

# The Science of Sound

An amazingly creative use of sound and smell-Dunkin Donuts:  
[http://www.youtube.com/watch?v=kmrc8ZJld8A&safety\\_mode=true&persist\\_safety\\_mode=1&safe=active](http://www.youtube.com/watch?v=kmrc8ZJld8A&safety_mode=true&persist_safety_mode=1&safe=active)

**CANNES, France—Ad agency Talent in São Paulo, Brazil, won the Grand Prix in the Radio Lions contest here tonight for something more deliciously devious than a straightforward radio ad campaign.**

**On behalf of Go Outside magazine, the agency dreamed up the unlikely idea of turning an ordinary FM radio broadcast into de facto mosquito repellent. It worked like this: From 6 p.m. to 8 p.m. every night for three weeks, the agency had a local radio station add a 15 kHz frequency sound to its normal music programming. That tone is all but inaudible to humans—but to mosquitos it sounds uncomfortably like a dragonfly, one of its natural enemies. Thus, the pests stayed well away from the radios, allowing Go Outside's readers to, well, go outside**

**7/12 New research shows radio commercials are having an impact between the ears.** Theater of the mind has long been one of radio's most powerful weapons, but a new study conducted by Critical Mass Media for Katz Marketing Solutions takes that notion several steps further. It finds that "sonic branding" has an emotional and visual response on listeners, who often are able to link a radio spot to a brand by sound before the first word is even uttered. "It's just amazing what a second or two of audio can do to generate in terms of emotions and feelings," Katz Marketing Solutions president Bob McCurdy says. The 1.7-second gong of the Taco Bell ad brought images of chalupas and the restaurant's roadside sign to participant's minds at the same time it made them hungry. Similar results were seen for McDonald's and Little Caesar's commercials. McCurdy says that 40% of the people who heard a food ad actually reported being hungry. "Sound can impact you physiologically," he says.

“If you are an advertiser and there are key periods of consumption throughout the day, it is a perfect justification to go out and heavy up in those key periods of consumption and use radio.” The study tested sonic brands from a wide range of marketers, from Mazda to Old Spice and from Pillsbury to Duracell. It’s not all sound effects, however. The three-second “More Saving, More Doing” audio branding of Home Depot had people seeing orange aprons and thinking of weekend chores — exactly what the retailer wanted. In another case it was just the sound of Geico’s spokes-gecko’s voice that resonated. McCurdy sees the research as a tool to help radio sell itself to marketers. “Once an advertiser has an audio signature that is established, it is easy to shift money into radio,” he explains. “It is more efficient and they still get the visual part of it — in a few seconds the message registers.” Katz is looking at expanding the research, which is part of a larger effort at the rep firm to give advertisers ways to quantify the power of sound and connect it to the listening habits of consumers. McCurdy believes the results are applicable to advertisers on a local market level as well, noting the firm often suggests that clients have a consistent audio environment from TV to radio. The online study of 250 respondents tested 24 brands in all. See how people reacted to each of the commercials [HERE](#).

Check this out: very interesting. Discusses 4 ways sound impacts us:

<http://exp.lore.com/post/21208635527/soundcloud-explores-the-four-effects-sound-has-on>

## **Social TV Keeps Viewers Engaged When Minds Might Wander, Study Says**

## Second Screen Helps Hold Viewers' Attention

By: [Mallory Russell](#) Published: [July 03, 2012](#)

**Even when viewers turn to social media during commercials, the study suggested that they still pay attention to the TV -- sometimes more than they think. Eye-tracking results revealed that viewers responded to audio cues, for example, both on the shows and during commercial breaks. (COMMENT- KIND OF AUDIO SOUND BITES. ILLUSTRATES THE POWER OF SOUND TO COMMAND AND FOCUS ATTENTION)**

*The whir of a fan at night ... The rev of a starting engine ... Your sister's laugh ... The sound of your father's steps on the stairs*

These make up the soundtrack to our lives, as much, if not more so, than our favorite songs. They orient us to the things we remember, the people we love and the experiences that have defined us. They are part of a language that we never forget.

Like it or not, brands are as much a part of our life's landscape as anything else. Our memories of our grandmothers are linked to the Oreos they fed us on holidays. There are certain airlines that will always make us think of coming home. A particular Gap shirt reminds us of that guy/girl we fell in love with one hot summer in July.

When we think about these brands, we usually think of the product or the service -- the color of the Coke can, the taste of a Peep, the feel of the airplane seat against the back of your legs. What we don't think of as readily, but what is also always present, is the sound of the brand. **The song from that iconic Pepsi commercial, the pinging sound your Mac makes as it fires up, the clicking of the blinker on your old Ford as you signal right. These are equally, if not more important, than the visual cues that usually come to mind first.**

There are a small number agencies in the marketing world that work or even dabble in the business of sound. One of few that does, and arguably one of the best, is [MassiveMusic](#). More than 10 years ago, this agency had its genesis at Cannes, after the repeated success of its opening night party. It is now one of the most coveted events of

the week. The agency also usually take home a few awards. This year MassiveMusic is entered in Film Craft for Best Use of Music for Fiat "Get Ready," as well as Sound Design and Editing. It also worked on a [beautiful film](#) with Fitzgerald & Co for Bulwark titled 451°, which is entered in several categories.

What's interesting about the agency is that it has found incredible success in something we often overlook. Yes, it matters what something looks like and feels like, but just as importantly, it matters what it sounds like. As Elijah Torn, their creative director describes it,

"Sound is such an important aspect of all of our lives. This becomes even more apparent as everything in our lives is becoming digital. Shutter sounds on digital cameras let us know that our memories are being captured even though there isn't a mechanical connection. Certain frequencies -- such as that of the human voice can resonate more deeply and convey their message more clearly. With music we can have an enhanced memory recall -- music puts us in a specific place. Tying the proper music and sound design to a brand can then extend this into our daily lives. Instead of only being thirty seconds of someone's daily life from a web or television commercial, you create a sense of familiarity, comfort and of course a direct memory." This "sonic branding" reminds us of the importance of sound. A sense that we can sometimes forget about when we are so caught up in the acts of seeing and feeling. Hearing is hard-wired to our emotions and sound can allow us to experience things with a depth that wouldn't otherwise be present. Just imagine a day at the sea without the music of the waves hitting the shore. What would it be like to be more conscious and connected to the things we hear? Maybe we should all try it out. At some point today stop what we are doing, the same way we would pause to take in a view, and just...listen.

**Follow Sarah Hall on Twitter: [www.twitter.com/sarahh314](http://www.twitter.com/sarahh314)**

Check out these links to learn more about Sound:

This video is amazing. A blind young man sees with sound:

<http://www.youtube.com/watch?v=qLziFMF4DHA>

Click on below to see how sound can impact your perception of something innocent and funny:

[http://www.youtube.com/watch?v=2T5\\_0AGdFic&NR=1&safety\\_mode=true&persist\\_safety\\_mode=1](http://www.youtube.com/watch?v=2T5_0AGdFic&NR=1&safety_mode=true&persist_safety_mode=1) SCARY MARY

Julian Treasure: The 4 ways sound affects us:

[http://www.ted.com/talks/lang/en/julian\\_treasure\\_the\\_4\\_ways\\_sound\\_affects\\_us.html](http://www.ted.com/talks/lang/en/julian_treasure_the_4_ways_sound_affects_us.html)

Check this out- how a musical staircase alters behaviour:

<http://www.youtube.com/watch?v=2IXh2n0aPyw>

Check this out- How sound alters behaviour in a park:

<http://www.youtube.com/watch?v=cbEKAwCoCKw>

In This Clip Martin Lindstrom illustrates how effectively kids can identify an advertiser via and audio signature or the sound of the product:

<http://www.martinlindstrom.com/nbc-today-show-kids-inc-part-2/>

This clip from MassiveMusic nails the importance of an audio signature/sonic branding

<http://www.youtube.com/watch?v=VuMorarsTZw>

What images come to mind after hearing the following.....reading is really hearing...it is one part of your brain talking to another part of your brain:

TV/Movies - "Here's Johnny"; Houston, we have a problem; "I see dead people"; "I'll Be Back"; "You Can't Handle the Truth"; "Yeah, I can fly (Ironman)"; "Your Fired"; "Doah"; 60 minutes stopwatch; "The tribe has spoken"; "Book Em, Danno";

Music - Theme from ET; Jaws; the "chime sound" from Law and Order (when it switches each scene - this is a good one); Theme

song from The Office; Theme from Friends; theme from American Idol; Jeopardy music; Glee - Ending credits/theme song.

**What you hear can be more unsettling than what you see.** Award winning director M. Night Shyamalan got the rating of his movie "The Village" changed from R to PG simply by eliminating **one sound**. Not one of his movies have been rated R

Open up a Coke or Beer with no sound....Would it taste right?"If you have the specific sound you "know" when you open this bottle you will already be happy before tasting the product itself," said Brigitte Schulte-Fortkamp, who teaches **psychoacoustics** at Berlin's Technical University. "It's not really a conscious process. You are influenced without knowing it." When a soft-drink aficionado opens his beverage of choice, **he is conditioned to expect the crisp sound of unleashed carbonation; he associates that sound with freshness and satisfaction-**

Vera Brandes- music pharmacologist-Like apothecaries of old, who distilled extracts from nature's store of herbs and plants, Ms. Brandes and her associates analyze music of all kinds to tease out its "active ingredients," which are then blended and balanced into medicinal compounds. Though they steer clear of gross pathologies or infectious diseases, they claim their methods have broad application in psychosomatic disorders, pain management and what Ms. Brandes calls "diseases of civilization": anxiety, depression, insomnia and certain types of arrhythmia.

The pharmacopeia stands at about 55 tracks of medicinal music, with more in the pipeline.

**Neuromarketing's raison d'être derives from the fact that the brain expends only 2 percent of its energy on conscious activity, with the rest devoted largely to unconscious processing. Thus, neuromarketers believe, traditional market research methods — like consumer surveys and focus groups — are inherently inaccurate**

because the participants can never articulate the unconscious impressions that whet their appetites for certain products

The Robert Wood Johnson Foundation released a study report in June 2004 showing that improving building design and **reducing noise in hospitals can help boost healing**. The study also showed that loud paging systems and beeping medical devices interfere with workers' satisfaction levels, reduce productivity and increase accidents.

Royal Air Maroc's sound identity had to convey the five core values of the airlines, which are Moroccan, majestic, magical, maternal and modern, while respecting the oriental roots of the company and being strongly oriented to the future. The goal of this new identity was triple-fold: to better differentiate the airline, express its values, and reinforce the impact of its communication

In addition to influencing our mood by making us feel energized or sleepy, happy or sad, **sound has an amazing ability to inspire us and remind us of the past. Psychological studies have shown that humans strongly associate sounds with a particular memory. Thus, sound has this unique power to recall certain experiences, which is a crucial advantage when it comes to building a strong brand in the minds of consumers.**

EVP Chief Creative Officer R/GA Nick Law: I think sound as branding is incredibly important when it comes to these behaviors that I was talking about. Content now so often has an interface in front of it. So our relationship with content is through interface, and interfaces work better when they're visceral. That's why Apple has taken the time to brand all of these sounds, these functional sounds. I don't think many companies are using sound in as sophisticated of a way as they could be.

Both McDonalds and Coke have made extremely good use of their embedded brand mnemonics, and **Dunkin' Donuts recently combined smell (the aroma of coffee shot from an atomizer) with sound (the atomizer was actually triggered by a sonic signal sent from the brand's jingle) on public buses.** Sales shot up as a result. The Hamburg Philharmonic created an audio logo patterned

after the image of a “waveform” that resulted in looking at the combination of the city skyline and its resulting reflection in Alster Lake, while Audi is working on a branded sound for their e-tron.

With its customized music set from The Playlist Generation, The Coffee Bean & Tea Leaf® is engaging with its loyal customers on a whole new level. "We are fully focused on enhancing every aspect of our customer experience," said Mel Elias, President and CEO, The Coffee Bean & Tea Leaf®. "The Playlist Generation has truly translated our brand into a distinct sound for our stores which has resulted in a phenomenal response from our customers and our Team Members."

Michael Smith, CEO, The Playlist Generation, stated, "With their unique Sonic Identity, The Coffee Bean & Tea Leaf® is differentiated from the generic coffeehouse sound and has created a platform

- It seems it's not only humans who can benefit from music therapy: a Tuscan wine grower has found his vines responding to the sounds of Mozart, Beethoven, Vivaldi and Mahler.
- When Carlo Cignozzi began restoring a Montalcino farmhouse and planting a new vineyard called Al Paradisio di Frassina, he intuitively felt that playing music to the vines would benefit their growth. His early efforts attracted the attention of Amir Bose, who personally supplied the large network of weather resistant loudspeakers required to cover the whole vineyard. Researchers from the university of Florence have since been applying academic rigour to test the theory with both on field and laboratory studies. These have focused on the positive effects sound waves have on the vine's root system, leaves and flowers and the negative effect they have on parasites and predators of wine grapes. Cignozzi is adamant that the grapes closest to the loudspeakers ripen fastest.
- Around 56 loudspeakers play classical music day and night and Carlo has named a Brunello wine Flauto Magico (The Magic Flute) in recognition of it being the first wine ever to be grown “completely in tune with Mozart's musical harmonies”.
- Carlo believes his experiments have given a new “dynamic impulse” to organic farming methods. “Although experiments are still in their early stages the results so far are very encouraging,” he says.



**Companies are starting to engineer foods that taste better by appealing to the eyes and ears**, for instance. The work may even have implications for medicine — helping to explain, say, how the brain can compensate for a missing sense — and for education.

Scott King, part of a UK company called Condiment Junkie that creates sounds to enhance products and events, says that recruiting multiple senses works best when “one sense is choreographed with another in a way that has an effect greater than the sum of its parts.” The company has worked with Fat Duck restaurant in Bray, England, run by celebrity chef Heston Blumenthal, to develop soundtracks to bring out specific flavors in the food, based on their finding that hearing certain sounds (high tones, tinkling pianos) make people perceive a bittersweet toffee as more sweet, while hearing low-pitched tones and trombones make the toffee taste more bitter.

ULABY: Director Michel Hazanavicius thinks every director secretly yearns to make a silent film. It's cinematic storytelling at its purest. And **"The Artist" is immersive in the same way great radio can be. There's a sense missing. Your brain fills it in.**

HAZANAVICIUS: **So you do it with your own imagination, with your own ghosts, your own life, your own sounds, your own reference. So it makes the movie much more yours in a way.**

ULABY: **I saw "The Artist" with someone who swore later he could remember what the actors sounded like.** The film is critically adored. It's a smash in France and the lead won the best actor award at the Cannes Film Festival. Still...

With the marketing world's emphasis on creating strong brand experiences, combined with a rapidly fragmenting media world, it is not surprising that smart marketers are looking at new ways to improve messaging, enhance recall and make better connections with consumers.

Music can do all that, and when used in more creative, insightful and strategic ways, it can be an incredible branding tool.

Let's try an exercise involving movie soundtracks. Close your eyes and recall the Harry Potter theme song. Now recall the James Bond theme. Do the same for Star Wars, 2001, Chariots of Fire, The Exorcist and Jaws. If you are at all sentient, you're probably getting an image with each bit of music, not to mention twinges of magic and mystery, intrigue and danger, awe, hopefulness, fear and maybe even mild panic with the Jaws theme that kept people out of the water for a decade.

See what is happening here? You are triggering visual memories and raw emotions by merely thinking about a piece of music. If you were actually hearing the music as well, you'd be experiencing that even more intensely.

Elizabeth Loftus of the University of Washington:

In many ways the ear is superior to the eye. What I mean by that is that there is evidence from controlled laboratory studies that show when you present a list of words to people and you present either auditorily, say on a tape recorder, or you present it visually, say on slides, people remember more words if they hear the words than if they see them.

In order to understand why, you have to realize there are essentially two kinds of memory. There is the iconic memory which stores visual images and the echoic memory which stores auditory images. When the eye see some picture or takes in some visual information, a fairly complete image registers itself in iconic memory., but it fades away fairly quickly, on the order of say a second or so. However when the ear takes in information, it too, registers a fairly complete image but it fades away more slowly, say on the order of 4 or 5 seconds.

**The power of the spoken word never really stops. There is an important study that shows that even when people were anesthetized during surgery, if they are hypnotized later, can remember some of the things that were spoken, some of the sounds they heard during surgery.**

A study from Northwestern University shows that if you try to convince people about a product- it happened to be a shampoo- and you do it with just a verbal message, people are much more persuaded about your product. They like it better, they want to buy it more than if you accompany those verbal images with pictures. The verbal message alone seems to create in people's minds more of a positive feeling for this product.

Listening to a message is much more effective than reading it. Two things are different. First the mind holds spoken words in mental storage much longer enabling you to follow the train of thought with greater clarity. And second, the tone of the human voice gives the words emotional impact that no picture can achieve.

But there are other things that happen in your mind when you listen to the spoken word

Sticht: we conducted research for the U.S. Army in which we presented a speech without any tone to it and found that comprehension and learning were very poor. When we added natural inflection and intonation, then comprehension and learning were greatly improved.

The relationship between the two kinds of words may be of interest to you. We found that written language is recorded by the mind back into an internal form of oral language. Your mind apparently translates printed words into their spoken equivalents before the mind can understand them.

That format is verbally driven and rarely contains any visual distractions. People don't rave about their commercials. They just remember them.

"Never go to sleep without a request to your subconscious." –  
Thomas Edison

**Your subconscious loves to do work while your body performs other tasks that are easy. I can prove this very easily by asking you how many good ideas you have had while driving or in the shower. When you are relaxed yet slightly distracted, your mind is often at its best.**

Charles Spence, from Oxford University, UK, walked away with the Nutrition Prize for showing how the way foods taste is affected by how they sound.

"When you play the sound of crisps when people bite into Pringles - if we change the sound as they eat, we can actually change how fresh, or how crisp, the Pringle tastes to people," he told BBC News.

"We've used [a bacon sizzling] sound to flip the flavour of bacon and egg ice cream. If we play that sound over the loudspeakers in the room, the ice cream will taste more 'bacony' than if you play the sound of, say, farmyard chickens."

Why Recall Studies are limited in their usefulness:

Neurologist Richard Cytowic says, "Not everything we are capable of knowing and doing is accessible to, or expressible in, language. This means that some of our personal knowledge is off limits even to our own inner thoughts! Perhaps this is why humans are so often at odds with themselves, because there is more going on in our minds than we can ever consciously know."

**Psychologist Carl Jung compared this "unconscious" to swimming in the silent and weightless world underwater: above the waterline exists the sunlit world of the conscious mind filled with air, birds, trees and people. But below the waterline, in the unconscious mind, is a timeless world of twilight and shadows, symbols and beauty, metaphors and music.**

Visit this website for some terrific information re how sound impacts what we see, feel and purchase:

[WWW.CSGAUDIO.COM/POWEROFSOUND](http://WWW.CSGAUDIO.COM/POWEROFSOUND)

Check out these two links: the first one confirms the power of an audio logo to penetrate society. The other one is just plain funny.

<http://youtu.be/P-rGG5jJyd4>

<http://www.guitarpee.com/>

## **Tweets On Steroids!?**

Short. Quick-hitting. Impactful. Not the 140-character kind but that of sound. Several seconds of an “audio tweet” can carry quite a punch as well.

“If you have consumers who are snacking on short amounts of time with different types of media channels, we have to think about how to communicate in short, ‘snack-like’ bits of messaging,” Unilever’s Patti Wakeling, Global Director of Media Insights recently stated in an industry trade magazine. The effective use of audio might just be the right recipe.

Audio, even just a few seconds of it, can powerfully and quickly bring to mind detailed brand messaging and emotions. Everyone’s aware of the usual audio branding examples of the “Intel Inside” campaign, the NBC chime or McDonald’s “I’m Lovin It.”

We at Katz Marketing Solutions wanted to learn more and dig deeper, going beyond just ‘awareness’, to quantify the impact of sonic brands of the top U.S. advertisers. So we commissioned a study to determine the impact of various advertisers’ “audio” snippets, whether it’s an audio logo, music used in the commercial or the voice of a “spokesperson”. The methodology was quite simple: play a short audio snippet, ask a few questions and have the participants jot down verbatim answers.

The goal was to quantify both the ability of these audio sound bites to communicate a brand message and generate emotion. Many of the previous studies on the subject focused on brand identification. We wanted to take it a step further and quantify the emotions that surfaced after exposure.

The following summarizes the findings from two of the 24 sounds tested. Both were from the fast food category but similar results were uncovered for all product categories tested. Two hundred-fifty respondents were asked to answer three key questions. The results confirmed the incredible power of audio.

**Question #1:** *Do you know the company or brand that uses this sound in its advertising?*

QSR #1: 75% correctly identified the advertiser unaided

QSR #2: 86% correctly identified the advertiser unaided

What was particularly surprising was the lack of misattribution.

**Question #2:** *What message comes to mind when you hear this sound?*

QSR #1: 65% provided some advertiser specific commercial messaging

QSR #2: 83% provided some advertiser specific commercial messaging

**Question #2 Verbatims:**

“That there are other fast food choices besides hamburger places.”

“To get tacos instead of hamburgers.”

“I think of hot and ready pizza. The company is trying to tell me i can always get my pizza hot and ready from them.”

“Pizza is yummy, their pizza is the best.”

“Reliable fast food restaurant where you get the foods you love to eat.”

**Question #3** *What pops in your head when you hear this sound? How does it make you feel?*

“Hunger” was the most evident response when consumers were exposed to these fast food audio clips. It incited a craving desire to eat:

“I can go for a taco and it made me hungry.”

“Burritos and tacos. Makes me wanna eat.”

“Makes me feel like trying something new.”

“Makes me hungry for pizza.”

“Hungry! I love their delicious food and cheap prices!”

“It makes me want to eat their pizza... I used to eat it all the time in college and now i want one now.”

“Makes me want their breadsticks which are amazing.”

“Happy and hungry.”

“Want pizza.”

“Crave pizza.”

“Hungry.”

“Fast food, hungry.”

“Tacos. I get hungry.”

“I can go for a taco and it made me hungry.”

“Hungry, yummy food.”

It is important to note that there was absolutely no prompting of any kind.

Also impressive was the fact that many of the respondents referenced in detailed fashion either the advertiser’s spokesperson’s

attire/appearance, their feelings toward them or jotted down the advertiser's exact slogan, which was not present in the tested audio snippet.

It's all too often forgotten or overlooked that audio can very effectively trigger brand messaging, elicit an emotional response to the point of impacting us physiologically while positively impacting several key branding metrics: awareness, intent and affinity. This study is a powerful reminder of how even one or two seconds of audio can trigger brand messaging and explicit visual images, providing an advertiser with the benefit of the visual at audio prices. Radio anyone?

Check out the results of the entire study at [www.sonicbrandstudy.com](http://www.sonicbrandstudy.com)

*-- Bob McCurdy is the President of Katz Marketing Solutions, the national marketing unit of the Katz Media Group, a division of Clear Channel Communications. Bob can be reached at [bob.mccurdy@katz-media.com](mailto:bob.mccurdy@katz-media.com).*

## **NASA heads to a lab in Minnesota to put astronauts through acoustic torture tests**

*By Mike Wehner, [Tecca](#)*

If you've been to a crowded airport, sporting event, or even a kid's birthday party lately, a little peace and quiet might sound like the perfect thing to help you kick back and relax. **Just don't let things get too quiet, or you might drive yourself a wee bit insane:** the [anechoic chamber](#) at [Orfield Laboratories](#) in Minnesota can mute 99.99% of all sound, but visiting the silent oasis isn't as calming as you might expect.

The room holds the current Guinness World Record as the quietest place on the planet, and companies from all over the world seek out its unique acoustic properties. The walls of the chamber are lined with sound-absorbing baffles that can capture noise and mute it in an



instant. This allows companies — both Whirlpool and Harley-Davidson have visited — to test just how noisy their products are without the risk of outside interference.

But while the super-silent oasis is a great testbed for various products, it holds a darker side: **silence, it turns out, can put a great strain on the human brain**. Researchers at [NASA](#) test the room's unique acoustic capabilities on humans rather than hardware. The noiselessness is used to simulate the silence of space — an environment astronauts would be well served to grow accustomed to.

**What they've found is that when all outside noise is removed from an enclosure, human hearing will do its best to find *something* to listen to.** In a room where almost 100% of sound is muted, people begin to hear things like their own heartbeat at a greatly amplified volume. As the minutes tick by in absolute quiet, the human mind begins to lose its grip, causing test subjects to hallucinate.

NASA then monitors how the would-be [space](#) explorers react, and whether they can get past the very obvious awkwardness of seeing or hearing things that aren't actually there. **According to lab officials, the longest anyone has lasted is 45 minutes before being allowed to hear the sweet sounds of planet Earth once again.**

In the end, the chamber has proven a valuable scientific tool, just don't plan on renting it for some peace and quiet — it may do more harm than good.

**Sound is a terrific memory anchor and memories are comprised of not only words, but pictures.** When someone asks us to “remember when...” we don't remember in words, we recall entire scenes first, then fill in with dialogue. Sound triggers visual images very effectively.

The study of how radio messaging influences listeners is important for marketers. While only a certain percentage of listeners are fully engaged at any given time, messaging does register with those who even listen passively.

Dr. Robert Heath from the UK, has spent years studying how the human mind absorbs commercial messaging. Several of his articles have been published in the Journal of Advertising Research. His research describes and explains how advertising is processed at different levels within the human brain even by people who are only partially engaged or even completely disengaged from the commercial message.

He's identified several ways in which people learn, retain and absorb commercial content while paying little or even no attention to the messaging:

1. **Passive learning**- Low attention cognitive process that requires partial attention and deployment of cognitive resources.
2. **Implicit learning** – An automatic non-cognitive process that requires no attention or any deployment of cognitive resources

Heath defines the third type of learning as “explicit,” which occurs when all cognitive resources are focused on the printed page, the radio or television. But unlike print, which requires total attentiveness, radio messages can also be absorbed passively as well as implicitly. Explicit learning has been linked to the rational processing of commercial messages, while passive and implicit learning tend to appeal to the more enduring and influential emotional processing of commercial messages. This is another benefit of radio's audio messaging as in the fast pace of everyday life, “considered” or rational decisions tend to be subservient to “intuitive” or emotional decisions. This combination gives Radio the most complete attentiveness package of any medium.

Radio is a “soak in” medium rather than “seek out” medium. We typically consume radio in a more relaxed state that enables relevant messages to register more effectively than when we are in a “seek out”, task oriented mode as is often the case with internet messaging.

Due to most sound being processed subconsciously, we're often oblivious to the impact sound has on our product perception and choices. But whether we realize it or not, sound has the ability to

inspire, create desire and persuade. Neurologist Richard Cytowic says, “Not everything we are capable of knowing and doing is accessible to, or expressible in, language. This means that some of our personal knowledge is off limits even to our own inner thoughts! Perhaps this is why humans are so often at odds with themselves, because there is more going on in our minds than we can ever consciously know.”

The automotive industry has long recognized the power of sound to generate sales. Studies show that almost a third of consumers can distinguish one car from another by the sound of their doors closing. Chrysler, Mercedes and Acura all have acoustic engineers working on refining the sound of their car doors. Bentley’s acoustic engineers have actually influenced the design of the car to achieve a unique and instantly identifiable sound in a market where almost half (44%) of consumers say the sound of a car is an important factor in their purchasing decision.

It’s been proven time and again that sound can alter people’s behavior. Numerous experiments have illustrated that the pace of music can influence the size of the check at restaurants—the slower the music the greater the check.

A grocery store study confirmed that the type of music played greatly influences the choice of wine. And when classical music is piped over loudspeakers in the London Underground, crime dropped 33%. In the 1920s, the use of sound actually assisted in making people more comfortable with the elevator. When first introduced, people had a high level of anxiety about riding in elevators. Recognizing the calming effect music had on people, soothing music was pumped in to make passengers more at ease—and the term “elevator music” was born.

While sound contributes heavily to the perception of quality in the automotive industry, it is making major inroads in other categories. Kellogg’s employed a company to design a particular crunching sound for its cereal. Nokia succeeded in trade-marking its ringtone, with 41% of global consumers able to recognize the Nokia tone. Bahlsen, a German food company, created a division of researchers to engineer an optimal crunch for its biscuits and potato chips, going

as far as developing special microphones placed inside testers' ears to record crunching. Other companies clearly understand the power of sound to convey freshness by focusing on the sound of opening a jar of freeze-dried coffee, a can of soda or a can of Pringles, which are largely engineered.

Sound also plays a critical role in gaming. How engaging would Space Invaders be if the music intensity didn't pick up as the aliens got closer? Ogilvy used sound on behalf of Fanta to more effectively position the product with teens by creating a mobile application that used high-pitched frequencies audible only to people under 25. These sounds included wolf-whistles, warnings and "pssts," along with tags representing traditional words and phrases.

Author Julian Treasure said, "Sound affects human beings in four ways: physiologically, psychologically, cognitively and behaviorally. These effects are profound, changing how we feel and what we do - including our commercial decision-making and actions."

Without the effective use of sound, the ability to evoke emotion is severely limited. Sound has an immediate, direct link to both the rational and emotional parts of our brain. Sound shapes our thoughts, our feelings, our behaviors, our lives. With all of the scientific and physiological evidence available, there is a real opportunity to begin using sound and our sense of hearing more effectively in the marketing of products particularly in radio. After all, there are only two senses that can be "broadcast" to reach customers en masse- sight and our sense of hearing. Sound enables the messenger to reach a place within the human mind that visual branding cannot — and does not — approach. We can hear around corners, we can see in the dark and our sense of hearing enables us to envision a product in a personalized fashion based upon our own individual experiences.

Jack Trout has said, "After analyzing hundreds of effective positioning programs, we ran into a surprising conclusion: the programs were all verbal. There wasn't a single positioning concept that was exclusively visual. We have come to the conclusion that the mind works by ear, not by eye."

Helen Keller wrote, “The problems of deafness are deeper and more complex, if not more important than those of blindness. Deafness is a much worse misfortune than blindness for it means the loss of the most vital stimulus...the sound of the voice that brings language, sets thoughts astir and keeps us in the intellectual company of man.”

The following excerpt is taken from the book, “What Sticks”.

Dr. Daniel Schacter professor of psychology at Harvard: you may think that because you pay little attention to commercials....your judgment about products are unaffected...but a recent experiment showed that people tend to prefer products featured in ads they barely glanced at several minutes earlier...even when they have no explicit memory of having seen the ad.

Dr. Elizabeth Loftus, ranked 58th on a list of the 100 most influential researchers in psychology in the 20th century wrote when she was at the University of Washington:

In many ways the ear is superior to the eye. What I mean by that is that there is evidence from controlled laboratory studies that show when you present a list of words to people and you present either auditorily, say on a tape recorder, or you present it visually, say on slides, people remember more words if they hear the words than if they see them.

In order to understand why, you have to realize there are essentially two kinds of memory. There is the iconic memory which stores visual images and the choic memory which stores auditory images. When the eye see some picture or takes in some visual information, a fairly complete image registers itself in iconic memory., but it fades away fairly quickly, on the order of say a second or so. However when the ear takes in information, it too, registers a fairly complete image but it fades away more slowly, say on the order of 4 or 5 seconds.

The power of the spoken word never really stops. There is an important study that shows that even when people were anesthetized during surgery, if they are hypnotized later, can remember some of the things that were spoken, some of the sounds they heard during surgery.

In a 2011 issue of [Media](#) magazine, and the subsequent editorial, were devoted to "The Brain." I began reading with the hope that the issue's guest editor, Dr. Carl Marci, would cover the ability of sound to impact the brain. But aside from one article, which touched on the impact of music in advertising, there was very little discussion on the topic.

If, indeed, the brain is the **ultimate screen** "where everything ultimately plays out," as A.K. Pradeep from Neurofocus states in the magazine, then what are the various ways for marketers to impact it?

"Screens" are synonymous with viewing and sight. But are visual stimuli required to generate images? The answer is obviously no. Humans are quite capable of creating pictures in our minds by visualizing. This is defined as "recalling mental images or pictures," which requires no direct visual stimulation. And what happens while we sleep? Every night, our eyes are completely closed, yet we are creating vivid imagery while dreaming. So the human brain is quite capable of "seeing" without direct visual stimulation.

A fact overlooked by many is that the sound waves that enter our ears do greatly impact what we ultimately see. We hear a voice, a commercial, a song, a movie trailer, a tire screech, a church bell and immediately we begin to visualize, **activating our own internal \_ video screen that's fueled by sound.**

A powerful argument could be made that this type of intensely personal visualization can actually be more impactful than the actual picture. Renowned author and marketing expert Jack Trout came to understand the impact of sound after analyzing hundreds of positioning programs. He said: **"We have come to the conclusion that the mind works by ear, not by eye."**

Need further proof of our ability to see without direct visual stimuli? Imagery Transfer anyone? In a recent study we conducted for a major national advertiser, without prompting, consumers continually referenced the company's television campaign after exposure to its radio commercials.

The Hindus have a saying, "Nada Brahma," which translates to "The

world is sound." While this might be overstating things a bit, the ability of sound to trigger visual images, motivate consumers and impact our brains is immense. Certainly, this warrants the ultimate sound vehicle -- radio -- to be elevated from its current "lost continent" status in some marketing departments.

A word has the power to change your life. Think about that for a moment because it is literally an Earth-moving statement – to change your life.

Words, my friends, change everything! Words have a dramatic effect on what we know, how we interact with people and the decisions we ultimately make. Words can influence us, inspire us or just as easily bring us to tears.

Words change our relationships, our demeanor, our entire system of beliefs, and even our businesses. Being a planet or not being a planet makes a major difference, just as the words "I love you" or "I hate you" have majorly different meanings behind them. Words have a powerful and undeniably overwhelming influence on us – for good and, at times, for bad. Think for a moment how words have changed your life:

*Marry me! It's a girl! You're hired! You're fired. We won! We lost. Guilty. Not guilty.* Google is a company with a focus on classifying and organizing words. It is a very simple focus, really: to be better than any other entity at organizing words. Words have become the key to everyday life. In our vehicles, many of us use words to get assistance, either via a service such as OnStar (I need help, my car won't start) or via GPS (and don't turn left when told to turn right, or the next word to leave your mouth may well be S%\*T).

## The new science of our cross-wired senses

*Yes, your ears can change what you taste. What discoveries about cross-sensory perception are revealing about the brain.*

*By Courtney Humphries*

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Martin Gee/Globe Staff

The senses have always been our portals into the outer world. We have the classic five that Aristotle talked about — sight, hearing, smell, taste, and touch — plus more recently recognized senses of balance, temperature, pain, and body position and movement. Each evolved to collect some distinct type of information about our environment, and to tell us our status within it.

That's largely how we tend to think about the senses, anyway: separately, each one its own distinct way to understand the world around us.

But in recent years, various findings have emerged to challenge that assumption — strange illusions in which one sense seemed to change the perceptions of another. One study published in 2000 particularly grabbed people's attention: When researchers at Caltech showed test subjects a brief flash of light accompanied by two quick tones, many people saw two flashes instead of one. The same effect occurred when the researchers tapped their subjects' skin twice as the light flashed. Vision — considered our most reliable and dominant sense — could be altered by sound or touch.

And that wasn't all. Other studies showed that what people saw affected what they heard; **that certain types of music or background noise affected how food tasted**; and that smells could influence how a texture felt to the touch.



What the researchers were uncovering, in other words, is that our senses are not so separate after all. Scientists have realized that interaction between the senses “is the rule rather than the exception,” says Ladan Shams, one of the researchers who conducted the light-flashing study and now a sensory scientist at the University of California at Los Angeles. From the earliest stages of perception, it appears, the senses are enhancing, competing with, and even altering one another in surprising ways.

Since then, a new field has emerged to study cross-sensory perception, with laboratories throughout the world devoted to understanding how the senses merge. Scientists are developing a new way of thinking about how our brains are organized and how we perceive the world. And what began as basic scientific research to understand the brain’s organization is spreading into other fields, such as marketing: ***Companies are starting to engineer foods that taste better by appealing to the eyes and ears***, for instance. The work may even have implications for medicine — helping to explain, say, how the brain can compensate for a missing sense — and for education.

It might seem unsettling that the perceptual tools we rely on to navigate the world are so fluid — not just capable of being fooled, but capable of fooling one another. But the constant interaction and interference between our senses, in fact, is central to one of the brain’s most astonishing feats: its ability to take a sea of complex, conflicting sensory input and assemble it into a fairly reliable picture of the world.

Philosophers have long debated the primacy of the senses in knowing truth, but they have rarely questioned their separateness. The Epicurean poet and philosopher Lucretius, for example, argued that the senses couldn’t influence one another, “for each has powers discrete and apart, its separate force.” Because of these separate powers, he reasoned, “it must be, then, that one sense cannot prove another wrong.”

Yet we’ve always understood intuitively that senses do affect one another in certain ways. As anyone who’s ever eaten dinner while nursing a bad cold knows, nearly all of food’s flavor comes from our

sense of smell, not taste. Since the dawn of the talkies, moviegoers have experienced this kind of sensory interaction, too. Their ears might hear sounds from a speaker behind them, but their eyes persuade them that the voices are coming from actors projected on the screen.

Now, science is showing that such connections among the senses are more widespread and deeply rooted than we ever imagined. What happens in the movie theater isn't just an isolated illusion — the blending of sensory information is critical for the brain to create a seamless interpretation of its outside world.

Research into perception is following suit. Over the past decade, previously disparate studies of the senses have begun to merge. There is now a yearly conference devoted to multisensory research, and the topic is finding its way into neuroscience meetings. Some scientists focus specifically on the integration of senses, while others have expanded their previously single-sense research to include others. Shams, at UCLA, says that while some people initially doubted whether isolated illusions had bearing on the everyday function of the senses, most now accept there are countless ways they are intertwined.

One researcher who has spearheaded this change is psychologist Charles Spence, head of the Crossmodal Research Laboratory at Oxford University. While neuroscientists have been piecing together how senses connect in the brain, his work has revealed how the crossing of sensory information affects perception and behavior. His recent work on the psychology of flavor perception, for instance, has shown that the flavor of your food is influenced by touch, vision, and even sound. A study from his lab a few years ago showed that people rate potato chips as crisper and better-tasting when a louder crunch is played back over headphones as they eat. **A study published this year showed that people thought a strawberry mousse tasted sweeter, more intense, and better when they ate it off a white plate rather than a black plate.** Other researchers have conducted similar studies showing that our impressions of experiences, and our emotional responses to them, derive from a

blending of different kinds of sensory input — a process that is usually completely unconscious.

These findings are leading to a fuller picture of how we really perceive the world around us. **Barry Stein, a multisensory scientist at Wake Forest University**, says that what's been surprising is how early in the process of perception the senses begin to overlap. Even before the brain makes higher-level judgments about the sensory information it is receiving, Stein says, special "multisensory neurons" that respond to more than one sense begin to synthesize it.

This process allows the brain to quickly blend different channels of information into one impression. In some cases, senses enhance one another: A distant image paired with a weak sound can appear more noticeable than each alone. In some cases they compete with each other and one wins out (as your eyes win over your ears in the movies). In others, the information merges into something new; when people watch a video of a person saying "ga" while the audio is dubbed with a voice saying "ba," they hear an intermediate "da." Though the senses can fool us in certain cases, being able to integrate them helps us make a quick judgment and move on, rather than puzzling over conflicting information.

The ability to coordinate among the different senses seems to be something the brain learns; we're not born being able to do it. "You'd think that the brain comes with all this hardware built into it," says Stein. "But that's not the case." Instead, research shows that after we're born, the brain quickly learns to put information from the senses together. This early wiring of the brain to coordinate sensory input helps explain why people born without a sense who then regain it — such as deaf people who receive cochlear implants later in life — have a difficult time learning to integrate the new sensory information.

This research sheds light on other fascinating phenomena that neuroscientists have observed in those with impaired sensory functions, too — and it may ultimately suggest possible therapies. **In blind people, for example, research has shown that the sense of touch activates the visual cortex; in other words, areas of the brain normally designated for processing one sense can adjust to make**

use of information from another. Then there are people, like those with autism or other conditions, who have impaired abilities of sensory integration. Therapists influenced by the science of multisensory integration have worked with people with autism to create “sensory diets,” interventions that focus on using senses together.

And the new work may ultimately affect how the rest of us learn, as well. Shams’s group at UCLA has found that people learn a visual task better when it’s accompanied by sound, for instance — even when they are later tested using only vision.

In broader commercial applications, meanwhile, the science is already providing a new basis for what marketers have long surmised: They are selling customers more than just the core sensory experience. Restaurant owners, for instance, know that choosing decor, lighting, music, and table settings that complement their food can boost their bottom line, and companies have long market-tested food products for texture and packaging as well as taste. But we are now beginning to understand that these elements don’t just create atmosphere and associations — they can actually make food taste different. For example, several studies have found that adding red coloring can make drinks taste sweeter, allowing a company to reduce sugar content while turning color up a notch.

After all, no sight or sound exists in a vacuum; at the deepest neurological level, when we sit down to that meal, all our senses will be working together.

## **Sound Science**

Many scholars have conceptualized radio as a low involvement medium (Speck & Elliott, 1997), with much of the overall time spent listening being actually spent doing other things while the radio plays in the background. The implication here is that information from radio commercials mostly fails to penetrate the cognitive system. However, a recent series of studies using persuasive radio messages as stimuli (Potter, in press, 2000; Potter, Chen, Cho, & Zhou, 2000; Potter, Lang, & Bolls, 1998) suggests that while listener involvement may

vary greatly from person to person, there are other structural attributes of an audio message that cause the human cognitive system to automatically pay attention to the message. The biological mechanism for this automatic allocation of cognitive resources is known as the **orienting response** (“the OR,” Pavlov, 1927; Sakolov, 1963; Watson & Gatchel, 1979). This is hard-wired into the cognitive system such that a person will predictably have an OR in response to **novelty** in the environment or to learned signals, such as hearing one’s name called out. An occurrence of an OR in a human subject can be identified by physiological changes such as a momentary deceleration in heart rate and increase in skin conductance over 6 to 10 seconds following the onset of the novelty into the environment (Graham, 1979; Watson & Gatchel, 1979);

The implications of this series of studies is that, regardless of the fact that radio tends to be a medium of lesser involvement, there are certain identifiable structural features that the human brain cannot help but cognitively process—at least initially. This is even the case if the listener has the radio on in the background while involved primarily in completing other tasks. One of these features that listeners automatically process is the beginning of a commercial message (Potter, Lang, & Bolls, 1998).