THE LOUDNESS RACE:
A POSTHUMAN INTERPRETATION

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Have you ever listened to an mp3 player in shuffle mode, or to a mix CD that your best friend prepared for you, or to a play-list of your favorite music on your computer, and found yourself frantically reaching for the volume knob as soon as the next song comes up because the volume is either too soft or too loud? If the answer is yes, then you are somewhat aware of the trend in recorded music that is generally referred to as the 'loudness race' or the 'loudness war.' In this paper, I will refer to it as the loudness race or, more succinctly, the race, mostly because I prefer not to reinforce another trend in American society, which is to call everything a 'war,' whether it is on drugs, on terror, on poverty, and so on. While it is true that the 'loudness race' locution is also somewhat militaristic in nature (i.e. the arms race), it is also true that negative connotations tend to serve a specific purpose; in this case, it would be the belief held by some in the industry that the trend toward greater and greater loudness is having a deleterious impact on music in general.

In a nutshell, the 'loudness race' label was created to describe a trend toward ever increasing inherent loudness in recorded music. It is generally accepted that this trend started in the 1950s, with the advent of the 7 inch 45 rpm single,[1] and that starting in the early 1990s it has become increasingly noticeable and worrisome (Levine 2007). Because recorded music is becoming louder, some producers, engineers, and recording artists have become concerned about the effects that this trend is having on the music business and on music in general. One may say: "So what if music is becoming louder, I'll just turn down

[1] Bob Ludwig, interviewed by Robert Siegel, *All Things Considered*, NPR, December 31, 2009. http://www.npr.org/templates/story/story.php?storyId=122114058&sc=nl&cc=mn-20100102 (accessed July 30, 2010).

the volume." While it is true that the end user has control of the overall output volume, as I have pointed out in the beginning with my mix CD/shuffle/play-list question, the only way for the end user to control the 'relative' loudness of each individual track while listening to music is to keep adjusting the volume from song to song. This issue is generally not noticeable within individual albums because one of the main tasks of the mastering engineer is to give the album a somewhat uniform overall loudness level.

Figure 1 shows the waveform of the song "Something," by the Beatles, re-mastered over the course of twenty years. See how the size of the wave gets bigger with every subsequent mastering.

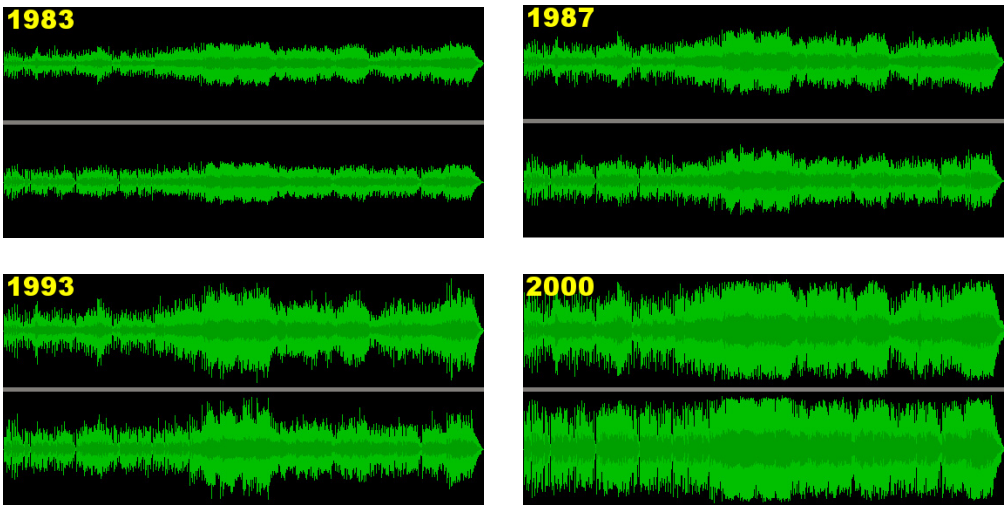

Figure 1. *Left to right*. The Beatles, "Something.", *Abbey Road*, Toshiba, 1983; *Abbey Road*, EMI, 1987; 1967-1970, Capitol, 1993; *1*, Apple, 2000.[2]

But is the loudness race necessarily something negative, as those who are most vocally opposed portray it, or are there forces at play that are not inherently 'negative'

[2] *Source: Wikipedia, The Free Encyclopedia*, s.v. "Loudness war."

per se, but simply a reflection of a larger trend in popular culture and in society as a whole? And what are the effects, if any, that the reduction in dynamic range of recent popular music has on the creativity of those who listen to it? Answering these questions is the main goal of this paper. My intent is not to take sides, but simply to show how there may be larger forces than those advanced by its critics at play. By tracing the history of the trend, I will try to make the point that the increased loudness in contemporary recorded music can be seen as the by-product of a culture that is 'getting louder' at all levels, and that, for this reason, the types of ameliorative solutions currently discussed may be inadequate and ineffective. I will also attempt to show how the loudness race can be seen as part of a broader phenomenon, namely, the emergence of a posthuman subjectivity in contemporary society (Hayles, 1999), and how those fighting the 'war' generally fall on the liberal humanist subject side of the equation. Finally, like others before me, I will raise issues of *authenticity* and of *musicality* in music. But first, I want to spend a little time clarifying what 'loudness' is and how it is measured and, most importantly, perceived.

In general terms, loudness is a measure of the intensity of sound and is measured on the decibel SPL (sound pressure level) scale. One decibel (abbreviated dB) equals one-tenth of a bel (named after teacher, scientist, and inventor Alexander Graham Bell), and is "defined to represent a *ratio* of 10 to 1 between two intensities." For this reason, "a bel is *not* an *amount* of sound," but "a *relation* between two sounds". In other words, if sound A is 10 dB and sound B is 20 dB, sound B will feel 10 times louder. And if a third sound C is 30 dB, sound C will feel 10 times louder than sound B and 100 times louder

than sound A, meaning that as "*intensity ratios are multiplied, level differences in dB are added*" (Hall 1991, 74). Today, the accepted SPL *standard reference level*, what we arbitrarily call 0 dB, or the threshold of human hearing, is the sound of "a mosquito flying ten feet away" in a quiet room (Levitin 2006, 68). From all this, the important thing to remember is that the decibel scale is not a linear scale but a logarithmic one, and that it is designed to correspond to the human perception of sound intensity. One last distinction that needs to be made is that between *peak sound level* and *average sound level*. The *peak sound level* is the level of a sound wave at any given instant (or transient), while the *average sound level* (also known as RMS or root-mean-square) is the "average level of a waveform over time. Since humans perceive loudness according to a signal's average value" (Huber 2009, 488), the *average sound level* is the most useful representation of what we generally call loudness. Now that we have a better understanding of what loudness is and how it is measured, we should turn our attention to the origins of the loudness race.

According to Grammy® winning mastering engineer Bob Ludwig, the first wave of the loudness race started when record producers realized that by making a record sound louder it would improve its chances of standing out above the competition:

> When I first got into the business and was doing a lot of vinyl disc cutting, one producer after another just wanted to have his 45 sound louder than the next guy's so that when the program director at the Top 40 radio station was going through

> his stack of 45s to decide which two or three he was going to add that week, that the record would kind of jump out to the program director, aurally at least.[3]

In 2005, journalist Sarah Jones asked ten mastering engineers their take on the loudness race for a Mix Magazine Online piece titled "The Big Squeeze." In the article, she quotes Nashville mastering engineer Bob Holhsson who, along Bob Ludwig's lines, stated that in the 1960s, "Motown [Records] was notorious for cutting some of the hottest 45s in the industry" (2005). But program managers at radio stations were not the only targets of these hot recordings. Stylus Magazine's Nick Southall believes that the loudness race "has been going on almost as long as pop music has existed" because "nobody has ever wanted their record to be the quietest on the jukebox or the radio" (2006). Times' correspondent Adam Sherwin recounts how "[t]he Beatles lobbied Parlophone, their record company, to get their records pressed on thicker vinyl so they could achieve a bigger bass sound" (2007). Apparently, the Beatles felt that the vinyl medium, as it existed, was no longer adequate for their artistic aims and, for this reason, they were trying to find ways to expand its dynamic range. But before getting into dynamic range any further, we should try to find out why humans seem to be instinctively drawn to louder sounds.

Anyone who has watched commercial TV or radio is probably aware of the practice by TV and radio stations to turn up the volume during commercial breaks. TV and radio stations do this because they know that a sudden increase in loudness will

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[3] Bob Ludwig, interviewed by Robert Siegel, *All Things Considered*, NPR, December 31, 2009. http://www.npr.org/templates/story/story.php?storyId=122114058&sc=nl&cc=mn-20100102 (accessed August 6, 2010).

attract the attention of the listener. In his book *This Is Your Brain on Music: The Science of a Human Obsession*, cognitive psychologist Daniel Levitin writes that "our perceptual system is exquisitely tuned to detect changes in the environment, because change can be a signal that danger is imminent." Levitin continues by explaining that while each of our five senses has evolved to detect and alert us to sudden changes in the environment, "the auditory startle is the fastest and arguably the most important of our startle responses" (2006, 181). Since turning up the volume is such an easy and sure way to grab people's attention, it is then understandable why TV, radio, and record producers would want to exploit this powerful survival mechanism. But as anyone who has tried to crank the volume of a music player all the way up can attest, there is a limit to how loud a signal can be made before it begins to distort. And this is where dynamic range compression comes into play.

As we have seen earlier, loudness is a relative measurement between two sounds. Dynamic range is defined as the differential in loudness between the lowest audible sound and the loudest peak. Live music[4] can easily exceed a dynamic range of 100 dB (Hall 1991, 76), which is greater than the dynamic range of vinyl LPs (around 60 dB, at best) as well as that of CDs (around 90 dB). Because of the dynamic limitations of recorded mediums, sound engineers utilize devices called compressors, which 'squeeze' the dynamic range of the source material so that it can fit within the dynamic range of the target medium. The way dynamic range compressors do this is by lowering the loudness of the high peaks and/or by raising the loudness of the low peaks. Because humans

[4] For a discussion on the implications of the usage of the term *live* in relation to music performances that are not reproduced, see Sterne (221).

perceive loudness as an average over time, with dynamic range compression it is possible to increase the loudness of a song, even while decreasing its loudest peaks. Needless to say, it did not take long for producers to realize this even though the process comes at a price, which is a loss of dynamic range. During the age of vinyl, the relatively small dynamic range of the medium did not leave much headroom for engineers to play with. Their main concern, at the time, was to create an 'acceptable' sonic compromise, in order to fit the dynamic range of a music performance onto the format. It was this perceived limitation that prompted people to find ways to extend the range of the medium, as we have seen with the Beatles lobbying their label to use thicker vinyl. Seen in this light, the *high fidelity* (abbreviated *hi-fi*) movement, which arose with the appearance of the LP, can be partly seen as an effort to squeeze every possible ounce of dynamic range out of the recorded medium, through the use of increasingly more sophisticated equipment. At this point, it is worth tracing the birth and evolution of the *high fidelity* movement, as I believe it is where the of the backlash against the loudness race partially comes from.

The locution *high fidelity* originates from the idea that recorded music is a form of mediation, a representation of live sound encapsulated onto a recorded *medium,* rather than an exact copy of the original. In his book *The Audible Past: Cultural Origins of Sound Reproduction*, Johnatan Sterne writes:

> Within a philosophy of mediation, sound fidelity offers a kind of gold standard: it is the measure of sound-reproduction technologies' product against a fictitious external reality. From this perspective, the technology enabling the reproduction of sound thus mediates because it conditions the possibility of reproduction, but, ideally, it is supposed to be a "vanishing" mediator – rendering the relation as transparent, as if it were not there. Inasmuch as its mediation can be detected,

> there is a loss of fidelity or a *loss of being* between original and copy. In this philosophy of mediation, copies are debasements of the originals. (Sterne 2003, 218)

From this passage we can see how the concept of *high fidelity* was born out of the desire to bridge the gap between original and copy as much as possible, toward the ultimate goal of *perfect fidelity*. But as Sterne points out, and as we shall see later on in this essay, the quest for true fidelity "is much more about faith in the social function and organization of machines than it is about the relation of sound to its "source"" (2003, 219).

Like many other technological innovations we are accustomed to today, the hi-fi emerged out of the massive investment in research and development during the Second World War as part of an effort by the American government to build people's confidence in science and technology. In *Strange Sounds: Music, Technology, and Culture*, Timothy Taylor recounts how during the postwar era, the American public was highly ambivalent towards science and technology because of the atomic bombs dropped on Hiroshima and Nagasaki in 1945. This powerful and devastating event had the effect to reinforce the preexisting fears and anxiety that the American public harbored toward science and technology (Taylor 2001, 72). The discovery of atomic power, and the beginning of the Cold War, meant that the U.S. government had to find a way to sell the idea of nuclear energy and of stockpiles of nuclear missiles to a populace wary of anything associated with the atom. For this reason, "the government launched what amounted to a massive public relations campaign in an attempt to make the atom palatable" (2001, 73). Private corporations, like the Walt Disney Company with the 1956 television program and book

Our Friend the Atom, also took part in this effort to 'domesticate' the atom. The subtitle of the September 1958 feature article of National Geographic read: "Abundant energy released from the hearts of atoms promises a vastly different and better tomorrow for all mankind" (Fisher 1958; Taylor 2001, 74).

Aside from being part of the general effort of domestication of the atom, the hi-fi also presented itself as an opportunity for men to reclaim a space for themselves in the 'proper' of the home. In the traditional division of gender roles, the home had been viewed as the woman's domain. Men, with their cars, tools, and what not, had generally been relegated to the garage, the basement, or a shed. Building upon this observation by Barbara Ehrenreich in *The Hearts of Men*, Taylor explains that, because sound has the peculiar characteristic of being able to propagate in space, "men and their hi-fis could colonize the entire living room and beyond" (2001, 80). Up to that time, the presence of the phonograph in the living room had been marketed as another piece of furniture. In his book *Recorded Music in American Life: The Phonograph and Popular Memory, 1890 – 1945*, William Kenney writes about how, in 1906, the Victor Talking Machine company marketed its new Victrola as "elegant and artistic in appearance." Kenney describes it as "an unintrusive piece of Victorian furniture worthy of refined middle-class parlors, and, in its more glided and ornate reincarnations, upper middle-class parlors as well" (2003, 51). This example shows the different view that marketers had of technology in the early part of the 20th century. At the time, technology was something that had to be hidden from view in order to gain the acceptance of middle and upper middle-class Americans. In the space age, on the other hand, component hi-fis were marketed as technological

marvels that could and should be ostensibly displayed in the audiophile's living room or, better yet, the 'listening room.' In *Strange Sounds* Taylor also points out that hi-fis where not targeted solely to men but to women as well. As we will see later on, the Apple Corporation managed to combine the appeal of the men's *complex* hi-fi technology with the simplicity, ease of use and the style of the push-button technology that was marketed to women during the space age (2001, 80).

Not surprisingly, those who have been most vocal against the loudness race, "those in the trenches" (Jones 2005), are either the descendents or, sometimes, the very same space age audiophiles, as it is the case with veteran mastering engineers Bob Ludwig and Bob Holhsson. As a matter of fact, in the music world, mastering engineers are regarded as the cream of the crop of audiophiles, the ultimate high-fidelity connoisseurs who are surrounded by a magical aura of mystery and mystique. Not unfairly, I might add, as they are the ones who put the final 'creative' touch on most recorded music that reaches our ears. Incidentally, mastering engineers are also the ones who, whether willingly or not, are literally driving the loudness race. To dispel the possible perception that I am being purposely factitious in my description of mastering engineers, here is how J.J. Jenkins introduced his "Masters on Mastering" article in the September 1, 2003 issue of Electronic Musician:

> Many recording musicians will gladly talk your ear off on subjects like what their favorite mic[rophone] preamp[lifier] is, how they get the most realistic kick-drum sound, and what the best-sounding monitors are; but if you ask them about mastering, you're likely to get a healthy dose of silence. That's because for many, the mastering process is shrouded in mystery. A finished mix gets sent to the mastering facility and returns to you shiny, polished, and bathed in that new-car

> smell. But how did it get that way? And what exactly does the mysterious man behind the curtain do? (Jenkins 2003)

In the article, Jenkins features three mastering engineers. One of the three is, again, Bob Ludwig who, , is one of the spearheads in the effort to reverse, or at least mitigate, the loudness race. Ludwig tells Jenkins that "[t]his horrible trend started about eight years ago [1995] with the invention of digital domain 'look-ahead' compressors." He points at the TC Electronic Finalizer as the "most infamous of all," "a great piece of gear that is often misused." Ludwig goes on saying that "[n]ever in the history of the human race have people been exposed to sounds as compressed as in the past few years" (Jenkins 2003). In this interview, we can see how Bob Ludwig expresses modernism's ambivalence toward technology, which "stems from the alternating fascination and horror with which we behold its most dangerous potential" (Burton 2009, 1). In the modernist view, technology is perceived as being both the source of great promise for the future, "a genii at men's bidding" (Fisher 1958), as well as harboring the seed of destruction. Because of its double edged sword nature, technology should then be controlled solely by the 'more capable set of men.'[5]

Aside from pointing to the misuse of technology as one of the forces driving the loudness race, another interesting issue that Ludwig raises is that of the effect that the loss of dynamic range is having on music. For Ludwig "it's a fact that highly compressed music is tiring to the ear and doesn't make you want to listen to something over and over

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[5] I am borrowing a phrase by James Madison who, at the U.S. Constitutional Convention, famously said that "the Senate would be generally a more capable set of men," to show how liberal humanism – the source of modernism's ambivalence toward technology – is at the basis of the American system of government.

again." He also hypothesizes that this loss of 'musicality,' as he calls it, might be one of the causes of the recent decline in CD sales, which I will discuss later on. Cognitive psychologist Daniel Levitin also raises the issue of loud music being tiring to the ear in a 2007 interview for Rolling Stone magazine. In the interview, Levitin tells Robert Levine that "[t]he excitement in music comes from variation in rhythm, timbre, pitch and loudness," and that "[i]f you hold one of those constant, it can seem monotonous." According to this theory, brain fatigue due to constant loudness makes the listener want to either stop listening or move on to the next song (Levine 2007). But in his book *This Is Your Brain on Music*, Levitin also writes that many people also happen to enjoy loud music. He writes that loudness levels over 115 dB – the typical level one may experience at a concert or at a dance club – seem to put people into what they themselves describe as "a special state of consciousness." While the author admits that there is yet no research to corroborate this hypothesis, he believes that this sensation may be due to the fact that "loud music saturates the auditory system, causing neurons to fire at their maximum rate" (2006, 69). Future findings in this regard may shed some light on this seemingly contradictory effect of extreme loudness, which in many respects resembles that of a drug, with an initial exhilarating effect followed by fatigue and nausea (Sherwin 2007).[6]

In addition to people in the music industry, some music fans are also speaking up against the loudness race. A page 1 article in the *Wall Street Journal* reported that thousands of "bitterly disappointed" Metallica fans had signed an online petition (close to

[6] Sherwin writes that mastering engineer Peter Mew, "who joined Abbey Road in 1965 and mastered David Bowie's classic 1970s albums, warned that modern albums now induced nausea."

22,000, so far)[7] asking that the band's album *Death Magnetic* be re-mixed or re-mastered. The backlash started after a disgruntled fan posted, on Metallica bulletin board, a personal reply by mastering engineer Ted Jensen that concluded: "Believe me, I'm not proud to be associated with this one" (Smith 2008). In a different piece for the New York Times, Levine writes that to assuage what Joel Oberstein calls the "new generation of audiophiles," Warner Brothers Records decided to release Tom Petty's reunion album of Mudcrutcher in two versions: a CD mastered to current loudness levels, and a vinyl LP with a companion CD from a quieter master with a wider dynamic range. The latter CD comes with a label that "instructs listeners to play it on a good stereo and turn it up" (2008).

But mastering engineers, cognitive psychologists, and audiophiles are not the only ones who are raising their voices in the effort to halt and reverse the loudness race. Many prominent recording artists such as Bob Dylan, Steely Dan's Donald Fagen, John Mellencamp, and Neil Young are also joining the chorus. Fagen's 1982 solo album *The Nighfly* is considered by many in the recording industry a 'reference album,' something against which new recordings should be measured.[8] Fagen believes that music today sounds worse despite all the technical innovation, and that because of the loss of dynamic range, there is a loss of detail in the music (Levine 2007). For Bob Dylan, it is a straight out fight, and the enemy is technology itself:

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[7] Ian, "Re-Mix or Remaster Death Magnetic!," *GoPetition.com*, Sepember 10, 2008. http://www.gopetition.com/petitions/re-mix-or-remaster-death-magnetic.html (accessed, August 6, 2010)

[8] Paul White, interviewed by Big George, Industry Interviews, *BBC*, May 29, 2006. http://www.bbc.co.uk/threecounties/content/articles/2006/05/24/industry_paul_white_interview_feature.shtml (accessed August 6, 2010)

> "You do the best you can, you fight that technology in all kinds of ways, but I don't know anybody who's made a record that sounds decent in the past twenty years, really. You listen to these modern records, they're atrocious, they have sound all over them. There's no definition of nothing, no vocal, no nothing, just like – *static*. Even these songs probably sounded ten times better in the studio when we recorded 'em. CDs are *small*. There's no stature to it. I remember when that Napster guy came up across, it was like, 'Everybody's gettin' music for free.' I was like, 'Well, why not? It ain't *worth* nothing anyway.'"[9]

Talking to the press after his JavaOne keynote address in 2008 Neil Young famously said that "[p]utting on a headphone and listening to MP3 is like hell."[10]

Today, the mp3 (short for Motion Picture Experts Group 1, Layer 3) has become the main format that people use for listening and exchanging music. Digital audio, first introduced with the Compact Disc in 1982, revolutionized the way music was codified, manipulated, and stored. In digital audio, an analog-to-digital converter (ADC) samples an analog sound wave at specific time intervals, and then converts it into digits, a sequence of 1s and 0s, which is then stored onto a medium such as a CD or an iPod. In simpler terms, "sampling works like a jigsaw puzzle: a sound is cut up into pieces and then put back together to form a digitized "picture" of that sound" (Katz, 2004, 138). Just like in a digital picture, the higher the sampling rate, the more defined the picture will be. Since the advent of digital audio, the industry standard sampling rate for CDs has been 44,100 Hz, meaning that every second of music is divided into 44,100 sound samples. Each sample is then stored as a string of 16 digits. Silence, for example, is codified as a string of 16 zeros. The high sampling rate of digital audio is generally considered to be

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[9] Jonathan Lethem, "The Genius of Bob Dylan," *Rolling Stone*, August 2006.

[10] Dan Farber, "Neil Young Rocks JavaOne," *News.com*, May 6, 2008. http://news.cnet.com/8301-13953_3-9937142-80.html (accessed August 6, 2010)

fine enough to 'trick' the human ear into perceiving it as an exact reproduction of the original analog sound wave (2004, 138-9).

The mp3 is a digital compression algorithm designed to reduce a digital sound wave into a file up to a 10th smaller than the original, depending on the specified sampling rate. For this reason, the mp3 is called a 'lossy' format because it discards some of the data at the very high and low end of the spectrum in order to achieve its intended goal. At its highest compression rates (96 kbps, or 128 kbps) the loss of data is clearly audible to most people, as Neil Young's colorful assessment of the technology can attest. Basically, the mp3 is a sample of a sample, which, in terms of quality, is sort of like making a photocopy from a photocopy, rather than from an original. Green Day's producer Rob Cavallo compares mp3s listening to looking "at a Kandinsky painting with sunglasses on" (Levine 2007). While many other superior formats, such as Apple's mp4, have been introduces in subsequent years, the mp3 remains the format of choice among music listeners possibly because of its universality.

So far, I have tried to summarize the loudness race from the viewpoint of those who are trying to mitigate it or, outright reverse it. As the narrative goes, the culprits driving this race are record producers, recording artists, and recording and mastering engineers who originally wanted their albums to stand out against the competition. After many years of such competition, and because of the misuse of dynamic range compressors and the advent of mp3s, the people who had started the race in the first place now feel that it is spiraling out of control. It is at this point, that I would like to explore other possible concomitant causes that may be responsible for the increasing loudness in

recorded music. I believe that the current narrative, while presenting a compelling case for some of the important causes that have fueled the loudness race, it is also somewhat reductive, insofar as it does not fully address the deep seated and persistent nature of the problem. Individual culpabilities aside, it seems to me that there are larger societal and physiological forces at play that might require an overall rethinking of the way people view technology, as well as the path that Western civilization as a whole has been embarked since the dawn of the Enlightenment. In order to do so, I would like to turn my attention toward the beginning of the 20th century, a time when the recording industry was still in its infancy.

In *Capturing Sound: How Technology Has Changed Music*, Mark Katz shows how recording technology was an important factor in changing the aesthetic of violin playing in the early part of the 20th century. Within a short time frame, the style of violin playing underwent a radical transformation as vibrato technique moved from being an occasional ornamental device to becoming an omnipresent staple of violin performance. In Kats' view, this relatively sudden aesthetic change had been partially induced by the physical limitations of the existing sound recording technologies (2004, 86-7). These limitations were fourfold: "the insensitivity of acoustic horns and the problematic sensitivity of microphones, the enhanced perception of poor intonation, and the lack of the visual element" (97). According to Katz, vibrato technique enabled violinists to overcome these problems by increasing the loudness of the instrument without increasing its scratchiness (which could be picked up by microphones), as well as masking intonation issues and, most importantly, compensate for the lack of visual element. I say

most importantly because the lack of visual element is an essential feature of recorded music and, I might add, radio music broadcasting. In Katz's view, the increased use of vibrato technique was a way for musicians to project emotionally over the new medium. To make his point, he first quotes Robert Schumann writing that Franz Liszt "must be heard – and also seen; for if Liszt played behind the screen, a great deal of poetry would be lost."[11] He then writes:

> In 1993 music psychologist Jane Davidson reported some remarkable findings that confirmed Schumann's conclusion. In an experiment Davidson presented subjects with videotaped musical performances. She did so in three different ways: with the video on but the sound off, with the sound on but the video off, and with both sound *and* video on. Subjects where then asked to describe the performers' level of expressivity, choosing between deadpan, exaggerated, and projected, which is somewhere in between the two extremes. Davidson found that subjects were most accurate in describing the performers' intended level of expressivity simply by watching the performance. That is, subject scored highest when they could not even hear the music. From these results, Davidson concluded that "vision can be far more informative than sound in the perceiver's understanding of the performer's expressive intentions."… One implication of this study is inescapable: listeners lose a good deal of information about the expressive manner of performances they hear on recordings.
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> I suggest that the more frequent and prominent use of vibrato helped violinists communicate to unseeing listeners what their gestures and expressions could not. (Katz 2004, 95-6)

Here I would like to advance my first hypothesis in regard to the origins of the loudness race. Katz's and Davidson's findings suggest that part of the loudness race may be taking place between recorded music and live music. As Katz has shown, the lack of

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[11] Schumann, Robert, Konrad Wolff, and Paul Rosenfeld. *On Music and Musicians*. Berkeley: University of California Press, 1983.

visual element in recorded music prompted musicians to find ways to increase their expressiveness. In a primer on loudness Dave Moulton writes that "loudness management, or *dynamics*, is one of the most important expressive aspects of music" (2003). The example of the increased use of vibrato technique suggests that as the compensatory technique becomes part of the style of playing of the performer, it loses its original compensatory effect. In a sort of vicious circle, as the higher *intensity plateau* in live performance is set, musicians and recording studios will then have to find ways to compensate. As Katz puts it, "necessity, it seems, may sometimes be the mother of aesthetics" and for this reason, "recording is not simply a preservation tool, but a catalyst as well" (2004, 99). This is what Hayles calls reflexivity, or the idea that the observer, the recording machine, has an affect on the observed object, the music (1999, 7-8). The concept of reflexivity could also help explain why the loudness race seems to pick up in intensity whenever advancements in recording technology allow for either greater dynamic range, as it happened with the introduction of the LP and 45s and the compact disc, or when more sophisticated compressors are introduced, as is seems to be the case nowadays. When the limits of a particular technology are eventually reached, like when the Beatles tried to make the vinyl thicker, the loudness race slows down until the next technological advancement comes along. If this is actually what is happening, could the technological advances in regard to extended dynamic range and compressors be seen as a response to a desire to keep increasing loudness? In other words, could technological innovation be actually driven by the need to deliver ever increasing musical intensity rather than for the search of elusive goal of *perfect fidelity*? According to Jonathan

Sterne, the answer to these questions is yes. Technologies, in his view, "are repeatable social, cultural, and material processes crystallized into mechanism, … they embody in physical form particular dispositions and tendencies." In other words, technologies are a reflection of the wishes and desires of the society that creates them. If true, then the reason why there are more sophisticated compressors could be because they satisfy society's wish to keep turning up the volume.

Earlier on, we saw how Sterne believes the whole audiophile approach to be fallacious. Expounding his reasoning further, he writes that "to consider the products of reproduction – original and copy – separate from the process, even in a philosophical exercise, is to confuse a commercially useful representation of reproduction with the ontological character of reproduction itself" (2003, 219). This brings us back to the concept of *fidelity*, which, as we have seen and as Sterne here points out, can be viewed as a marketing ploy, designed to sell more and more sophisticated technology in the perennial search for the *perfect fidelity* Holy Grail.[12] The idea of *fidelity* also brings up the idea of authenticity in recorded music. If *fidelity* is indeed a mirage, then one could say that there is really no such thing as authenticity in recorded music. In fact, in Sterne's view, because authenticity is not reproducible, reproduction "results in the creation of a distinctive form of originality: the possibility of reproduction transforms the practice of production" (2003, 220). In other words recorded music can be seen as an art form onto itself and not as a mere 'reproduction' of a musical performance.

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[12] Anthony Tommasini describes *high fidelity* in such religious terms in a 2007 New York Times article.

In *Faking It: The Quest for Authenticity in Popular Music*, Hugh Barker and Yuval Taylor explore the concept of authenticity in music, by looking at the rise of disco music in the late seventies. In the book, the authors identify German rock band Kraftwerk as the precursors of the genre, as the first band that was able to bypass the issue of authenticity that existed in popular music up to that point. Barker and Taylor write that when an artist becomes well known, s/he has to decide what personality s/he would like to project. The reason for this is that human beings are too complex and multifaceted to be faithfully represented in the media and, for this reason, artists must decide what type of persona they want to project. According to the authors, there are typically two types of responses to this problem: the first is to exaggerate the degree to which the artist is faking their persona; this is the approach that larger-than-life pop artists generally like to adopt. The second type of response is for the artist to pretend that the public persona is the real person; in order to do this, the artist must try to live up to such persona. This latter approach is the one generally chosen by rock artists (2007, 243-5). In regard to disco, Barker and Taylor believe that the artistic aesthetic of Kraftwerk, allowed the band to bypass the whole idea of authenticity. Kraftwerk achieved this by blurring the line between human and machine. Founding member Ralf Hütter once said: "We are playing the machines, the machines play us, it is really the exchange and the friendship we have with the musical machines which makes us build a new music" (241). This postmodernist renunciation of authenticity in order to "build a new music" is, in Barker and Taylor's view, ethos from which disco and dance music in general originated: a music that attracted the kind of people who did not fit into rock's authenticity paradigm and that, for

this reason, were hungry for a style of music that did not ask them for an 'identity card.' In the author's words:

> Where mainstream rock aspired to be authentic, personal, creative, and earnest, disco was theatrical, universal, manufactured, and tongue in cheek. Rock was built around rural, working class values and around the white working class male, while disco was urban, aspirational and multicultural, and expresses gay and female sexuality. Rock emphasized traditional song structures and live instruments; disco was repetitive (often to the point of endlessness) and used machines. (Barker and Taylor 2001, 252)

When artists such as Donald Fagen criticize the way contemporary music sounds by saying that "[w]e're conforming to the way machines pay [sic] music. It's robots' choice. It used to be ladies' choice — now it's robots' choice," he is really voicing the modernist rejection of the postmodern idea that the reproductive medium can also be a means of expression. *Figure 2* shows the wave file of "Dollars And Cents" from Radiohead's 2001 album *Amnesiac*:

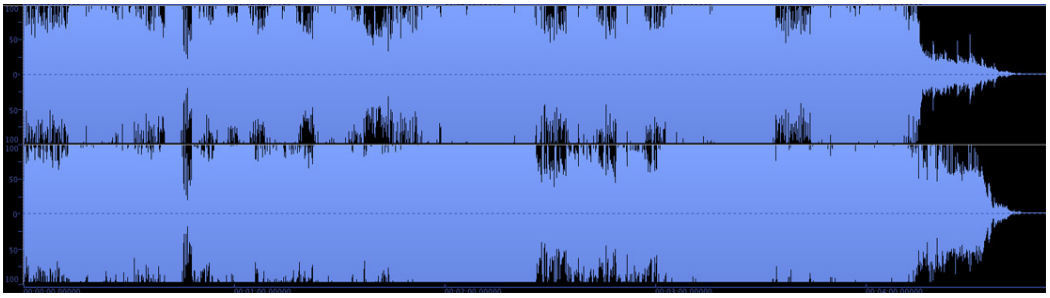

Figure 2. Radiohead, "Dollars And Cents," *Amnesiac*, Capitol Records, 2001.

As we can see, a lot of transient peaks are missing. There is some distortion, specifically in the bass drum, but there is no clipping. But, upon listening, one can also hear that there is a lot of space in the sound of the recording despite the heavy limiting. As a matter of fact, in an essay on the loudness race, Chicago Mastering Service calls the recording "shockingly transparent" and "a remarkably good sounding CD." According to the author, "a very loud but musical sounding master was achieved through a layered approach to compression that probably began during tracking, continued through the mixing, and was finished off in mastering."[13] Mastering can and is a creative process, and so agree even the very mastering engineers who are criticizing the loudness race. When Bob Ludwig says that today's dynamic range compression is "a losing battle for musicality" (Jenkins 2003), he is making a qualitative judgment of what is *musical*. But *musicality* is, by definition, is a highly subjective matter. When the distorted guitar sound first came along in the 1950s, many people hated it, and some even thought there was something wrong with their own equipment. Incidentally, the technical terms used to describe distortion in guitar are the same as those used to describe aggressive dynamic range compression: clipping, saturation, compression, loss of dynamic range. In "Masters on Mastering," Steve Hall is quoted saying that mastering is the art of getting the most of a musical performance, to make it "as musical and exciting to listen as possible." And in order to do so, mastering engineers "have to do all kinds of sonic doctoring." This sounds like the description of a creative process, unlike what Ludwig in the same article calls "an acoustic photograph of an event that actually took place somewhere" (Jenkins 2003). In

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[13] "*Loudness*," Chicago Mastering Service, http://www.chicagomasteringservice.com/loudness.html (accessed August 6, 2010)

the end, this purported realism "is, at its core, a set of arbitrary conventions designed to have a particular aesthetic effect" (Sterne 2003, 242). For this reason, it seems to me that the general criticism of the loudness race, the type which decries a loss of *musicality* in contemporary recording, stems directly from a modernist aesthetic.

From such a perspective, the need to preserve a sense of authenticity at risk of being lost makes perfect sense. But for the postmodernist, authenticity is neither an imperative, nor the first consideration. This is not to say that the postmodernist does not care about authenticity, but, as Grant McCracken writes in *Transformations: Identity Construction in Contemporary Culture*, "the postmodern individual is prepared now to sacrifice authenticity to pursue new possibilities" (2008, 301). The whole *lo-fi* movement, then, makes perfect sense in a posthuman world that "privileges information pattern over material instantiation" (Hayles 1999, 2). For the modernist, on the other hand, the idea of not taking full advantage of "the glorious 90 db or more of dynamic range that digital could provide" "just to be cool" is inexcusable (Graham 1997). But if technology is an expression of society's wishes and desires, the mp3 should then be seen as the realization of the wishes and desires of the posthuman, the modernist's "hell" in which the posthuman, the cyborg, the "illegitimate offspring" of modernism finds refuge (Haraway 1991, 151). And for this reason, the posthuman's embrace of the iPod, "a mercurial device that freely transgresses boundaries," does not come as a surprise (Burton 1999, 5).

If these are indeed the kinds of forces at play, if the emergence of a new posthuman identity is actually dismantling the modernist's notion of authenticity and fidelity, then the type of solutions that are currently being proposed might not prove to be

very effective. So far, the efforts seems largely voluntary, as in the case of Mudcrutcher and of ***Turn Me Up!***™, a non-profit music industry organization which certifies records meeting their dynamic criteria.[14] Perhaps, as the example of Mudcrutcher suggests, there may be two separate markets for which two separate masters could be released: one market being the new generation of modernist audiophiles, and the other being the posthuman iPodders. With a different kind of approach, some in the industry are advocating a more proactive and drastic stance, such as the development and setting of a music industry reference standard similar to the one existing in the film industry, originally proposed and implemented by Dolby's Ioan Allen in the mid 1970s. This is the solution envisioned by mastering engineer Bob Katz of Digital Domain. He has developed a monitoring system called the K-System, which, he hopes will become the "worldwide standard."[15]

According to many of the people cited in this paper, one other reason why songs are getting louder is that society is as a whole getting louder. Mastering engineer Doug Sax blames what Sarah Joes calls "our arguably most popular listening environment," the car, saying that "[t]he biggest virtue of the LP record — and why dynamic range is gone — is that it could not be played in the car." Bob Katz disagrees: he believes that "the dynamic range of many musical recordings has been reduced far beyond what is necessary to make it work in the car, so that particular reason or excuse has long passed"

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[14] The organization's stylized, cyborg-like logo, as depicted on its website, resembles the futuristic aliens in Steven Spielber's 2001 motion picture *A.I.: Artificial Intelligence*, thus suggesting that its target audience is indeed the posthuman.

[15] Bob Katz, "How To Make Better Recordings in the 21st Century: An Integrated Approach to Metering, Monitoring, and Leveling Practices," *Digido.com*, http://www.digido.com/level-practices-part-2-includes-the-k-system.html (accessed August 4, 2010)

(Jones 2005). The iPod, is also singled out. Bob Luwig says that music "is often optimized for play on the relatively low-fidelity earbuds for iPods, reducing incentives to offer a broad dynamic range." It is true that it would be next to impossible to hear a string quartet's triple *piano* passage on a subway platform while listening to an iPod unless that triple piano was compressed up to a *forte*. On the subject of environmental pollution, a 2004 World Health Organization Study concluded: "for chronically strong annoyance a causal chain exists between the three steps health – strong annoyance – increased morbidity."[16] Interestingly, from this perspective the iPod could be seen as a defensive mechanism, a way for people to protect themselves from the increasing assault of environmental noise pollution.

Another societal trend that may be influencing the loudness race as well and help explain the success of the iPod is what George Ritzer and Alan Bryman respectively call the McDonaldization and Disneyization of society. Justin Burton writes that the two theories "wield exceptional explanatory power for the ways corporations have been able to achieve immense success by implementing basic means-end formulae in the pursuit of profit" (Burton 2009, 26). Because of globalization, people in Western societies have had to deal with increased uncertainty. In such a world, the feeling of safety and comfort that can be derived from homogeneity, sameness and predictability can be a very alluring. In a flattening world,[17] where the 'dynamic range' of choice is disappearing along the

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[16] World Health Organization, *WHO LARES Final report: Noise effects and morbidity*, WHO, 2004. http://www.euro.who.int/__data/assets/pdf_file/0015/105144/WHO_Lares.pdf (accessed August 4, 2010)

[17] To use a description coined by one of the main proponents of globalization Thomas Friedman in his 2005 bestselling book *The World Is Flat: A Brief History of the Twenty-First Century*.

interminable aisles of illusory choice of its supermarkets, what kind of art, what kind of music do we expect artists to produce?

In my opinion, the message we should take away from today's extremely saturated music, is that if we really want to turn it down, we must first turn down everything else. When Iggy Pop takes full credit for re-mastering the Stooges' *Raw Power* 1990 album (fig. 3), to a level that is constantly clipping and distorting, isn't he making a political satement?

Figure 3. The Stooges, "Search and Destroy," *Raw Power*, Sony Records, 1997.

In objective terms, this picture is saying that the box is full and there is no more room for growth. In symbolic terms, it could mean that our culture is has reached the limits of distortion, that our society has hit a brick wall and that it may be time for a turn-around, for degrowth.

The increasing flattening of popular music prompts one final question. If, as I believe I have shown, the recorded medium has an impact on the way musicians make music and thus on music itself, and if this is the music that we listen to, what kind of music do we expect to hear 20 or 40 years from now? Could this mean that music has already lost its dynamic range at least for the time being? It goes without saying that the

example of the Stooges is extreme, as the folks at Chicago Mastering Service also point out. But much of the music that is being released today is actually not that far behind.

In this paper, I tried to render a portrait of the loudness race, both from the perspective of those who are fighting it, the liberal humanist subjects, as well as from the perspective of those who do not particularly have a horse in this race, the posthumans, but who by virtue of being on the other side of the modernist fence, are nonetheless part of it. From a posthuman perspective, it is not the technology that we should blame, since technology does what society wants it to do. For this reason, if we don't like the way music sounds, if we think it is too loud, then we should try to change the society that produces it. As Donna Haraway exhorts us in her *Cyborg Manifesto* (1991), instead of fearing technology, we should embrace and use it to change society so that it reflects the type of dynamic range, of diversity, that we would like to see in our music. I believe that once we are able to do that, music, like everything else, will just follow.

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