

Detect Sounds on the Margins of Certainty

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Hack #47

Detect Sounds on the Margins of Certainty

Can you sort the signal from the noise? Patterns and regularity are often deeply hidden, but we're surprisingly adept at finding them.

Our perceptual abilities and sensory acumen differ from one individual to another, making our threshold for detecting faint or ambiguous stimuli vary considerably. The brain is particularly good at making sense of messy data and can often pick out meaning in the noisiest of environments, filtering out the chaotic background information to pick out the faintest signals.

In Action

A sample of Bing Crosby's "White Christmas" has been hidden in the sound file on our book web site (<http://www.mindhacks.com/book/47/whitechristmas.mp3>; MP3). The sound file is 30 seconds long and is mostly noise, so you will have to listen carefully to detect when the song starts. The song will start either in the first, second, or third 10 seconds and will be very faint, so pay close attention.

You'll get more out of this hack if you listen to the sound file before knowing how the music has been hidden, so you're strongly recommended not to read ahead to the next section until you're done so.

How It Works

If you managed to hear the strains of Bing Crosby in the noisy background of the sound file, you may be in for a surprise. The sound file is pure noise, and despite what we promised earlier, "White Christmas" is not hidden in there at all (if you read ahead without trying it out for yourself, try it out on someone else). Not everyone is likely to detect meaningful sounds in the background noise, but it's been shown to work on a certain subset of the population. An experiment conducted by Merckelbach and van de Ven [1] reported that almost a third of students reported hearing "White Christmas" when played a similar noisy sound track.

There's been a lot of debate about why this might happen and what sort of attributes might be associated with the tendency to detect meaning in random patterns. In the study mentioned earlier, the authors found that this ability was particularly linked to measures of fantasy proneness – a measure of richness and frequency of imagination and fantasy - and hallucination proneness - a measure of vividness of imagery and unusual perceptual experiences. If you, or someone you tested, heard "White Christmas" amid the noise and are now worried, there's no need to be. The tendencies measured by Merckelbach and van de Ven's study were very mild and certainly not a marker of anything abnormal (after all, it worked in a third of people!), and we all hallucinate to some degree (not seeing the eye's blind spot - "Map Your Blind Spot" [Hack #15] - is a kind of hallucination).

However, there is evidence that people who believe in certain paranormal phenomena may be more likely to find patterns in unstructured information. Brugger and colleagues [2] found that people who believe in ESP are more likely to detect meaningful information in random dot patterns than people who do not. Skeptics are often tempted to argue that this sort of experiment *disproves* ESP and the like, but the other finding reported in the same study was that meaningful patterns were more likely to be detected if the random dot pattern was presented to the left visual field, regardless of the participant's belief in ESP. The left visual field crosses over to connect to the right side of the brain, meaning that random patterns presented to be preferentially processed by the right hemisphere, seem to be more "meaningful" than those presented either to both or to the left hemisphere alone. This demonstrates another aspect of hemispheric asymmetry ("Use Your

Right Brain - and Your Left, Too" [Hack #68]) but also hints that people who have high levels of paranormal beliefs may be more likely to show greater activation in their right hemisphere than their left, an effect that has been backed up by many further studies.

This pattern of hemispheric activation is linked to more than paranormal beliefs. Researchers have argued that it may be linked to a cognitive style that promotes "loose" associations between concepts and semantic information, a style people have if they often see connections between ideas that others do not. This is not necessarily a bad thing, as this tendency has been linked to creativity and lateral thinking. Detecting patterns where other people do not may be a very useful skill at times. Although it may result in the occasional false positive, it almost certainly allows genuine patterns to be perceived when other people would be confused by background perceptual noise.

See Also

1. Merckelbach, H., & van de Ven, V. (2001). Another white Christmas: fantasy proneness and reports of "hallucinatory experiences" in undergraduate students. *Journal of Behavior Therapy and Experimental Psychiatry*, 32 (3), 137-144.
2. Brugger, P., Regard, M., Landis, T., Cook, N., Krebs, D., & Niederberger, J. (1993). "Meaningful" patterns in visual noise: Effects of lateral stimulation and the observer's belief in ESP. *Psychopathology*, 26, (5-6), 261-65.

—Vaughan Bell