

Tuning into Your Noise: Sound for Anxiety

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3 years ago, I asked a group of people to, one by one, enter a dark room with 16 loudspeakers, what I would call a 'sonic womb'. I connected them to a device that resembles a lie detector and fixed a camera to record their facial expressions. I then asked them to listen to the following, and to pay close attention to the sensations they felt and the emotions or memories triggered. Now, let's see what you feel.

Play the sound

At this point, you may be aware of some surprising physical sensations... Blood rushing to your cheeks, dizziness, chills down your spine... or you may be busy wondering: what kind of torture is this? Who am I and what ethics board approved this?

Please, please, allow me to explain myself. When I don't do sonic or psychological research, I am a cello player, and I have always been fascinated by the power of music to trigger a wide range of intense emotions and sensations - awe in orchestral recitals, hedonic bliss in dance clubs, sickening fright watching Japanese horror movies. I have had music pull me out of a debilitating depression and it has helped me induce catharsis - to help me to feel my distress deeply and understand it, so that I can demystify the anxiety and eventually overcome it.

And what is catharsis? In philosophy in psychoanalytic theory, Aristotle and Freud defined Catharsis as the purging of pity and fear, as the shedding of trauma-induced pain: an un-suppressed "energetic reaction" such as uncontrolled tears. Horror or tear jerker movies are one of our most common outlets for catharsis, and music is used for mood regulation by many - if we need to ruminate we might listen to Radiohead, or if we want to feel fragile, angry and eventually empowered, then I recommend Beyonce's Lemonade. This is catharsis - It is what we feel when pain eventually goes away through the release of tension and coming to terms with grievances.

If we refuse to acknowledge our pain or give ourselves time to grieve, reach catharsis, we are susceptible to Post-Traumatic Stress Disorder, a fragile, volatile state where intrusive memories randomly burst into our consciousness often triggered by sounds. So if the trauma is not fully processed, if we distract ourselves from the pain, delaying a catharsis this can cause a more prolonged harm, a slow burn of anxiety and depression.

Today I would like to tell you about a new way in which you can use music for therapy - to trigger catharsis and to better understand and live with anxiety."

You may already retreat away from city noise or tune out your colleague's chatter by plugging in your headphones, with a "chill" playlist at the ready. The reason for why we do this is so that we can control our sound environment - but this makes out that the everyday soundscape be seen as ugly or anxiety-inducing, something to be blocked out.

Rather than "chill out" my most transformative playlist is called "Fierce" which features high energy, emotionally intense power ballads (Beyonce, Queen, RuPaul, even Bond themes) or the noisy drone and abrasive techno metal hybrids - these musics are all hyperbolic, and synthetically induce exaggerated emotion at times when I am unsettled or numb. Maybe you listen to Adele when you need to cry it out, or Philip Glass when you study.

Music and sound has been used manipulatively for millennia, to ensure social cohesion and to elicit religious awe in the hymns of churches or the prayer calls emanating from mosques. However sound is also essential for capitalism -used to sell us products (Like perfume advertisements using sensuous eroticized breaths and hypnotic music) or to make us empathise with a fictional character. (In mainstream narratives, frightening sound effects convey a fatal threat to the characters (gunshots, a tiger snarling, lightning strikes) and musical scores with pounding heartbeats and breathy string instruments remind us of the characters and our own our body's fragility. These are tropes implemented by sound designers for horror films and video games.)

Therapists know it too, that sound can be used to frighten - veterans might play a visual virtual reality game to re-experience a traumatizing combat scenario, usually with a few gunshots but rarely with sound as the focus.

Therapists also use sound to heal, in palliative care - Arvo Part's Tabula Rasa has been requested by terminal AIDS patients.

Now- what is an emotion? What you felt earlier, as you listened to the soundscape, is caused by your heartbeat clocking into the rhythms you hear, intakes of breath in response to confusing or shocking sounds and a rapid cascade of neurochemicals (mostly adrenaline, also cortisol and strangely enough dopamine, one which is usually associated with the brain's reward system – prolactin is a soothing neurochemical induced by sad music).

Your body may have involuntarily triggered a fight or flight response, first evolved when humans fended for themselves in the wild, and they had to decide whether to fight or flee from a fatal threat – perhaps even triggered by the sound of a branch snapping revealing an approaching predator.

Even when there are no drastic traumatic events in our lives we catastrophize everyday stresses if we do not take the time to press pause – to process unresolved anxiety

Some sounds trigger instinctive reactions whereas others are learned, conditioned responses. An example of an automatic response is how the high frequencies nails scraping on a chalkboard activates the brainstem and makes our toes curl, or a loud shock sound following a silence makes us jump.

However we each carry a collection of personally resonant sounds, with learned associations. In my experiment a participant re-imagined her memory of a childhood house fire when they heard the sound of flames raging and another felt a pain in their ankle where stitches were removed upon hearing the sound of scissors snipping. Even if the sound itself might not be particularly abrasive, but we can easily be conditioned to react both mentally and physically to a seemingly innocuous sound. For example we might be conditioned to associate the sound of a slamming door with an intensely upsetting argument, or the whizzing of bike wheels with the approach of a mugger, like Pavlov's dog associating the bells sound with the arrival of its food which causes him to drool even when heard independently . So every time we hear the sound of slamming doors we might get an intrusive upsetting memory – unless we desensitize ourselves to it, through repetition of the sounds and pairing with counter-conditioning pleasant, harmonious music.

The soundscape exposure experience was designed let the participant tune into their own emotions - the persistent instruction for the participant to evaluate the strength of each of their reactions after each soundscape encourages a psychoeducation, a reminder that anxiety is temporary - our emotional state is easily influenced and as fleetingly as anxiety can be induced it can recede, even replaced by bliss. The environment as a whole is unique - an extended 2 hour session in which the participants listened attentively in “ nervous expectation/anticipation, wondering what would happen next, surrendering to the unknown” – no screens, no distractions, no interruptions – just the sounds and their reactions.

You might wonder, surely this has been done before? Indeed there are numerous exposure therapies, such as visual virtual reality games or augmented reality holograms of phobias, or even where a social anxiety sufferer is taken to a shopping centre with their therapist. However there is a lack of purely sound based exposure therapy, especially one which immerses the listener in an constantly moving womb of real world sounds expertly blended with emotionally manipulative music. Sonic or music therapy is mostly for distraction or used as a painkiller.

However, if an anxiety sufferer uses calming music to distract themselves from a panic attack, this only works as a temporary pacifier, and perpetuates the cyclical fear of fear, catastrophizing these anxiety symptoms. Rather than using sound to numb pain or distract I actually took the **opposite approach** inducing temporary discomfort for a positive impact further down the line.

I decided make a lot of work for myself to construct my own soundscapes and lock myself in a dark windowless soundlab for 6 months, panning each individual sound around the room.

“I collected many sounds, recording in diverse locales from vibrant natural sounds waterfalls and geysirs in Iceland to densely populated ambiences in New York. I combed through entire sound libraries to extract anxiety-eliciting sounds that were outwith my reach such as the gunshots and factory mechanisms. I also commissioned bespoke vocal performances and composing both cello and synthesized instrumentation. I even recorded a Japanese Butoh dancer to scream and release terrifying groans under a huge bridge, which certainly gave a few cyclists and dogwalkers a fright.

To make these soundscapes even more unsettling I panning the sounds around the room, veering between realism and hyperreality:
displacing the height of a sound event to induce vertigo
making the listener feel small, by enlarging sound sources usually lower to the ground, e.g. a dog barking could emerge from above
making a listener feel crept up on, by sending footsteps from the rear
simulating absurd scenarios such as the listener standing in a hot frying pan, by placing the sound of oil bubbling at the listener’s feet”

I used questionnaires to track participants’ subjective emotional responses - But what if participants might not remember every sound that triggered an emotion or sensation? Well, remember that device resembling a “lie detector”? Sensors map spikes in sweat secretion, gasps or pauses in breathing rates and rises in pulse rates onto the timeline of the soundscapes to identify the most potent sounds.

So what happened to the participants?

Did people feel better emotionally? Not immediately. Negative emotions increased by 4% immediately after hearing the soundscapes, as one would expect given the intensity of the sensations triggered and vivid memories recalled upon immediately hearing the sounds. But after participants were given time to recharge, move on from their catharsis, and put the psychoeducation into practice for a week, negative emotions dropped by 12% from their original evaluation of emotions one month before the experiment. So, the long term benefit greatly outweighed the minor short term emotional distress.

The physiological data provided clear evidence of desensitization – the number of peaks in sweat secretion decreased by 25% on average by the time listeners reached the third soundscape.

Four participants explicitly reported “a sense of resolution of underlying fear, trauma or grief as a result of the soundscape exposure” – essentially they had experienced a catharsis. Tears were triggered on several occasions including when hospital sounds imaginatively launched a participant back to the ward where their grandparent passed away. When hundreds of sounds are layered, there is a high chance that at least a few would resonate with each participant’s personal histories.

Unsurprisingly, sounds like machine guns and other loud shock sounds triggered negative feelings the most whilst Music and pleasant relaxing sounds such as rainfall were also frequently reported, in a more positive light.

A positive reflection on the unique approach of soundscape exposure as a passive, meditative experience rather than the social pressure of having to verbalise ambiguous emotions in talk therapy:

Often talking to people about themes of grief can involve judgement, whereas with sound that is absent, which makes it easier / safer.)

Remember the physical sensations from the fight or flight response? Blood rushing to your cheeks, dizziness, , chills down your spine? Chills down the spine can be triggered by both musical bliss or high pitched abrasive sounds – the same sensation can be caused by either a positive or negative stimulus. There are anxiety symptoms which can be perceived as positive. But even if these anxiety symptoms are surprising or distressing in our everyday experience, they are vital, our body’s way of telling us something needs to change – we need to press pause, stop running away from unresolved traumas and uncomfortable emotions to confront our fears. Sometimes we need help to feel more deeply, and immersive soundscapes fused with emotionally manipulative music can provide this kick

I'm going to say something which may seem like a grim conclusion: no-one can ever be cured from anxiety: its an instinct that keeps us alive. What we can do however is educate ourselves about the benefits of emotional immersion, to understand our anxiety and learn from it, to improve our lives and discover just how resilient we can be.

So if you are currently lost in a monotonous looping cycle of anxiety or depression, instead of tuning out, why tune into the noise, and even amplify it - so you can understand it better. The effects may surprise you.