo or surround, but never in monaural systems. This is because the latter send the same signal to each output channel or speaker, independently of its number. However, panning is generated precisely by managing different intensities in each one of the channels. Once these tools have been analysed on a more general level, we need a model to understand how they work in each particular musical situation.

At this point, it is necessary again to address some of the concepts that Philip Tagg often uses in his semiotic analysis: kinetic and spatial anaphone. As a result of the union of the terms *analogy* and *sound* (*phonos*), the term *anaphone* refers to the imitation of non-strictly musical (*paramusical*) sound objects through music. Tagg classifies anaphones into three categories: sonic, tactile, and kinetic. At the same time, he refers to the three modes of perception that operate interrelated: sound, touch, and movement. That leads us to classify certain sound in one of these categories depending on "which mode of perception [...] is most striking in the link between musical structure and paramusical phenomena."[18] When these modes of perception act simultaneously, a fourth category is generated. We are talking about the composite anaphone. Since few times in the perception of sound a sole possible interpretation is derived, this category offers a more open and realistic analysis.[19]

Sonic anaphones are fundamentally related to imitation of sounds external to the musical discourse (Tagg calls this process *stylisation*). It could be any existing sound generated by any element of the world around us: human, animal, mechanical, artificial or natural. It could also be the sound of a train (its wheezing or its mechanism), an ambulance siren, a song of a bird, etc. Secondly, we find tactile anaphones, which refer to the various tactile sensations that can produce sound perception and that, as Tagg observes, are often associated with the timbral properties of music. This applies to adjectives like *soft*, *gentle*, *velvety*, *rough*, *coarse* or *grainy*, all of them used in areas as diverse as audio production, musical criticism or musical analysis very often.

Finally, kinetic anaphones refer to the relationships that can be established between sound and movement. Tagg subdivides this category depending on the complexity of the movement that the music depicts. Within this category, we first find those anaphones that refer to broad movements like those of a body or a group of human bodies, animal or mechanical objects. Here, we can place activities such as *running*, *driving*, *jumping*, *galloping*, etc. It is what Tagg calls "the gross-motoric side of kinetic anaphones."[20] On a second level, we find the fine-motoric element: finer, smaller, and lighter movements. We could include a *blink*, a *kiss* or a *chill* here. Having reached the third level, we must consider that the concept of movement has, in any situation, spatial implications. In this "physical domain of representation" the elements of the other two levels are combined in a space-time interaction. Tagg labels them as *holokinetic anaphones* in which different objects or bodies are positioned in relation to themselves and to a virtual space only through music.

It is within this last level that we find spatial anaphones. This type of anaphone can be observed in any musical situation where, either by using effects or by using specific recording techniques, a "virtual acoustic space in the listener's speakers, headphones and actual head"[21] is generated. This sound's ability to create spatial sensations has implications that go beyond the simple virtual location of a musical band and its different parts. As we have mentioned when speaking about the reverb effect, it is possible to create a room-like feeling which is not real but realistic. The accurate use of it can enable the listener to project complex situations like a singer in a big hall or a full band in a small room in her or his mind. But as Tagg himself states, the most usual form of anaphone is its composite version. Let's see some examples.

Queen's Snake: a case analysis

Modulation effects as a semantic tool in Queen's catalogue

British rock band Queen made an extended use of modulation effects in vocals, guitars, and drums. In fact, their first single "Keep Yourself Alive" (*Queen*. EMI, 1973) is already an interesting sample of an intentional use of tape phasing.[22] The opening guitar riff is based on the so called *gallop rhythm*,[23] a rhythmic pattern typically used in heavy metal songs, either on rhythm guitar or on drums. What takes the riff from "Keep Yourself Alive" further than others is precisely the phasing effect that seems to meaningwise fill in the *horse galloping feel* of this rhythmic pattern. Again, the result of the effect—with its periodic oscillation—

enhances the concept of movement adding another kind of periodic circularity to an already cyclical pattern (see Fig. 3.1):

Fig. 3.1. A prototypical gallop pattern based on the alternation of one quaver and two semiquavers.

Here, we can go back to Philip Tagg's theory and his "gross-motoric side of kinetic anaphones." Tagg already uses the gallop rhythm to explain this perception of movement in the aesthesic side of musical communication. Later, though, he admits a wider meaning to this example relating it to sonic anaphones, too, as it is clearly a stylisation of the sound of a galloping animal, not only of its motion. As he explains, this double meaning of the same analysis object forms a composite anaphone.

We could find a pretty long list of tracks in Queen's catalogue where modulation effects play some kind of semantic role. In "Bohemian Rhapsody" 's intro (*A Night at the Opera.* EMI, 1975), a panned shifted crash with a flanging effect is heard upon the words "any way the wind blows" (00:41) enabling us to hear *the wind* moving from left to right. In the same album we find this same effect in "I'm In Love With My Car", this time used on guitars and drums. The use of flanging is even more apparent in "Killer Queen" (*Sheer Heart Attack.* EMI, 1974), where we can hear it on vocals upon the phrase "dynamite with a laser beam" (00:31). In this case, we find an obvious relation with the sci-fi genre in movies and TV, where flanging has been largely used to represent the sound of all kind of laser artefacts. In the first two examples we are facing composite anaphones which add the sound of the wind and the car engine respectively to those ideas of motion.

A snake tongue travelling in time

In 1978, Queen released their seventh album (*Jazz*, EMI) including the song "Let Me Entertain You" in which we find some interesting production tricks like several heavy volume swells and sudden dynamic level changes. These techniques were widely used by the band in many of their records and were usually related to some concept expressed in the text. "Let Me Entertain You" offers different examples: from an artificial volume rise at the end of the first verse (00:38) to a drastic volume and panning change applied to guitars while Freddie Mercury sings "sound and

amplification, listen..." (01:32). But our interest will focus on a particular part of the text that is treated with such a weird effect: a panned flanging sound synchronised with the final phoneme in the word *merchandise* (01:01):

> *I've come here to sell you my body*
> *I can show you some good* merchandi**sssse**
> *I'll pull you and I'll pill you*
> *I'll Cruela-de-ville you*
> *And to thrill you I'll use any device*

Why is this flanging effect there? Is it accidental? Of course it might not be so at all but, if there is an intention, what is the hidden meaning behind this sound manipulation? Except for those readers with—let's say—some kind of foresight, we had to wait more than a decade to discover the meaningful use of this effect. In 1989 Queen release their penultimate studio album (*The Miracle*, EMI) and we find this same trick in the song "Was It All Worth It" again but, this time, a stronger relation between sound effect and text gives us the ultimate clue:

02:37 - *"yes we were* vicious**sssss**, *yes we could kill..."*

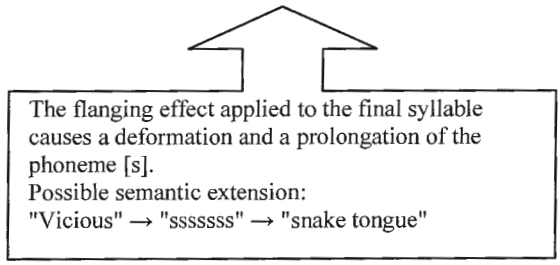

Fig. 3.2.

Figure 3.2 shows us that we are facing a semantic extension where sound acts as the trigger that moves the text towards a new meaning. As in "Bohemian Rhapsody" 's intro, the effect has been produced using a crash cymbal, treated with flanging and later panned and synchronised over the end of the word *vicious*. This causes a possible extension of the semantic field by lengthening the phoneme [s] and creating a sound that unequivocally resembles the tongue of a snake. The sound alteration of a single phoneme of the word "vicious" metaphorically expands its meaning

("sssssss" → "snake tongue"). This is a clear example of a sonic anaphone where the sound effect upon the phoneme [s] acts as a musical sign (icon) connecting us with the idea of a snake. We must recall that in many cases, the different forms of semiosis are not isolated from each other; there are several levels of interdependence between the modes of significance. In this case, the iconic relation between the extension of the phoneme [s] and the sound of a snake's tongue becomes a symbolic relationship that extends the information provided by the sign.

At this point, it will be interesting to review, although superficially, the strong cultural connotations of the snake as a symbolic element. The serpent has been used as a symbol by many societies and cultures throughout history. However, different meanings—often contradictory—are attributed to it. In many worldviews, snakes have been regarded as the embodiment of the vital principle and the forces of nature and have also been considered as a symbol of the soul and the libido. Kundalini, Ananta, Naga, Ouroboros, Leviathan, Quetzalcoatl, Atum or Python are some of the names that the serpent has received, holding a prominent place in the imagination of many cultures.

Although in some Christian texts the snake is interpreted from different perspectives, since the Middle Ages a negative image of the serpent—that will become malignant, bearer of the worst vices and representative of temptation and sin—was generalised. But in the last two centuries, numerous poets and artists have claimed for the integration of nocturnal snake symbolic values. According to French writer, philosopher, and theologian Jean Chevalier, since the Romantic period the symbol of the serpent will be strongly claimed again as a metaphor of the inseparable link between good and evil, pleasure and pain, the lawful and the forbidden.[24] Chevalier also points to the Surrealist movement as one of the most interested in solving these indivisible forces. And although it may seem a coincidence, surrealism leads us back to the relationship between sound and text in our analysis object.

"Was it all worth it" is a song with a strong autobiographical content, and through the symbol of the serpent, Queen looks back into a past where vice played a role that does not have to be repudiated at all. Surrealism also appears in the text to describe some of the creative sides of the band, and it is in this case where the semantics of sound plays an interesting role for analysis again.

Figure 3.3 shows how the result of the process applied to the word *surrealistic* is similar to the previous one (Fig. 3.2) but, in this case, it does not involve any semantic extension: the flanging and panning effects enhance the meaning (surreal) by altering the sound of the whole signifier:

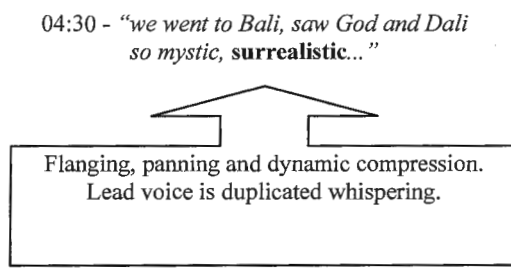

Fig. 3.3

Finally, dynamic compression[25] also plays an important role as the voice of Freddie Mercury is duplicated with a whisper. To get that whisper clearly audible when it is next to the loudness of a rock band, the vocal track must be moved towards a sonic plane which is obviously unnatural in terms of acoustics. Even though this is an effect that goes beyond our approach, dynamic compression helps to generate what neuroscientist Daniel Levitin has described as "sound hyper-reality"—i.e. sensory impressions made by audio production techniques that we never actually have in a real world.[26]

That completes a battery of resources used with a clear intention: to affect the message's perception even beyond the meaning of the text. While in the case of audio compression we could think of some professional inertia in the field of audio production, the use of flanging and panning becomes a creative tool whose semantic potentiality has not been much studied yet.

Conclusions

The aim of our analysis of "Was It All Worth It" is to show how the use of flanging and panning can run as an effective tool for semantic purposes. Although our analysis is focused in such a particular case, we find it stimulating enough to broaden the academic debate about the relationship between sound and meaning. In that sense, the theoretical and analytical apparatus proposed by Phillip Tagg is of great interest not only because it offers an alternative to traditional models of musical semiotics but because it has been able to identify some elements of musical expression that come from the audio production field and have not been addressed yet.

At the same time, this perspective opens the door to rethink the way we understand this techniques and tools, removing the distinction between

technology and musical instruments. Music creation has always been built around technology changes—e.g., key mechanisms in flutes or the invention of fortepiano—and this modifications have continued affecting music in every new device used to make it. This statement leads us to see sound production and its techniques as a natural next step in music creation.

Furthermore, some of these techniques contain a lot of elements that are not accidental at all: they have been "embedded" to work with a particular intention and therefore, they are sources of meaning. The study of these elements allows a particular approach to the popular music phenomenon that, together with other complementary perspectives, may be helpful to dig deeper into both technical and musical creativity.

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Notes

[1] See Lidov, "Music"; Dougherthy, "The Play of Interpretants…"; Hatten, *Musical Meaning in Beethoven*...; Martínez, *Semiosis in Hindustani Music*...; Martínez, "Semiótica de La Música"...; Tarasti, *Signs of Music*....
[2] Tagg, *Music's Meanings*..., 156.
[3] Martinez, "Semiótica de la música".... 181-2.
[4] Tagg, *Music's Meanings*, and Tagg, "Analysing Popular Music'"..., 37-65.
[5] Tagg, *Music's Meanings*, 263.
[6] Tagg defines diataxis as the "arrangement/disposition/order of musical episodes in terms of chronological placement and relative importance" and syncrisis as "musical form in terms of the aggregation of several simultaneously ongoing sounds perceptible as a combined whole inside the limits of the extended present". Tagg, Ibid, 586, 603.
[7] Ibid., 271.
[8] Ibid., 309-315.
[9] Ibid., 265.
[10] See Middleton, *Studing Popular Music*; Middleton (ed), *Reading Pop*; Negus, *Popular Music in Theory*; Covach and Boone, *Understanding Rock: Essays in Musical Analysis.*
[11] See Théberge, *Any Sound You Can Imagine*; Carter, "Well Past Time: Notes on a Musicology…"; Ramshaw, "Is Music Production Now a Composition Process?"; Frith and Zagorski-Thomas, *The Art of Recording Production*...; Zagorski-Thomas, *The Musicology of Record Production.*
[12] See Brice, *Music Engineering*; Lewisohn, *The Complete Beatles Chronicle*; Martin and Pearson, *Summer of Love: The Making of Sgt. Pepper.*

[13] See Harald, "History of Electronic Sound Modification", 730; Thompson, *The Stompbox: A History of Guitar Fuzzes*, 24.
[14] Ribowsky, *He's a Rebel...*, 120.
[15] Massey, *Behind the Glass, Volume II*, 32-44.
[16] Brice, *Music Engineering.*
[17] Hellier and Hewitt, *Steve Marriot: All Too Beautiful*, 154.
[18] Tagg, *Music's Meanings*, 503.
[19] Ibid., 509.
[20] Ibid., 499.
[21] Ibid., 500.
[22] In the seventies, tape phasing was made by taking the tape off the sync head, putting it through a couple of other tape delays, and then bringing it back with the play head. That could be applied to a particular track or even to the whole mix — e.g. the fade out in "Killer Queen" (*Sheer Heart Attack*, EMI 1974) or in "If You Can't Beat Them" (*Jazz*, EMI 1978).
[23] When played on the guitar, this rhythmic figure may be used on palm muted power chords providing an accompaniment rhythmic ostinato. Some well-known examples are "Barracuda" by Heart, "Immigrant Song" and "Achilles Last Stand" by Led Zeppelin, "I Was Made For Loving You" by Kiss or the famous bass riffs created by Iron Mainden's Steve Harris.
[24] Chevalier, *Diccionario de Los Símbolos*, 937.
[25] Dynamic compression reduces the overall dynamic range of a signal eliminating peaks and giving more presence to quieter sounds. It reduces gain automatically as the signal level goes beyond a threshold —a preset level in dB. The amount of this reduction is controlled through the compression ratio. A ratio of 2:1 would mean that for every 2dB over the threshold in input amplitude, only 1dB would make it to output signal. Under the threshold, signal stays unaffected with a ratio of 1:1.
[26] Levitin, *This Is Your Brain in Music*, 106.