The kids these days play their music too loud and it all sounds the same. Old fogies familiar with such sentiments will be happy to hear that maths bears them out. An analysis published in *Scientific Reports* by Joan Serrà of the Artificial Intelligence Research Institute in Barcelona and his colleagues has found that music has indeed become both more homogeneous and louder over the decades.

Dr Serrà began with the basic premise that music, like language, can evolve over time, often pulled in different directions by opposing forces. Popular music especially has always prized a degree of conformity—witness the enduring popularity of cover songs and remixes—while at the same time being obsessed with the new. To untangle these factors, Dr Serrà’s team sifted through the Million Song Dataset, run jointly by Columbia University, in New York, and the Echo Nest, an American company, which contains beat-by-beat data on a million Western songs from a variety of popular genres. The researchers focussed on the primary musical qualities of pitch, timbre and loudness, which were available for nearly 0.5m songs released from 1955 to 2010.

They found that music today relies on the same chords as music from the 1950s. Nearly all melodies are composed of ten most popular chords. They follow a similar pattern to written texts, where the most common word occurs roughly twice as often as the second most common, three times as often as the third most common, and so on, a linguistic regularity known as Zipf’s law. What has changed is how the chords are spliced into melodies. In the 1950s many of the less common chords would chime close to one another in the melodic progression. More recently, they have tended to be separated by the more pedestrian chords, leading to a loss of some of the more unusual transitions. Timbre, lent by instrument types and recording techniques, similarly shows signs of narrowing, after peaking in the mid-60s, a phenomenon Dr Serrà attributes to experimentation with electric-guitar sounds by Jimi Hendrix and the like.

What music lost in variety, it has gained in volume. Songs today are on average 9 decibels louder than half a century ago, confirming what industry types have long suspected: that record labels engage in a “loudness race” in order to catch radio
This homogeneity is not just jarring to melomaniacs. It might confuse the popular genres, for instance. Some musicians are bound to respond by confounding other music services. Many of these rely on timbre measurements to sort songs into this homogeneity is not just jarring to melomaniacs. It might confuse the popular genres, for instance. Some musicians are bound to respond by confounding other music services. Many of these rely on timbre measurements to sort songs into this homogeneity is not just jarring to melomaniacs. It might confuse the popular genres, for instance. Some musicians are bound to respond by confounding other music services. Many of these rely on timbre measurements to sort songs into

"Pop music and the Crap-o-Metre", May I suggest another scientific study "Pop music and the Crap-o-Metre", it could be interesting though I suspect that most people over 35 already know the results.

Igor Terrible Aug 2nd, 01:43

"9 dB Louder"...that's only the way the pop.records are produced nowadays...it just means that today's fashion while producing relies on over-compressing the tracks and the master. Nothing else. But that just happens because we have the material to do it (they would have done it before if they had the opportunity), and because of the music bussines, more regulated than ever before.

This also relies on the amplifier and monitoring systems (unexistent for a wider audience during the 50's) that have beeing optimized in power during the last fifty years... (they would have done it before if they had the opportunity), and because of the music business, more regulated than ever before.

EricRM Jul 31st, 12:59

Thank you for putting into words what I've been trying to explain to friends without knowing the technical terminology to back up my hypotheses. I believe I have a critical ear that some others may not possess, as most of my counterparts do not get knowing the technical terminology to back up my hypotheses. I believe I have a critical ear that some others may not possess, as most of my counterparts do not get

Edgy and harsh and boring. I love all types of music, but do not listen to any current music as it is extremely annoying to my senses. Garth Brooks, during a recent interview with Larry King, talked about the same thing and also that it was one of the reasons he has not recorded for a while. It appears he prefers the old recording methods to the "supposedly" better digital sound. We have had the best, so why do the big ego guys think they can make it better. Will they ever figure out what us old fagies have known all along?

nb
For sake of doctor Serrá, he is completely wrong in some aspects. The music of today is not based on the same ten chords...not even the Pop music (depending of what he considers Pop). Arguing with the example of Jimi Hendrix is a clear example of ignorance...there was a time where everything was better is just a simple mistake (and a plain one). The only way he is right is that up to today's satndart, we have more and more more music that seems the same, but only because the musicians have better chances of producing themselves and buying material than before.

There is much more that those ten chords Mr. Serrá, and much more than Stockhausen could have possibly imagined.

Kent Williams, you're correct when you say that the decibel unit is meaningless when used without a reference. However, dB RMS is equally as meaningless. RMS is simply a way to calculate the average level of a signal over time (which contrasts with a peak measurement). It does not provide a reference.
In order to reference the measurement, you need to use a reference measurement like dBV RMS, dBSPL RMS, dBOV RMS, or dBFS RMS.

The author is talking about recording media, so dBSPL, which can only be used in an acoustic system, has no meaning here.

Scotland777, as I mentioned above, dBSPL (sound pressure level) actually has no meaning with regard to audio recordings. dBSPL is a measurement of sound pressure in an actual acoustic listening environment, which means it relies on the speakers, the distance from the listener, the power of the signal through the speaker, and the air through which the acoustic signal propagates. It has no relation to the recording medium.

The measurement referred to in the article is actually dBFS (decibels full scale) in the case of CDs. 0 dBFS (peak) refers to the absolute maximum level that can be represented in the digital recording medium. In analog recording media, the maximum level is 0 dBOV (peak), which refers to the maximum analog level that can be reached without clipping in the electrical domain.

In both cases (analog and digital recording media), what defines "loudness" is the ratio between the average (RMS) level and the peak level of the recorded signal. It's true that this ratio has increased for modern recordings, which conversely decreases the dynamic range of the recording. Metallica's "Death Magnetic" album has one of the lowest dynamic ranges of all time. This is what is commonly referred to as the "loudness war."

I guess you can't blame the author (or the public) for not having a solid understanding of a pretty complex technical concept.

In any case, the author said that the recordings are 9 dB louder. This refers to the crest factor (peak/RMS), which is a power ratio, and our ears distinguish loudness as a power ratio, not a linear ratio. 9 dB equates to a power ratio of 7.9. Basically, it means that music has gotten 7.9 times "louder" in the past 50 years. Another way to think of it is that the dynamic range has decreased by a whopping 88%.

Everything is going to pot. It's all been downhill since Mozart.

As for volume, I talked about this two decades ago on Channel Four: http://youtu.be/BuPSr1syFwk

Dr Serrà's article, and the underlying research, are both nearly harmless nonsense. While there is plenty of evidence indicating that equal loudness has increased significantly since computers began mixing music (q.v. Fletcher-Munson curves), there's zero evidence that a Fourier transform can extract artistic qualities such as "timbre" from a public domain recording.

Just reliably picking out a melody from a recording, via an automated process, is next to impossible. One recent academic paper was overjoyed to report ~60% accuracy in this regard, and that's only for a single melody line. Good luck acquiring meaningful "pitch" and "timbre" data for half a million recordings of every genre, recorded with every conceivable combination of equipment, with every conceivable frequency response.

Given this highly randomized data set, the authors claim to have found "codewords" which are representative of musical styles and periods. The authors acknowledge the novelty of the codeword idea, and have provided no evidence that codewords actually exist, or provide any indication that codewords are useful for psychoacoustic analysis. No composer living or dead has ever considered a codeword while writing a song.
Unfortunately, this article is only mostly harmless. Friedrich Schenker’s school of tonal analysis tried expressly to prove the superiority of German music through complicated tonal analysis. Likewise, the author’s claims of “blockage” and “no-evolution” of modern music should be interpreted entirely as the opinions of the authors and not given any further countenance.

If you think that today’s music hasn’t narrowed in timbre and its attendant recording techniques have been essentially dulled over the last few decades, you are severely out of touch with current popular music and its history. The fact is, whether or not the science is spot-on, this article reflects the current reality of pop music.

But if you admit that the science doesn't necessarily reflect it, then how can you know it as a fact?

Two points:

First, it does not make any sense to say that music is now 9 decibels louder than before. The volume of a song is dependent not just on the recording but the volume the listener plays the music at. If a record company increases the volume, the listener can simply reduce it on his end.

Second, volume levels have lost variation because an increasing proportion of music listeners do so in settings with much ambient noise (e.g. subways, cars or airplanes). One of the biggest challenges of a sound engineer today is to keep the decibel level consistent enough so that if someone were to listen to the song in their car, the volume would not be much that they would have to increase their volume at their soft parts (where the music is easily drowned out by ambient noise) and then turn it down at the loud. Instead, sound engineers strive to maintain decibel levels relatively consistent, but allow variation in texture to achieve variation in PERCEIVED loudness which is the more important aspect. Hence, focusing on decibel levels is almost certainly going to overstate the degree of homogeneity of modern music.

No no, they're talking about the level in which it was recorded to tape (er, to hard drive). And compression plays a large role in this. Think of it like mountains and valleys ... the mountains in most music are the same height, but the valleys, even 10 years ago, were lower ... so there was more dynamic range between, say, a verse and a chorus in the same song. Today, they're slamming everything so hard that they have to compress the tracks harder, thus the valleys end up just as tall as the mountains. What does this mean? There is less and less range in any given song today ... the verses, choruses, the singing ... it's all at a continuous volume. THEN, when it's played on the radio, it gets compressed even more. You should read up on the "volume wars" some time, kind of interesting. Anyway, sorry for so many words, but the author of this article didn't go into the technical aspect as much as they should have to fully explain what it means. Hope I did a reasonable job with the whole mountains and valley thing.

Up until the mid 1990s, outstanding musicians were paid very well, so a lot of studio-recorded music was of very high quality. Now that the value of recorded music has fallen (because youngsters don't pay for it, or spend their money on other things (e.g. video games)), music is not attracting the same quality of people.
There is still a lot of very good music being made - but now that modern electronic keyboards make it so easy to make “music”, it takes a lot of time to sort it from the dross in the long tail. There may be internet radio stations that take the time and trouble to select good new music (good luck finding one!), but the days when you'd hear lots of good new music on free radio, select what you want from among it, and then confidently go out and buy the album have gone.

Our best (only?) hope is the creation of applications that work out your musical taste and then create music for you on the fly.

We do spend our money on music, but not in traditional ways. We don't spend our money on plastic CD's or MP3 files from iTunes, but we do spend our money going to live shows and festivals.

This summer I paid $300 for an admission ticket to a three day festival featuring over 300+ electronic dance music artists.

There is plenty of good music being created, but it is not being played on the radio.

What radio?
Your digital radio stations broadcast compressed crap music. You will never gonna enjoy explosive sounds of drums and base guitars!

CDs, MP3s, iTunes are all craps as well!

Only way you can enjoy real music is to go live band concerts with smallish audiences.

Got louder?
What happened to Deep Purple?
Sound like another wasteful don quijote airport project!

As a matter of fact, music got lighter!
All thanks to the spread of compressed digital sound such as MP3, Dolby Digital, DTS, ipod, digital TV, digital radio, etc.

Sound compression starts from narrowing volume variations. In no way, this will make sound louder! I don't see how this got to do with artificial intelligence. I don't see how artificial intelligence can tell the difference of music.

Simply ridiculous!

I think you are perhaps confusing dynamic range compression with digital (file storage) compression. The latter does not cause the former; it may create other issues but that's different.

sikko, dynamic range compression refers to an audio processing technique that alters the average signal level with regards to the peak. It started out as a purely analog technology back in the 40s with vacuum tubes, and it was used extensively by the Beatles, Hendrix, and yes, even Deep Purple.

The human ear perceives "loudness" as the ratio between the average signal level and the peak level. By increasing this ratio, all other things held equal, your brain will tell you that the sound you're hearing is louder. This is not a subjective test - it is simply the way that the brain works. Side-by-side listening tests have told
record companies that people prefer "louder" music, so mastering engineers have slowly dialed up the ratio over time. This is commonly referred to as the "loudness war."

You seem to be confusing this concept with digital file storage compression (actually, to be precise, "psychoacoustic compression algorithms", such as MP3), which decrease the size of an audio file and can introduce certain audible artifacts as a result.

These are completely separate concepts.

For further reading on this topic, please check the "Psychoacoustics", "Loudness war", "Dynamic range compression", and "Data compression" articles on Wikipedia.

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teacup775 Jul 28th, 05:50

Pop may be so dull because much creative talent has leaked away into other genres and everybody samples everyone else.

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Monboddo Jul 28th, 04:48

This study sounds reasonable on its face but I am guessing that it takes the wrong approach to interpreting pop music. It assumes that harmonic complexity is the sole basis for judging whether a pop song is interesting or not and Dr. Serra is imposing his own values on genres that have given up on harmonic complexity as an area worth exploring. How many flat 13th chords can you have anyways?

I cite Aaliyah's "Are You That Somebody?" (produced by R&B genius Timbaland) as an initial case to show that Dr. Serra's assumptions may not capture the interesting aspects of modern pop music. Does Serra realize that Timbaland takes a page from musique concrete and actually imbeds a sample of a baby gurgling with glee into the song itself?

Official "Are You That Somebody" video on YouTube: http://www.youtube.com/watch?v=GuWMW7hVdTs

Essentially, Dr. Serra is way behind the times--the pop composers are exploring different areas of rhythmic and sonic complexity that he does not even ken let alone measure. Judging from your article, I bet his efforts to explore timbre are not nearly as mature as his tools to explore sonic complexity, given the amount of sheer sonic wonder that you can find in the best pop music.

For example, Donna Summer's classic 1977 electrodisco tune "I Feel Love" should start doubting Dr. Serra instantly:

Unofficial clip: http://www.youtube.com/watch?v=H7r83-y3j2A

(Note: the only official clip is an inferior live version.)

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LexHumana in reply to Monboddo Jul 30th, 16:00

Huh... a baby making gurgling sounds? This is innovative? I think you need to uncork Pink Floyd's "Dark Side of the Moon" and listen from beginning to end, and you will find a remarkable use of spoken voices and sounds of daily life interwoven into the songs as well as in the transitions between songs. Great stuff.

Simon and Garfunkle also had a great album "Bookends", which had a track "Voices of Old People". Side one of the album is about the phases of aging, and the track fits in nicely with the theme (although side two has the more memorable songs on it).

I love it when folks talk about "innovation" before realizing that some artists did the exact same thing 30 or 40 years earlier.

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Monboddo in reply to LexHumana Jul 30th, 16:59

You're spot on about "Dark Side." I'm honestly not a fan of that album so I don't think I even knew they used found sounds on that album. Also, I would not be surprised if the Beatles used similar approaches when they experimented in tape.

However, what is unique about "Are You That Somebody" (and if I recall correctly, "Dark Side") is that the found sounds are part and parcel of the songs themselves.
They are blazing an unusual trail for many musicians employ this technique in mainstream popular music for the following reasons:

1) Until the Akai sampler came into play in the late 80s, sampling found sounds was very complex and either required lots equipment, lots of time, or both. Floyd had all of these things when they did “Dark Side” and only tape-splicing obsessives like John Oswald could offset the cost by sheer dint of effort (and many slashed fingers I presume).

2) The idea of found sounds is still rather unusual in mainstream pop music, even today. I used the Aaliyah track as an extreme example of sonic creativity to make a point. The mega-popularity “Dark Side” is an obvious fluke partly generated by the band's cult following and the pot-influenced legends that sprung up around it.

Even though you are correct about “Dark Side,” that does not make “Are You That Somebody” any less unique to the history surrounding use of found sound in pop music.

By comparing the whole database, I think we're missing an important point. A listener of the 50s--whether the 1750s or the 1950s--had access to only a very small percentage of the music produced.

With the digital world, access to music, and types of music, is much greater. As a college student in the 1970s, I struggled to afford the $6-$8 for a single new vinyl album. And these albums were mostly rock (I was fortunate to have roommates who purchased jazz and classical).

Today, I have most of these vinyl albums in digital. In addition, I have hundreds of other “albums” in digital....in genres that wouldn't have been commonly available or noted in the limited analog age.

Painted with a broad brush the 1950s--or the hits we fondly latch onto--are interesting. Listen to all of the songs on a regular basis, and they also start to sound the same.

And lets not forget to discuss the effect that Apple and Steve Jobs have had in promoting horrible fidelity and music reproduction by choosing and pushing the horrid mp3 format. For this alone, Mr. Jobs can be referred to as the Ray Kroc of the digital age....
Music is relative and subjective. Radio-tunes perhaps have gained in volume, but other genres have explored new ideas. The research is overgeneralizing. Perhaps the research falls into an expectation bias of the researcher.

One needs to be reminded that modern pop music is rebellious, relative to classical music, and is intended to create a large market segment, if not already targeting a niche within that. As a result, it has to be short and catchy. But that's only modern pop.

There are more musicians today than ever, plus more musical collaborations. What defines the decibel a music's range should be?

Rebellious to what? Modern pop music is so mainstream that even older people listen to it. The real rebel will be the one that listens to classical music.

I agree...modern pop is accessible. I am simply pointing out that most modern pop personifies rebellion as a way to entertain - hence, the loud makeup and noise, the simplified chord progressions, the over usage of digital instrumentation, all in order to stand out (to the average consumer).

A listener does not have to be an 'active' listener to enjoy pop music. Whereas to enjoy certain jazz, a listener has to actively find the melody of the solo within the tune.

Besides, I am not suggesting that mainstream music is bad. Again, music is subjective.

This is somewhat off topic, but related. As I move through my Wrinkly years I am less able to hear higher frequencies. I have that annoying "ringing" in my ears. I listen to lots of music, primarily classical, Broadway shows and The Stones. Does anyone make headphones that can cancel out the "ringing" and permit me to hear the high notes?

You should Google 'Tinnitus'.

It is from a lifetime of abusive environmental noise exposure.

Sound canceling headphones generate negative tones to counteract live ambient outside noise.

Tinnitus may be internal noise within the acoustic organ itself.

There may be a headphone frequency that may cancel out your 'ringing'. And it may grant you silence.(A real benefit). But will not likely improve your hearing acuity.

You may try it, some responses may be very individual and subjective. A web forum shows some mixed response:

http://www.actiononhearingloss.org.uk/community/forums/tinnitus.aspx?g=p...
Thanks for the information.

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**Connect The Dots**  Jul 27th, 18:36

The Beatles, Stones and U2 can't touch this:
The UK's Loudest Band for Three Straight Years: SPINAL TAP!!!
They have the courage to bring it to 11---one more in the loudness race.

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**fredigundis**  Jul 27th, 17:18

"What music lost in variety, it has gained in volume."
That's a pretty broad brush you are painting with. I contend that classical music, both recent and remastered, has never sounded better.
Perhaps you are unhappy with the sound given to Lady Gaga and the like. What do you expect from poppy music meant for listening through pea-size earbuds plugged into a phone?

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**falsifypopperism**  Jul 27th, 16:58

All hail Tom Waits. He will continue to be the outlier in the trend until his demise. We could use a heavy dose of 70's British Prog Rock to flatten the progression or someone could reanimate Thelonios Monk. Better yet create some obscure super group with Zombie Monk on piano, Tom on vocals, Robert Fripp on guitar and a heavy dose of Bill Bruford on drums. Modern listeners may not even recognize it as music.

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**LexHumana** in reply to falsifypopperism  Jul 27th, 18:24

"Starless and Bible Black" is one of my closet favorites, but I guess the average listener might not fully appreciate Fripp's viruosity (which is why most of my friends in college would only spin that record if they were high on something). It is a shame, really -- it is extraordinarily complex music, given its genre. It is just not a toe-tapper that the pop masses would appreciate.

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**falsifypopperism** in reply to LexHumana  Jul 27th, 18:56

King Crimson probably has the widest gap of any band if you take Musician's Acclaim-Public's Acclaim. Around 90% of my firends who are musicians would list them as one of their influences(I admit I hang out with a generally eclectic bunch) let alone acknowledge their brilliance. Then you talk to non-musicians and they think you are talking and actual Monarch. Great music though. I seriously considered making Confusion my epitaph for a long time.

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**cyclingscholar**  Jul 27th, 15:35

It would be interesting to follow this article with one about lyrics, important in pop and youth music. The not so slow descent into filth and hate in recent decades should be evident.