**////Title: How Soundtracks Shape What We See**

**////Stand-first:**

Music has the power to influence how we interpret the world around us. Dr. Alessandro Ansani from the Department of Psychology at Sapienza University of Rome believes this interpretation is multidimensional and involves several interconnected cognitive factors and mechanisms. He has recently demonstrated the significant impact that background music can have on our interpretation of a simple movie scene, by manipulating the soundtrack.

**////Body text:**

Music has a profound effect on human behaviour. It can alter our mood, emotions, and even behaviours. Many studies have aimed to investigate the impact music has on completing physical tasks, work performance, speech, memory, and learning. Since the 1980s, much of this research has focused upon music’s commercial influence in areas such as marketing, shopping and advertising. In the last few years, the digital boom has pushed research into areas such as online shopping, website experience, video game performance and virtual gambling.

The precise timing of a piece of music being played impacts how it is processed. Research into music interpretation typically involves music being played before or during the presentation of the research stimulus. ‘Induction’ refers to when music is played before the task, whereas ‘background’ refers to when the music accompanies the task.

We use different mental processes during induction and background scenarios. Induction music encourages participants to experience emotions personally, whereas background music projects these emotions onto the task or scene being watched. This causes parallel and multimodal processing to take place, which may have varying effects depending on the nature of the research task. Many previous studies have shown background music to be a distraction, particularly during cognitive tasks that rely on learning, memory, or reading. However, when integrated with visuals, the human mind expects there to be a connection and uses the background music to add semantic and content information. As such, soundtracks provide an interpretive framework that can act as a secondary source of emotions.

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Dr. Alessandro Ansani, in collaboration with the Cosmic Lab at Roma Tre University, conducts research on the psychological effects of background music on our interpretation of visual scenes. In particular, he wants to address the methodological criticisms of previous studies.

His recent study involved 210 participants watching a short simple scene from a largely unknown movie, featuring an emotionally neutral male character walking within an empty building. Participants viewed the scene in their own homes, through smartphones and computers, to make the test conditions as similar to real-life as possible. There were three different experimental groups in which each featured the same video but was combined with different background music.

The first experimental group heard an anxiety-inducing orchestral piece by the composer Sergei Rachmaninov to accompany the video. The second group listened to a soft melancholic jazz piano solo by Bill Evans. The third group acted as a control condition in which the participants only heard ambient background sounds while watching the movie. The musical accompaniments have evoked markedly differing reactions in previous research. They both conjure negative emotions but differ in their level of arousal. The Rachmaninov piece, *The Isle of the Dead*, has variation in its sound level that creates fear and evokes tension through increasing intensity. In contrast, the soft jazz piano’s mellowness of *Like Someone in Love* is associated with sadness and tenderness.

Dr. Ansani believes interpretation in such scenarios is multidimensional, involving several interconnected cognitive processes. After watching the videos, participants completed short online questionnaires about how they felt towards the main character, how they thought he was feeling, what kind of personality he had and what they thought about the environment around him.

Importantly, this is the first study of its kind to measure several different cognitive factors at the same time. The study was also repeated in a laboratory using eye-tracking and pupillometry technologies, as Dr. Ansani proposed that different eye movements and pupil dilation would reflect differing cognitive interpretations, capturing some unconscious elements of processing.

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The results convincingly demonstrated that specific soundtracks alter the interpretation of a short movie. While viewing an ambiguous scene, the participants utilised the music to help them interpret events. The strongest findings were around empathy. As predicted by Dr. Ansani, the experimental group who listened to the more melancholic piece displayed more empathy towards the main character and even attributed sad memories towards him. In contrast, the disquieting music in the other experimental group created an eerie feel, leading participants to attribute a sense of evil intent to the main character, and it did not elicit empathy.

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The research findings particularly demonstrated the effects of empathy towards the character, plot anticipations and environmental perception. There were mixed outcomes in relation to how participants perceived the personality traits of the main character. More specifically, agreeableness had higher scores with the melancholic piece, while conscientiousness increased when the disquieting piece was played.

Moreover, the participants with the eerie music had increased pupil dilation, showed a higher amount of explorative eye movements, and a larger number of gaze fixations on a half-hidden character that was by no means noticed with the melancholic soundtrack.

Dr. Ansani’s promising results strengthen the theory that the influence of music upon interpretation is a multidimensional cognitive process. He suggests that further research should explore the impact of nuisances within a piece of music, such as speed, volume, and tone, and investigate how these subtleties affect interpretation. Another interesting focus would be to define what it means for a piece of music to fit a visual scene and what happens cognitively if it does not.

Lastly, after this study, Dr. Ansani published a work on the influence that background music exerts on time perception, finding that, no matter the music’s emotional valence, its level of arousal positively predicts time estimation.

One certainty arising from Dr. Ansani’s work is that music is a very powerful tool that shapes our interpretation of the world, and this can occur naturally as well as through purposeful curation.

This SciPod is a summary of the paper ‘[How Soundtracks Shape What We See: Analyzing the Influence of Music on Visual Scenes Through Self-Assessment, Eye Tracking, and Pupillometry](https://www.frontiersin.org/articles/10.3389/fpsyg.2020.02242/full)’ from the open access journal, Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2020.02242.

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