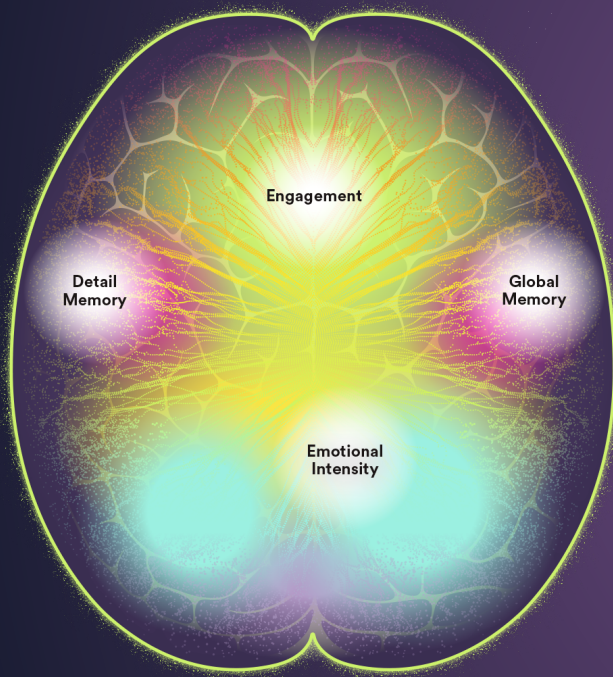


Sonic Science: Understanding your brain on sound

There's something special about sound. Sometimes, it feels like magic that can't be explained. But the unique power of sound actually can be explained—with science, of course. We've partnered with the research team at Neuro-Insight to break down why digital audio has such a distinct impact.



To understand our cognitive processing of audio ad signals, Neuro-Insight uses four proprietary metrics: Engagement (the relatability and relevance of the ad), Emotional Intensity (the strength of the emotions tied to the ad), Long-Term Memory for Global Features (memories, feelings, and themes associated with the ad), and Long-Term Memory for Details (the specific message and details of the ad).

Spotify vs Digital Audio vs Radio



Spotify Provides the Most Engaging Audio Experience

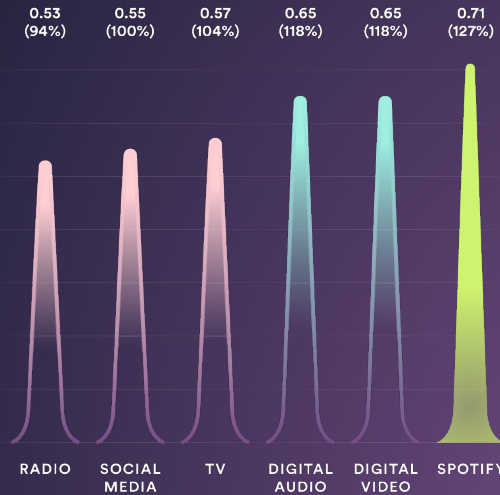
Neuro-Insight's technology shows that the listening experience for digital audio is significantly elevated across all metrics compared to radio. And the power of digital audio is amplified even further on Spotify thanks to its extensive product features that are built for interactivity and personalization.

Engagement Levels

Spotify drives higher engagement levels

Spotify's engagement outperformed all other forms of media, not just other audio types.

- +9%** Digital Audio
- +23%** TV
- +27%** Social Media



It turns out those qualities didn't just lift Spotify above other audio formats. The Spotify experience drove higher engagement than TV, digital video, and social media as well.

Source: Radio, Digital, and Social Media from Historical benchmarks, Neuro-Insight and Spotify, June 2021

All Ears On You: What It Means For Brands

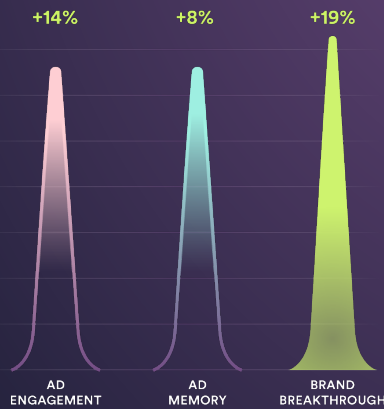
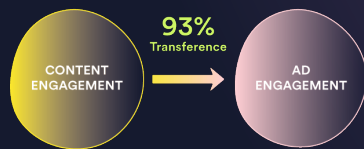
Spotify's impact on the brain can result in a significant impact on Ad Memorability and Brand Breakthrough* alike. Our research shows that 93% of the brain's engagement with the content transferred directly into ad engagement as the listener moved from their music and podcasts to the ad. As a result, the ads saw 19% higher Brand Breakthrough on Spotify compared to all other media.

For more information on our research and the power of advertising with Spotify, get in touch with our Sales team or go to ads.spotify.com

**Ad memorability is the average Long-Term Memory for Details over the entirety of the ad. Ad norm score: 0.64 Brand breakthrough is the Long-Term Memory for Details at point of branding. Ad norm score 0.61. In-market success achieved if Brand Breakthrough achieves 0.7 or higher on Long-Term Memory for Detail.*

Spotify offers high ad engagement on generating higher brand breakthrough

93% of the brain's engagement with the content on Spotify is transferred directly into ad engagement.



+19% Brand breakthrough on Spotify vs ad norms on all other media

Source: Sonic Science research, part one, Neuro-Insight and Spotify, June 2021

Methodology:

Spotify and Neuro-Insight conducted the largest audio study of its kind with over 600 participants, studying both music and podcasts. The research studied the impact of Spotify and its strengths against terrestrial audio, video, digital streaming and social media platforms. It leverages Neuro-Insight's Steady State Topography (SST) which is a proprietary technology that measures neural processing speed at the scalp in order to build a second-by-second picture of activity in the brain. It has been validated by research and used in scientific and clinical research applications for over fifteen years before becoming a neuromarketing tool. This technology is unique in that it can focus in on our decisions making processes in the brain to help us get a deeper understanding of why we consume and buy content.