



Trabajo Fin de Grado

Title: Crazy for Music! Music and Mental Health

What Effect does Music have on Employees' Mood and Productivity Levels?
An Analysis of the Impact of Background Audio on Cognitive Performance
and Mood in the Workplace.

Student: Clodagh Ryan

Director: Anitha Srinivasan

Course: E4/ADE

Academic Year: 2025/2026

Abstract

This study investigates how various audio backgrounds - AI generated workflow audio, instrumental music, silence and personal preference music affects workplace performance and mood. It draws on theories of cognitive load, selective attention and mood regulation and investigates how the different audio environments impact task accuracy, reaction time and overall emotional state during a cognitively demanding task. A mixed method research approach was used, which combined quantitative performance and mood data from a Flanker Task with qualitative mood measures reported by participants. Results demonstrated that AI workflow audio and instrumental music enhanced participant accuracy, reaction time and produced a more stable mood compared to personal preference lyrical music which had the opposite effect. It was found that the lyrics interfered with participants' processing abilities and increased their cognitive load to a point where it significantly impaired their accuracy. Silence produced mixed outcomes as it worked well for some but poorly for others which highlighted the presence of individual differences when it comes to ideal focus conditions. This research suggests that providing an audio environment with characteristics designed to sustain attention and optimise cognitive performance can truly have a positive impact both in terms of performance and emotional stability in the workplace. It contributes to wider conversations surrounding organisational psychology and enhancing workplace conditions for both employees and the companies they work for.

Keywords:

Auditory Environments, Cognitive Performance, Reaction Time, Focus, Cognitive Load, Mood Change, Workplace Performance

Table of Contents

1. Introduction

2. Research Question & Objectives

2.1 Research Question

2.2 Objectives

3. Literature Review

3.1 Mood Regulation

3.2 Music in the Workplace

3.3 Cognitive Effects of Audio

3.4 Importance of Audio Type

3.5 AI-Generated Audio & Adaptive Audios

3.6 PLOS ONE Study (Orpella et al., 2025)

3.7 Broader Perspectives on Attention, Focus & Workplace Performance

3.8 Gaps in the Literature

4. Data Description

4.1 Abbreviations

4.2 Primary Data

4.3 Secondary Data

5. Methodology

5.1 Research Design

5.2 Primary Research

5.3 Experimental Procedure

6. Results

6.1 Flanker Task Accuracy

6.2 Flanker Task Reaction Time

6.3 PANAS Mood Assessment Results

6.4 Correlation Analysis

6.5 Qualitative Results

6.6 Summary

7. Discussion

7.1 Interpretation of Cognitive Performance Findings

7.2 Interpretation of Reaction Time Findings

7.3 Interpretation of Mood Findings

- 7.4 Relationship between Mood & Performance
- 7.5 Comparison with Existing Literature
- 7.6 Practical Implications
- 7.7 Limitations
- 7.8 Recommendations

8. Conclusion

9. Bibliography

10. Appendices

- 10.1 Flanker Test Results
- 10.2 PANAS Mood Results
- 10.3 Qualitative Responses

11. AI Declaration

1. Introduction

Music has become an increasingly popular feature in the workplace in recent years. This can be attributed to the increased number of employees who work from home or habits we picked up during the pandemic lockdowns. It has become more and more acceptable to use audio devices such as earphones and headphones in the workplace as many people argue it helps them to concentrate. It creates an image of intense focus and is seen as a mood regulator and stress reliever. While it may be a very popular tool in the modern workplace, its effectiveness is also widely debated. Many argue that background music acts as more of a distraction, reducing the accuracy and effectiveness of employees, especially when it comes to more complex, analytical tasks where a high level of focus and meticulousness are essential. These differing opinions demonstrate the need for clarity on this issue.

Understanding the real impact of background audio is becoming increasingly important nowadays as we live in a world that values psychological motivation and well being now more than ever before. Companies across the world are striving to find the right balance between financial compensation and emotional care for their employees. Traditionally the main incentives provided to employees were often pay increases or promotional opportunities. However, there has now been a rise in demand for the idea of a healthy work life balance and less tangible incentives like a positive work environment and flexibility in the workplace. In the past, listening to music while working was often viewed as a distraction or something to be done on one's personal time, not the company's. Now that it is being deemed increasingly acceptable and claimed to increase productivity, it is vital for both employees and their employers to have a clear understanding of exactly how music, more specifically what types of music can enhance their performance in the workplace.

This research investigates the correlation between background music and workplace performance. It focuses on two important results: productivity and mood. Productivity will be measured by overall task performance, attention and processing speed. Mood will be measured through participants' emotional state and mood change before and after completing tasks with a variety of audios. One of the key elements of this research is comparing different types of audio backgrounds such as instrumental, lyrical, AI generated and of course silence to determine whether they enhance or distract participant performance.

One of the main foundations of this research is the recent PLOS ONE study titled "Effects of music advertised to support focus on mood and processing speed" (Orpella et al, 2025). This contains key evidence on the effects of differing audios on both reaction time and mood. While most studies regarding the impact of background audio focus on either performance or mood as separate entities, this study uses the PANAS scale to measure mood changes and the effects this has on performance. The PANAS scale is a standard before and after measure of positive and

negative affect. It calculates a Total Mood Change (PA – NA) to represent overall mood improvement or decline.

The study then calculates reaction time using a cognitive test called a Flanker Task which is a tool used to measure participant focus through the use of pattern recognition and processing speed. Once these results were collected, a comparative analysis between the two sets of data was conducted to determine whether or not there was a correlation between change in mood and reaction time using different audio backgrounds.

2. Research Question and Objectives

2.1 Research Question:

To what extent does listening to music at work influence employee productivity and focus?

This study uses a combination of both primary experimental research and secondary research using existing literature on organisational psychology, music cognition and human behaviour in order to effectively answer this question. By using these established findings along with new, experimental research, this study aims to contribute a new perspective on the effects of background audio on workplace performance rather than simply confirming or arguing against existing research.

2.2 Objectives

1. Determine the extent to which listening to music influences the productivity and focus of employees.
2. To identify which types of music (e.g. instrumental, lyrical, energetic, calm, AI generated) improve or interfere with performance.
3. Explore the role of personal preference in music choice on workplace satisfaction and motivation.
4. Provide recommendations for organizations on integrating music into the work environment effectively based on the research conducted.

3. Literature Review

3.1 Music as a Tool for Mood Regulation

There have been studies conducted for example, Haake (2011) which demonstrates that music is often used by employees to improve mood, reduce stress and regulate emotions in the workplace. As a consequence of this improved mood, a higher quality of work and stronger levels of concentration are reported. Listening to music was described as a method to transition smoothly between tasks and maintain motivation which can often be very difficult in an office environment for example.

On a similar note, Lesiuk (2005) highlighted the improvement in the performance of software developers when they listened to music. In this study, participants reported feelings of enhanced relaxation and engagement and as a result, more objective analysis showed an improvement in their problem solving abilities. This can be linked to “Affective Modulation Theory” (Braem et al., 2013), which states that humans use external stimuli like music, in order to balance their internal emotions.

There has been neuroscientific research conducted that also supports these ideas. Researchers used fMRI and EEG tools which highlighted how music activates brain areas associated with emotion, reward and attention. The term fMRI stands for Functional Magnetic Resonance Imaging, and is used to measure brain activity by monitoring changes in blood oxygenation. On the other hand, EEG which is an abbreviation of Electroencephalography, uses small wire devices called scalp electrodes to measure real time electrical activity of the brain. It examines regions of the brain such as the nucleus accumbens, amygdala and the prefrontal cortex. This supports the theory that music indirectly influences workplace performance when it alters our emotional and motivational states. (Blood & Zatorre, 2001; Koelsch, 2014)

Juslin & Västfjäll (2008) described how music is linked to emotional contagion. This refers to the listeners’ ability to consume the audio and make it personal to them by internalising the emotional tone they hear. This would explain the reason why listening to calm, low tempo music can reduce stress, while energetic music can increase alertness and motivation.

3.2 Music in the Workplace

It has been widely accepted in organisational psychology for years that performance in the workplace isn’t simply dependent on an employee’s individual ability or motivation. The environment in which they work plays a significant role in the standard of work produced (Campbell, 1990). Background audio for example has been recognised as a tool used by organisations more and more to improve employee well being, workplace satisfaction and overall productivity (Keeler et al, 2025). This is becoming increasingly important as there has been a mass movement in recent years towards non-financial incentives and motivators, especially those

focused on nurturing employee well being and mental health (Deloitte, 2024). A study by Fox and Embrey (1972) observed that factory workers reported higher stamina and lower levels of fatigue during repetitive assembly work while music was played. This would suggest that music can act as a sort of psychological cushion against boredom during these otherwise laborious tasks.

More recent studies have investigated these ideas in a more modern office environment to determine whether or not music had the same beneficial effects in the office space as it did in a factory setting. Karageorghis and Priest (2012) worked on the Psychobiological Model of Music, a model which details how there are 3 main pathways through which music influences human behaviour - “arousal regulation, affective modulation and attentional focus.” Firstly, by enhancing physiological arousal, music can help individuals reach an optimal level of performance during tasks which require serious persistence as discussed earlier. Next, affective modulation is essentially the ability music has to improve positive affect using melody, harmony and emotional tone. This can significantly improve our mood, which in turn improves our performance. Finally, the component of attentional focus which is based on more foundational or concrete elements of music like tempo and rhythm, is a notable help during tasks where individuals typically experience high levels of boredom. With the correct tempo or rhythm, music can reduce the feeling of exhaustion, allowing the individual to persist with determination.

Another piece of research carried out by Lesiuk (2005), also explained how listening to music in the workplace can improve positive affect, reduce employee stress and improve quality of work. In this study she focused on software developers and found that those who listened to music during tasks carried out higher quality work and described being in better moods than when they worked without music. Once again, this aligns with the general beliefs within organisational psychology which prove that more positive emotional states are associated with generating better creativity, job satisfaction and problem solving. (Fredrickson, 2001)

Unfortunately, it is not all positive when it comes to music in an organisational context. Like most things, the effects of music in the workplace are not entirely beneficial. There is significant evidence to show that the effects of background music depend significantly on the nature of the task at hand. (North & Hargreaves, 1999). As detailed above, it tends to be routine tasks with repetitive actions that benefit the most from using music as a motivator. On the other hand, more complex activities requiring deeper levels of concentration could actually be negatively affected, usually when the music contains lyrics or has a high complexity (Perham & Currie, 2019).

Similarly, Salamé & Baddeley (1989) and Furnham & Strbac, (2002), both highlighted some of the key drawbacks of listening to music in the workplace. Their research demonstrates how music often impairs employee performance, particularly during tasks which require “prolonged concentration, verbal reasoning or working memory.” Haake (2011), surveyed employees

regarding listening to music in the workplace and while many described it as a mood regulator, a significant number reported it to be a distraction.

3.3 Cognitive Effects of Audio

The cognitive impact of music is a more complicated topic and it heavily depends on the context of the situation. Generally speaking, research claims that music can both enhance and weaken performance, depending on the characteristics of the audio and the nature of the task itself. In other words, different types of music are suited to different variations of tasks. It has been found that the audio has different effects depending on whether or not the participant is completing a simple repetitive task or a more complex, highly cognitive one.

For example, research has shown that oftentimes, music can improve performance during routine, monotonous tasks like data entry or assembly work (Fox & Embrey, 1972) due to its ability to motivate individuals and delay boredom. However, it has been proven to impair individual performance on tasks requiring deeper levels of concentration or language processing. (Salamé & Baddeley, 1989).

Shih, Huang and Chiang (2012) found that enhanced focus can be achieved through the use of instrumental, low complexity music. They found this was especially true for tasks requiring extended periods of focus. Their research supports the Load Theory of Attention (Lavie, 1995) which states that low complexity audios can reduce the impact of distractions normally present in the surrounding area.

Following on from this, North and Hargreaves (1999) found that high tempo or lyrical music can hinder performance during tasks that require accuracy, reading comprehension or verbal reasoning. This is due to the lyrics competing with our linguistic processing. In other words, the lyrics interfere with our ability to perform with accuracy and reduce our reaction time. Cognitive Interference Theory (Sarason, 1996) reflects these ideas as it states that competing verbal distractions interfere with working memory and our ability to control our attention.

The Yerkes - Dodson Law (Yerkes & Dodson, 1908) relates to this point above. This law states that performance can improve due to physiological arousal but only to an optimal point. In this case, this arousal would be caused by the music played for the participant and would result in improved cognitive performance. However, music that is considered too stimulating due to high tempo or containing too many lyrics would most likely push individuals over this optimal level, especially if they are required to complete analytical or complex tasks (Teigen, 1994).

3.4 Importance of Audio Type

One of the key components of this study is the audio characteristics in each variation of background audio used. This includes factors such as tempo, lyrics, complexity and familiarity.

A new feature that has been introduced to the conversation in recent years is AI generated or enhanced audios, which can have the ability to tailor to the specific needs of the individual and their preferred or ideal audio characteristics to create a more personalised environment of concentration.

Audio Characteristics:

Tempo

This is one of the most influential elements of music on an individual's attention and arousal. Slow tempo which is any audio that is 60 - 80 beats per minute (or BPM) is usually considered a relaxing tempo which can help participants sustain attention for extended periods of time. Studies have shown this may be due to how slower rhythms have the ability to synchronise with our heart rate and breathing patterns, which encourages calmness and regulates our nervous systems. This can help with activities which require long periods of focus and concentration. (Husain, Thompson & Schellenberg, 2002).

In contrast to this, fast tempo audios (higher than 120 BPM) increase physiological arousal and as a result, can reduce accuracy (Husain, Thompson & Schellenberg, 2002). While this increased arousal and motivation may be useful for simple tasks or activities requiring high intensity or energy, it can seriously harm an attempt at completing more complex tasks which require accuracy and high levels of concentration. As mentioned earlier, this high tempo music may push individuals past the optimal point of arousal, leading to decreased precision and a higher number of errors during a cognitively demanding task. (Yerkes & Dodson, 1908; Husain et al., 2002).

Lyrics

Music containing lyrics has been proven repeatedly to impair cognitive tasks, especially those involving writing or language processing, like a reading comprehension followed by questions for example. Research has proven that lyrics directly interfere with our verbal processing, which is what makes these audios one of the worst options for attempting to achieve concentration. Ransdell and Gilroy (2001) conducted a study which highlighted that students who listened to lyrical music performed much worse than those who used instrumental music or simply silence. It is clear that the more favourable and beneficial option tends to be instrumental music without lyrics as it doesn't contain the same distractive traits. (Ransdell & Gilroy, 2001) This study links closely to the Cognitive Interference Theory (Sarason, 1996) mentioned previously, which suggests that verbal stimuli, in this case lyrics, use the same cognitive resources needed for linguistic tasks. This explains that when we hear lyrics during a task requiring linguistic skills or intense focus, the words in the song take our attention away from the words or information in the task, which of course reduces our ability to perform with accuracy and strong focus.

Complexity

Audio backgrounds are generally considered complex if they contain features such as unpredictable patterns or a high number of changes. These complexities add to our cognitive load and as a result, tend to hinder cognitive performance due to the increased strain on our processing abilities (Kostagiolas, Lavranos, & Korfiatis, 2023). In contrast, music with simple, repetitive patterns help to support concentration and therefore improve performance. (Kämpfe, Sedlmeier & Renkewitz, 2011).

A study by Perham and Currie (2019) illustrated that “changing state” music, or music with lots of changes and unpredictability, disrupts our memory abilities significantly more than “steady state” music. A similar study by Dolegui (2020) also found that reaction time and precision are impaired by complex music during tasks requiring high levels of attention.

Familiarity

The effects of familiarity in the cognitive effects of music is a more context dependent subject. Some research argues that music which is familiar to the individual can improve mood, motivation and overall enjoyment when completing a task. Bidelman & Feng (2025), found that familiar music can actually reduce mind wandering and mental uncertainty, leading to a more focused, attentive performance. It has also been shown that the emotional engagement that occurs as a result of listening to familiar music reduces cognitive effort. This is due to the fact that familiar stimulants require less processing in our brains (Sternin, et al, 2021).

Personal Preference

When writing about the effects of music on performance, one must consider personal preference. Each of us has a different set of factors and standards that determines whether or not we believe a song to be good or enjoyable. While this ties into the familiarity factor, it must be noted that just because a song is familiar, that doesn't mean we actually want to listen to it or that it provides the optimal level of motivation (Gómez - Rivas et al, 2023). Research has shown that when an individual listens to their preferred music, this can strengthen their performance due to the enhancement of emotional regulation, stamina and overall motivation (Cassidy & MacDonald, 2007). This allows tasks to feel more enjoyable and less strenuous which can improve cognitive flexibility and attention span (Kühnis & Elmer, 2021).

3.5 Artificial Intelligence Generated Audios & Adaptive Audios

In recent years, there has been emerging research conducted on the use of adaptive audio which is audio often generated with the help of artificial intelligence and computer models to generate an audio environment ideal for focus and ensuring minimal distraction (Westermann & Riedel, 2020). These soundscapes are often generated by using audio characteristics that help to enhance

concentration, such as low complexity and non lyrical audios. As mentioned before, these characteristics can be extremely useful for complex tasks or activities requiring linguistic skills.

Findings by Yirka (2025), highlight the growing interest, both public and scientific, into AI generated focus audio. This study highlighted how cognitive performance can be enhanced using AI workflow audio as it provides a low complexity, stable environment and is specifically designed to reduce cognitive load and improve focus levels. This demonstrates the potential value that AI generated audios could have in the workplace, especially these days when employees are faced with countless distractions.

A relatively recent study that investigated the impact of AI generated audio environments and found that “AI generated ambient sound improved accuracy on complex problem-solving tasks” (Zhou et al, 2022). It is clear that there is definitely a place for these artificially generated audios in the workplace, especially in jobs requiring frequent problem solving and intense concentration. This research also supports the idea that the type of music or audio that is present during a task can be helpful or damaging depending on the type of work or thinking taking place. There is evidence to support that lyrical, upbeat music can be beneficial in more routine, repetitive tasks (Fox & Embrey, 1972), while there is also proof that slower, less complex audios can be equally beneficial when it comes to problem solving based tasks which require intense focus and minimal distraction (Kämpfe, Sedlmeier & Renkewitz, 2011).

3.6 The PLOS One Study (Orpella et al., 2025)

This study entitled “Effects of Music Advertised to Support Focus on Mood and Processing Speed”, published in PLOS One - a peer reviewed open access scientific journal, contains key evidence on the effects of differing audios on both reaction time and mood. While most studies regarding the impact of background audio focus on either performance or mood as separate entities, this study first used the PANAS scale to measure mood changes before and after the task. In other words, there are many studies that measure the impact of music on performance (accuracy & reaction time) or they measure the effects of music on emotional state, but very rarely both at the same time. This is why the PLOS ONE Study provides extra insight into why the performance results vary in each different audio environment, whether the participant performance is altered by cognitive factors, emotional factors or a combination of both. The PLOS ONE study differentiates itself because it measures mood and performance simultaneously. This approach allows the researcher to investigate whether improvements in mood are directly associated with improvement in cognitive performance, instead of only reporting the outcomes without the context and nuance behind it.

Table 1

Summary of PANAS Scale			
Component	Description	Scoring	Interpretation
Positive Affect (PA)	10 positive emotion adjectives (e.g., interested, excited, inspired)	Rated 1–5; averaged to produce PA score	Higher PA = improved mood Lower PA = reduced positive emotion
Negative Affect (NA)	10 negative emotion adjectives (e.g., distressed, upset, nervous)	Rated 1–5; averaged to produce NA score	Higher NA = increased stress Lower NA = reduced negative emotion
Pre-Task Scores	Baseline emotional state before audio exposure	PA_before, NA_before	Used as comparison point
Post-Task Scores	Emotional state after audio + Flanker Task	PA_after, NA_after	Shows immediate emotional impact
PA Change	PA_after – PA_before	Positive value = mood improvement	Negative value = mood decline
NA Change	NA_after – NA_before	Positive value = worsened mood	Negative value = reduced stress
Mood Interpretation	Combined meaning of PA and NA changes	Evaluates emotional impact of each audio condition	Allows comparison across the four audio environments

Source: Created by Author, 2026

The PANAS scale is a standard before and after measure of positive and negative affect. It has 20 adjectives describing participants' emotions. 10 Positive - Interested, excited, strong, inspired, determined, active, alert, attentive, enthusiastic, proud. 10 Negative - Distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid. Participants rate each word on a Likert scale 1–5 (1 = Very slightly or not at all 5 = Extremely). They then find the average Positive Affect and Negative Affect. Positive Affect (PA) score is the average of the 10 positive emotions and Negative Affect (NA) score is the average of the 10 negative emotions. Total Mood Change is then calculated (PA – NA) to represent overall mood improvement or decline.

Reaction time is then found using a cognitive test called a Flanker Task which is a tool used to measure participant focus, attention and ability to pick out relevant information while ignoring distractions. This is done by analysing reaction speed and selective attention of participants. The test involves showing participants a series of stimuli. Most often it is either arrows or letters that are used and participants must respond as quickly and accurately to determine the direction of the middle arrow/letter. Therefore they must focus on one piece of key information while

identifying the other information on the screen as irrelevant. Participants are shown either a congruent sequence where all the arrows are facing the same direction (>>>>>) or an incongruent sequence where the middle arrow is facing the opposite direction to the surrounding arrows, also known as “flanker” arrows (>> <>>).

Once these results were collected, a comparative analysis between the two sets of data was conducted to determine whether or not there was a correlation between change in mood and reaction time using different audio backgrounds.

This study was a key element of secondary research as it compared 4 different audio types:

1. Work Flow (AI-generated)
2. Deep Focus (instrumental)
3. Pop Hits (lyrical)
4. Office Noise (baseline)

The results demonstrated that the AI generated “Work Flow” audio produced the most improvement in both performance and mood. This research suggests that there may be a new way to enhance concentration through the effective use and prompting of AI audio tools.

3.7 Broader Perspectives on Attention, Focus and Workplace Performance

While there is plenty of existing research related directly to the effects of music or audio on performance, there is also significant literature which highlights how attention, cognitive load and environmental conditions affect productivity in the workplace. The addition of these perspectives allows for a more comprehensive understanding of why specific audio environments improve or impair performance.

Multitasking & Interruptions

Interruptions, notifications and changes in priorities are part of the modern workplace. These interruptions are a key factor that cause increased stress levels and reduced accuracy, even if they are brief (Mark et al. 2008). These days digital notifications have also become a part of daily life in the workplace. These notifications, while short, have been found to significantly weaken performance and reduce sustained attention (Rosen et al, 2011). This study examined the effects of text message disruptions in college lectures and found that these notifications considerably impaired focus through what they refer to as a “Task Shifting Penalty”. External distractions, whether it’s audio or digital can have a serious impact on performance. This research demonstrates the importance of creating a controlled sensory environment, ensuring it is as suitable as possible for the task at hand.

Environmental Noise and Workplace Design

Environmental psychology research highlights that workplace design actually has a strong influence on concentration. For example, it has been found that open plan offices notably impair employee performance as they reduce privacy and worsen mood due to noise related distractions, especially because employees cannot control nearby conversations or activity (Kim & Dear, 2013). A similar study conducted by Banbury and Berry (2005), found that irrelevant speech is one of the most disruptive forms of background noise. This includes distractions such as background conversation, other people's phone calls or peers discussing irrelevant topics. These interruptions are unrelated to the employee's task but are still processed by their brain, which causes cognitive strain and oftentimes provokes feelings of stress.

Research has also been conducted on restorative environments, which explains that exposure to natural elements like plants, images of nature or natural soundscapes can improve attention and focus (Kaplan, 1995). Attention Restoration Theory (Kaplan, 1995) suggests that mental fatigue can be reduced by spending time in natural environments instead of the usual office atmosphere that many people are accustomed to. Even short exposure to nature imagery has been found to improve attention spans (Berto, 2005). These studies broaden the perspective on workplace design and atmosphere by demonstrating that sensory environments, including audio, have an important influence on cognitive performance.

3.8 Gaps in the Literature

While there is extensive research completed on this topic, some of it is quite outdated and lacks an in depth analysis of important factors and correlations:

Limited research on the impact of AI generated audio on mood and performance

Most existing research I could find focuses exclusively on traditional audios and music genres. There hasn't been a huge amount of investigation into the effects of AI generated or adaptive audios which are designed specifically for focus. Current findings are positive but more in depth and long term analysis needs to be conducted in order to understand the true potential of this tool.

Lack of Measuring Mood and Performance Simultaneously

The majority of studies I came across measured the impact of audio on mood as one entity and the impact of audio on performance as a completely separate entity. For example, much of the research in this area involved measuring an improvement or decline in performance based on differing audio environments. However, many studies failed to analyse exactly why the music had these significant effects on results. They did not properly investigate the correlation between

participant mood and performance. In other words, studies either examine emotional impact or cognitive impact of audio but rarely both, or whether or not one affects the other.

Individual Differences often Ignored

Personality factors such as introversion versus extroversion for example, are often overlooked in these studies. When it comes to practical investigations and primary research, key individual differences such as music preferences and familiarity are often overlooked, even though they can play a key role in the outcome of the experiment.

Realistic Work Environments are Rarely Recreated Accurately

A large amount of this research is more often than not conducted in a laboratory environment with artificial tasks. This isn't an accurate representation of the workplace where we often face unexpected interruptions, multitasking and varying levels of noise throughout the day. Therefore, there is a lack of research to show how these audios would actually affect an employee on a regular day at work.

4. Data Description

4.1 Abbreviations

Table 2

Abbreviations Table		
Abbreviation	Meaning	Explanation
PA	Positive Affect	Average score of the 10 positive PANAS items
NA	Negative Affect	Average score of the 10 negative PANAS items
TMC	Total Mood Change	PA - NA (higher = improved mood)
BPM	Beats Per Minute	Tempo of Audio - High BPM = Fast
PANAS	Positive and Negative Affect Schedule	Standardised mood measurement scale

Source: Created by Author, 2026

4.2 Primary Data Description

Participant Demographics

Table 3

Participant Demographics	
Category	Description
Sample Size (N)	25
Age Range	20 - 54 Years of Age
Mean Age	25.56 Years
Gender Distribution	56% Female, 44% Male
Education Level	University Students, Employees
Sampling Method	Convenience sampling, voluntary participation
Inclusion Criteria	Normal hearing, fluent in English, no cognitive impairments
Exclusion Criteria	Hearing disorders, not fluent in English

Source: Created by Author, 2026

Participants were adults aged 18 - 54 who frequently engage in computer based work either as part of their studies or full time job. Recruitment was conducted through convenience sampling using social media, colleague networks and word of mouth. As seen above, the average age and inclusion criteria indicate that this sample is representative of English speaking young adults with normal hearing and no cognitive impairments. This information creates the baseline characteristics of individuals whose performance and mood were analysed.

Assigned Audio Background

To summarise the main characteristics of each audio condition, Table 4 provides an overview of the four audio types, including their main features and the expected impact of each one on cognitive ability.

Table 4

Audio Type			
Audio Type	Description	Key Characteristics	Expected Cognitive Effect
Work Flow (AI-Generated)	Adaptive audio created by AI for focus	Low complexity, no lyrics, stable rhythm	Improved focus, reduced distraction
Deep Focus (Instrumental)	Non-lyrical ambient music	Slow tempo (60–80 BPM), repetitive patterns	Supports sustained attention
Personal Preference (Lyrical)	Familiar songs with lyrics	High familiarity, high tempo, verbal content	Interferes with linguistic tasks
Silence / Office Noise (Baseline)	No added audio	Natural environmental noise	Neutral or slightly distracting

Source: Created by Author, 2026

This summarises the four audio conditions used in the experiment and highlights the characteristics most relevant to cognitive performance. AI generated audio and instrumental music are both low complexity audios with no lyrics, and are therefore associated with improved focus and reduced cognitive load. However, the personal preference audio contains lyrics which interferes with verbal processing. This makes it less suitable for tasks such as the Flanker task which require attention and accuracy. The silence/office noise acts as a neutral baseline in order to compare performance with natural conditions.

Variables & Measurements

Table 5

Variables & Measurements			
Variable	Type	How It Was Measured	Unit
Positive Affect (PA)	Dependent	PANAS pre/post	Score (1-5)
Negative Affect (NA)	Dependent	PANAS pre/post	Score (1-5)
Total Mood Change	Dependent	PA – NA	Score difference
Reaction Time	Dependent	Flanker Task	Milliseconds (ms)
Accuracy	Dependent	Flanker Task	Percentage (%)
Audio Condition	Independent	Assigned audio type	Categorical
Participant Preference	Moderator	Self-reported	Categorical
Task Completion Time	Dependent	Time to finish Flanker Task	Seconds

Source: Created by Author, 2026

4.3 Secondary data

- PLOS One dataset on mood and processing speed
- Additional peer reviewed findings on music, organisational behavior and cognitive function as discussed in Literature Review

Discussion of PLOS One Dataset

The study revealed the AI generated Work Flow audio generated a 76% mood improvement which was significantly higher than the alternative audio environments. The Deep Focus instrumental audio produced a 44% mood improvement, followed by the Pop Hits lyrical music and Office Noise only receiving approximately a 36% increase. These results propose that non lyrical, adaptive audio could be the most effective at regulating emotions during intellectual tasks.

Similarly, the Work Flow audio also resulted in the highest performance improvement showing an 8-13% increase. Deep Focus instrumental was next with a 3-5% improvement and finally Pop Hits with lyrics produced only a 0-2% improvement. The Office Noise acted as a baseline for the performance level.

These outcomes support the theory that:

- Instrumental music is beneficial to focus levels
- Lyrical music can distract and reduce cognitive ability
- Adaptive audio may enhance concentration and information processing

The pattern between changes in mood and performance in this study demonstrate a strong correlation between mood and performance. It highlights the possibility that audio that improves emotional state can as a result improve cognitive performance.

This PLOS One Dataset serves as a strong foundation for this study for a number of reasons:

- Provides a good baseline and benchmark for comparison
- Supports the use of different audio types
- Promotes the importance of measuring both mood and performance changes
- Highlights the possible benefits of AI audio to cognitive function

5. Methodology

This study will adopt a mixed-methods approach, combining both primary and secondary research and using quantitative and qualitative methods to provide a well-rounded review of how music influences employees' productivity and focus. Each participant completed the task in 4

different audio environments: AI Generated Focus Audio, Instrumental Music, Personal Preference Music and Silence.

5.1 Research Design

Quantitative Research: This will consist of a controlled experiment using an Eriksen Flanker task which is used to measure attention, response inhibition, and cognitive control under the varying audio backgrounds.

Qualitative Research: There will be qualitative questions asked to determine participants preferences and perceived effectiveness of music on their concentration and preferences.

5.2 Primary Research

Participants will be randomly assigned to one of four audio conditions:

- 1) AI Generated Focus Audio
- 2) Instrumental
- 3) Personal Preference
- 4) Silence/Office Noise - acts as a baseline

Experiment:

- 1) Complete mood assessment (using PANAS Scale) before listening to any audio
- 2) Listen to the assigned audio for a short period before completing cognitive Flanker task
- 3) Complete cognitive task with assigned audio
- 4) Complete mood assessment (using PANAS Scale) after listening to audio and completing Flanker task
- 5) Post assessment interview gathering participant subjective insights and opinions on the various audio conditions

Performance Measure

Participant performance was assessed using two main measures based on the Flanker Task - Accuracy and Reaction Time. These measures break down two key aspects of cognitive function. Accuracy illustrates the participants' ability to identify target stimuli (in this case arrows) while ignoring other Flanker arrows presented to distract. Reaction time captures the speed of information processing and response execution.

Table 6

Performance Measures Summary			
Component	Description	Scoring	Interpretation
Accuracy	Percentage of correct responses in the Flanker Task	Calculated as $(\text{Correct Trials} \div \text{Total Trials}) \times 100$	Higher accuracy = Better focus and attentional control Lower accuracy = Increased distraction or cognitive interference
Reaction Time (RT)	Average time (ms) taken to respond to each stimulus	Mean RT calculated per condition; outliers removed	Faster RT = Efficient information processing or speed/accuracy trade off Slower RT = Higher cognitive load/distraction or more deliberate/cautious processing
Performance Interpretation	Combined meaning of accuracy and RT difference under each audio condition	Evaluates overall cognitive efficiency under each audio condition	Allows comparison of attentional performance across the four auditory environments

Source: **Created by Author, 2026**

Accuracy was calculated as the percentage of correct responses out of the total number of trials in the Flanker Task. Higher accuracy scores indicate better selective attention as participants have to ignore the flankers designed to distract.

Reaction time was measured in milliseconds and it displays the time taken from when the arrows were presented to the participant's keypress. A faster reaction time can indicate more efficient information processing or strong arousal levels depending on the audio used. Slower reaction times may indicate increased cognitive load or possible more deliberate processing.

In order to evaluate overall performance across the four varying audio conditions, accuracy and reaction time were analysed and compared across each condition. These results determined the interpretation of how AI workflow audio, instrumental music, silence and personal preference music influenced participant performance. Higher accuracy levels combined with moderate or slower reaction times were interpreted as improved cognitive function, while low accuracy levels combined with fast reaction times were interpreted as having a speed/accuracy trade off and therefore impairing cognitive function.

Mood Measure

Participant mood was assessed using the PANAS scale, which measures Positive Affect (PA) and Negative Affect (NA). This process has a number of elements such as scoring and interpretation which are summarised in the table below.

Table 7

Mood Measures Summary			
Component	Description	Scoring	Interpretation
Positive Affect (PA)	10 adjectives describing positive emotional states	Rated 1-5; summed to produce PA score (≈24-34)	Higher PA = improved mood Lower PA = worsened mood
Negative Affect (NA)	10 adjectives describing negative emotional states	Rated 1-5; summed to produce NA score (≈10-22)	Higher NA = more stress/negative emotion Lower NA = reduced stress
Pre-Task Scores	Baseline emotional state before audio exposure	PA_before, NA_before	Used as comparison point
Post-Task Scores	Emotional state after audio + Flanker Task	PA_after, NA_after	Shows immediate emotional impact
PA Change	PA_after - PA_before	Positive value = mood improvement	Negative value = mood decline
NA Change	NA_after - NA_before	Positive value = increased stress	Negative value = reduced stress
Mood Interpretation	Combined meaning of PA and NA changes	Evaluates emotional impact of each audio condition	Allows comparison across the four audio environments

Source: Created by Author, 2026

The PANAS (Positive Affect and Negative Affect Schedule) was used to assess participant mood. As mentioned previously, it has 20 adjectives describing participants' emotions. 10 assess Positive Affect or PA and 10 assess Negative Affect or NA. Each emotion is rated from 1 -5 on a Likert scale. The scores for each were added to produce a PA score (range ≈ 24 - 34) and an NA score (range ≈ 10 -22). The mood change for PA and NA were found separately. Pre task scores were subtracted from post task scores in order to determine the change in PA and NA after completing the task in the 4 different audio conditions.

An increase in PA signifies an improvement in mood, while an increase in NA would indicate poor mood and elevated stress levels. Similarly, a decline in PA would imply a worsened mood while a lower NA suggests a reduction in stress and other negative emotions. This tracking of mood provides the opportunity to make a direct comparison of how each auditory environment impacted the emotional state of participants throughout the experiment.

Participants

Participants were adults aged 18 - 54 who frequently engage in computer based work either as part of their studies or full time job. Recruitment was conducted through convenience sampling using social media, colleague networks and word of mouth. As seen above, the average age and inclusion criteria indicate that this sample is representative of English speaking young adults with normal hearing and no cognitive impairments. This information creates the baseline characteristics of individuals whose performance and mood were analysed.

Materials

Audio Conditions

4 different audio environments were used in the experiment:

- 1) AI Generated Workflow Audio (brain.fm)- non lyrical, focus soundscape designed to enhance concentration
- 2) Instrumental Music - Non lyrical, classical music, low complexity
- 3) Personal Preference - participants chose a song provided it contained lyrics & they were already familiar with the song.
- 4) Silence - no audio playback, acts as a baseline

These various audios aimed to represent the range of conditions that are commonly found in a professional or academic environment.

Performance Task (Flanker Task)

Cognitive performance was measured using a Flanker task. Participants responded to the direction of a central arrow while having to ignore the flanking distractor arrows on either side of the central focus. Both accuracy and reaction time were calculated to measure participant performance. There were a total of 16 rounds in the Flanker task so participant accuracy was measured by how many questions they answered correctly out of the 16 and then rounded to the nearest percentage (range \approx 31% - 100%). Average reaction time was measured and recorded in terms of seconds (range \approx 0.2s - 1.3s).

Qualitative Measures

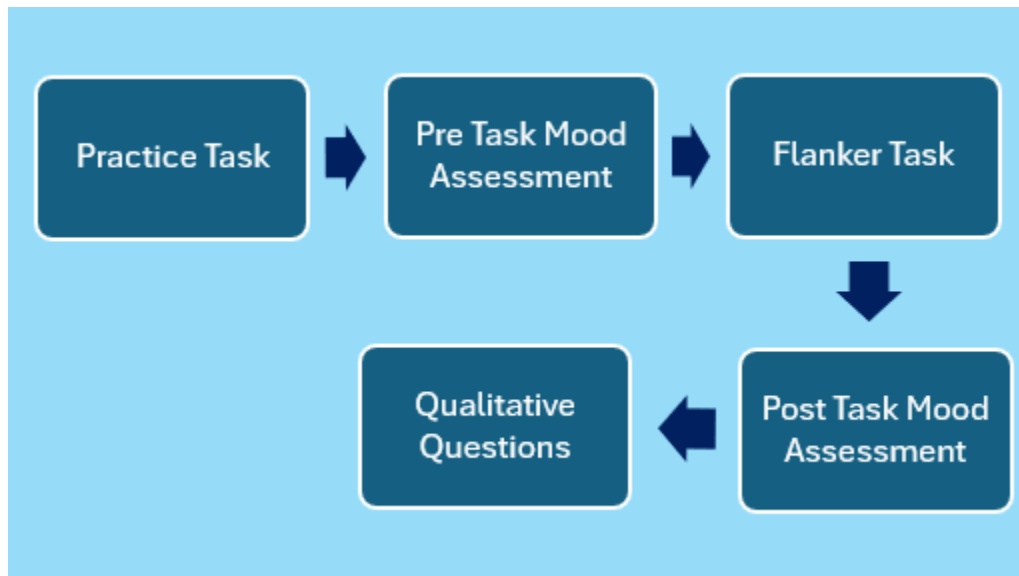
Participants engaged in a brief interview after each audio condition in order to provide a more well rounded insight into the effects of each audio environment. They were questioned on the following prompts:

- 1) Perceived distraction or focus
- 2) Preferences between audio types before and after task completion

These qualitative responses provided more nuanced context for the qualitative results that had been gathered.

5.3 Experimental Procedure

Table 8



Source: Created by Author, 2026

The experiment was conducted by each participant individually. Each person had to be in a quiet room and have access to either headphones or earphones in order to listen to the audio provided. The participants completed the Flanker task in the 4 differing audio conditions with the order of each audio randomised each time in order to avoid skewed data due to the audio order. This confirmed that the mood and performance differences were due to the audios themselves and not the order in which they were used. For this study participation was completely voluntary, anonymous and fully transparent. No sensitive personal data was collected or stored.

Table 9

Experimental Procedure		
Step	Component	Description
1	Practice Task	Participants completed a short practice Flanker trial to familiarise themselves with the instructions, response keys, and timing. No data from this practice round was recorded or used in the analysis.
2	Pre-Task PANAS Mood Test	Before each audio condition, participants completed a PANAS assessment to record baseline Positive Affect (PA) and Negative Affect (NA). This step was repeated four times (once per audio condition).
3	Flanker Task – Performance Measure	Participants completed the Flanker Task under each of the four audio conditions. Accuracy and reaction time were recorded for every condition to allow direct performance comparison.
4	Post-Task PANAS Mood Test	Immediately after each Flanker Task, participants completed the PANAS again. Mood change scores were calculated by subtracting pre-task PA/NA from post-task PA/NA.
5	Post-Task Interview	Participants answered a short series of qualitative questions to provide subjective insights into their experience under each audio condition.

Source: Created by Author, 2026

1. Practice Task

Before actually completing the official Flanker tasks, each participant took part in a short practice trial that allowed them to familiarise themselves with the instructions, response keys and timing of the task. This prevented any discrepancies due to unfamiliarity with the task itself. None of the results from this practice trial were recorded or used in the final analysis.

2. Pre Task PANAS Mood Test

Before completing the Flanker task in each audio condition, participants completed a short PANAS mood assessment. This provided the PA and NA for each person before completing the task. As there were 4 different audio conditions, this step was repeated 4 times, once before each new audio was introduced.

3. Flanker Task - Performance Measure

Each participant completed the Flanker task 4 different times - once for each audio condition. Their reaction time and accuracy were recorded for each environment. This allowed for a direct comparison of performance under each audio.

4. Post Task PANAS Mood Assessment

Participants then completed the post task PANAS mood test immediately after completing the Flanker task. This provided their PA (Positive Affect) after and NA (Negative Affect) after mood results. Their change in mood scores were calculated by finding the difference between the “Pre Test PANAS” and “Post Task PANAS” assessments. These results revealed the emotional impact of each audio background.

5. Post Task Interview

After the task, participants answered a short series of questions to provide more qualitative insights to the study. This added a more subjective element to the study which seemed to be missing from many other studies on this topic.

Perceived Focus/Distraction

Table 10 explains the self reported levels of focus or distraction under each audio condition. Participant responses were categorised as either “Focused, Neutral or Distracted” in order to determine how participants felt each audio impacted their attention. This provided a more qualitative and personal insight into how different audio environments impacted subjective concentration.

Table 10

Perceived Focus/Distraction				
	AI	Instrumental	Personal Preference	Silence
Focused	18	13	0	7
Neutral	7	12	8	18
Distracted	0	0	17	0

Source: Created by Author, 2026

The table demonstrates the different perceived focus of participants across the varying audio conditions. The AI generated audio resulted in the highest number of “Focused” responses (18), which informs us that participants felt most comfortable concentrating in this environment. Instrumental music also appeared to support participant focus with 13 participants answering “Focused”, while silence resulted in the majority of participants (18) answering “Neutral” so

they felt neither more focused or distracted by the silence which makes sense as this is a standard baseline for most people. On the other hand, the personal preference audio led to 17 out of the 25 participants feeling “Distracted”. This suggests once again that lyrical or personally chosen audios with problematic characteristics can impair focus and accuracy when completing a cognitive task, while AI generated focus audio and instrumental music can stimulate a more consistent state of focus.

Participant Audio Preference Before & After Task

Table 11 below summarises participants’ preferred audio before and after completing the Flanker Task. This explains how exposure to the various audio environments influenced the subjective preferences of participants. Comparing pre and post task preferences highlighted which audio environments were found to be most supportive of focus and performance by the participants themselves.

Table 11

Participant Audio Preference		
Audio	Before Task	After Task
AI	2	13
Instrumental	8	9
Personal Preference	10	0
Silence	5	3

Source: Created by Author, 2026

The table displays a visible change in participant audio preferences after completing the Flanker task. Before the task, many participants (10) claimed they would choose their personal preference audio to complete a cognitive task and only 2 selected the AI generated focus audio as their audio preference. However, after completing the task, these preferences switched significantly, with 13 participants selecting AI generated audio as their focus environment of choice. Instrumental music remained consistent increasing from 8 to 9 participants, while personal preference music dropped dramatically to 0, indicating that the majority of participants found this lyrical audio to be somewhat distracting. Silence also slightly declined, suggesting that participants found a more structured audio background more beneficial to their focus and performance than no sound at all. In summary, these qualitative questions provided a more subjective insight into the most effective audio environments and further supported the findings that both the AI generated audio and instrumental music were the most effective for supporting concentration and task engagement.

Summary of Procedure

To summarise, each participant completed the following steps 4 times - one for each audio environment

- 1) Pre Task PANAS Test - provided baseline mood
- 2) Flanker Task - measures accuracy & reaction time
- 3) Post Task PANAS Test - to calculate mood change
- 4) Post Task Interview - to provide qualitative insights

Secondary Research

Secondary data will support the findings by reviewing existing academic literature on music and productivity, psychological response to varying audios, and workplace motivation. Examples of key sources include academic journals, psychology research, and organizational studies that examine how background music impacts employee performance in professional settings.

6. Results

The results of the Flanker Task, PANAS Mood Assessments and the correlation between mood change and cognitive performance are presented below. As mentioned, these results are a reflection of participants' mood and performance in the 4 varying audio environments: AI generated workflow, instrumental, personal preference and silence.

6.1 Flanker Task Accuracy

TABLE 12A:

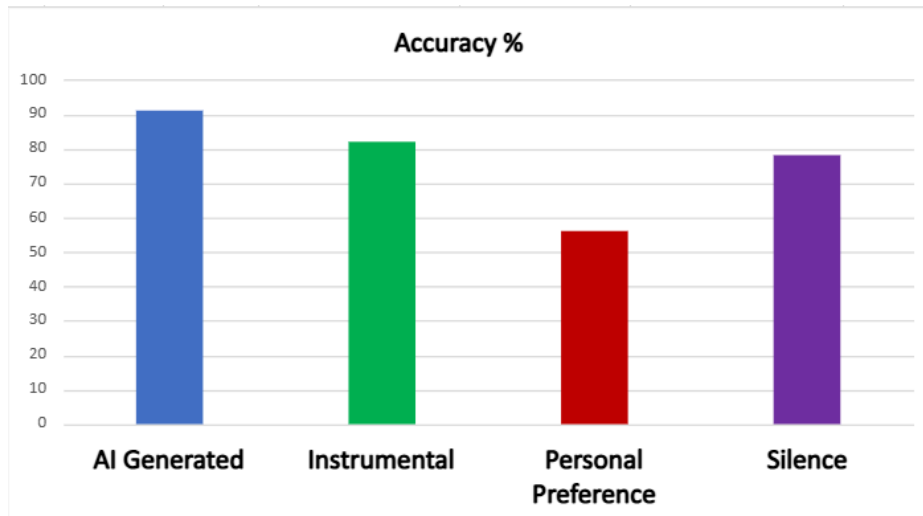
Flanker Task Accuracy		
Audio	Mean	Standard Deviation
AI Generated	91%	0.095
Instrumental	82%	0.144
Personal Preference	56%	0.137
Silence	78%	0.114

Source: Created by Author, 2026

Table 12A displays the average accuracy levels under each audio condition ranging from 0% to 100%. This indicates how many of the target arrows participants were able to correctly identify the direction of during the Flanker task. It reflects their ability to keep focused and respond accurately while ignoring distractions. A higher mean accuracy indicates better task performance. The table highlights that when participants listened to AI generated audio they

achieved the highest accuracy (91%). This implies that it provided participants with the highest ability to focus and complete the task accurately. Instrumental music has a similar effect, achieving an accuracy level of 82%. Silence also produced a relatively high but not as impressive accuracy level of 78%. However, the personal preference audio had a drastically lower average accuracy of 56%. This would suggest that the verbal content and familiarity in this audio condition interfered significantly with the cognitive function of participants.

TABLE 12B:



Source: Created by Author, 2026

As shown by the results in TABLE 12A and 12B, this study conducted a repeated measures ANOVA in order to determine whether task accuracy was altered as a result of the varying audio conditions. It was established that there was indeed a significant effect on task accuracy depending on the type of audio used. The highest accuracy was achieved when listening to the AI generated workflow audio ($M = 0.91$, $SD = 0.095$). Next was the instrumental music ($M = 0.82$, $SD = 0.144$) and silence ($M = 0.78$, $SD = 0.114$). Finally, accuracy was lowest in the personal preference condition ($M = 0.56$, $SD = 0.137$).

Post task analysis revealed that the AI audio produced significantly higher accuracy results than both the silence and especially the personal preference environments. Similarly, instrumental music also led to high accuracy levels, also notably higher than the personal preference condition. There was not a significant difference between the accuracy levels in the AI workflow audio compared to that of the instrumental audio. Both resulted in very strong accuracy levels, while the silence was slightly lower in its score. However, it is clear that the personal preference audio significantly impaired participant cognitive performance.

6.2 Flanker Task Reaction Time

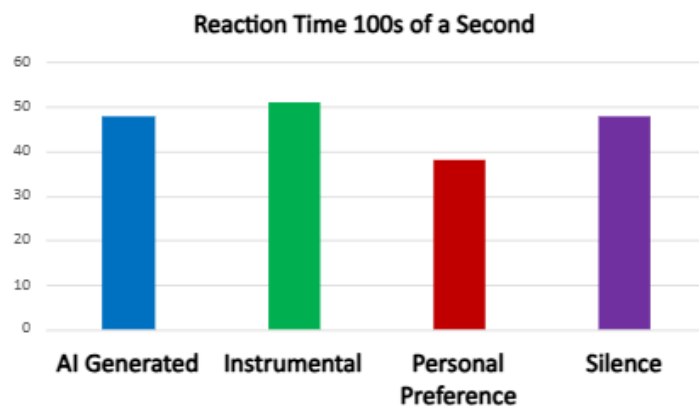
TABLE 13A:

Flanker Task Reaction Time		
Audio	Mean (seconds)	Standard Deviation
AI Generated	0.48s	0.079
Instrumental	0.51s	0.073
Personal Preference	0.38s	0.264
Silence	0.48s	0.085

Source: Created by Author, 2026

Table 13A displays the average reaction time of participants under each audio condition. This represents the speed at which participants were able to identify the direction of the target arrow while filtering out the flanker arrows. A lower time of course indicates faster processing, however, a higher standard deviation indicates more variability and therefore inconsistency. While the personal preference audio may have produced the lowest average reaction time (0.38s), it also had the highest standard deviation (0.264) which suggests a more erratic answer pattern. The AI audio and silence both resulted in more consistent and relatively fast responses as seen by the lower standard deviations of 0.079 and 0.085 and average speed of 0.48s for both audios. The instrumental music produced slightly slower but the most stable reaction times with an average speed of 0.51s and standard deviation of 0.073. In summary, the AI generated audio provided the most balanced combination of speed and consistency, while the personal preference audio produced results that would support the argument of a speed - accuracy trade off.

TABLE 13B:



Source: Created by Author, 2026

The repeated measures ANOVA examined participant reaction time across the 4 different conditions. It was found that speed varied quite significantly depending on the audio type. For example, participants responded quickest in the personal preference condition ($M = 0.38s$, $SD = 0.264$), followed by the AI workflow ($M = 0.48s$, $SD = 0.079$) and silence ($M = 0.48s$, $SD = 0,085$). Finally, the slowest response times on average occurred in the instrumental condition ($M = 0.51s$, $SD = 0.073$).

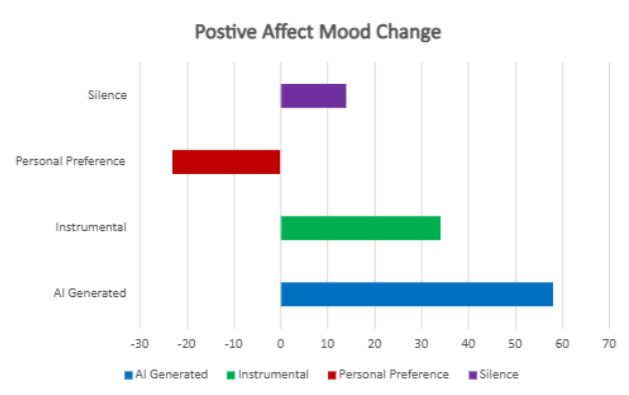
These results indicated that there was a speed/accuracy trade off with the personal preference audio. Participants may have responded quickest using their music of choice, however it came at the cost of a much lower accuracy than the other audio conditions. In contrast to this, AI workflow audio allowed for relatively quick responses while also maintaining the highest accuracy rate.

6.3 PANAS Mood Assessment Results - Positive Affect & Negative Affect

Participant mood scores were calculated by subtracting pre task PANAS scores from post task scores for each of the 4 audio conditions. Tables 14A & 14B display the results gathered for participant mood change and Table 15 highlights the mean and standard deviation of mood changes in both Positive Affect (PA) and Negative Affect (NA).

Positive Affect

TABLE 14A:

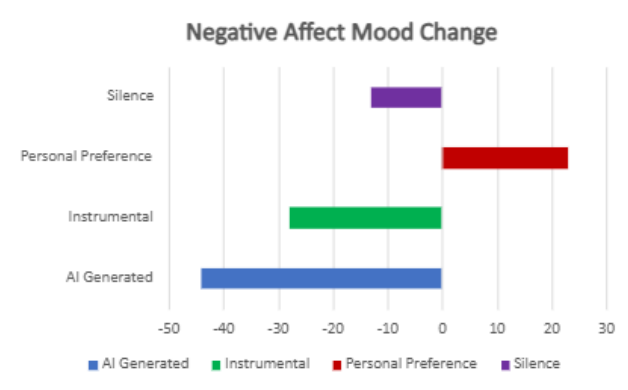


Source: Created by Author, 2026

AI workflow audio produced the highest increase in PA ($M = 5.8$, $SD = 0.41$) indicating it caused strongest and most consistent improvements in participants' mood. Instrumental audio led to a moderate mood improvement ($M = 3.4$, $SD = 0.86$) and silence resulted in a slight increase ($M = 1.44$, $SD = 0.52$). Personal preference however, was the only condition that worsened participant mood with a decrease in PA ($M = -2.32$, $SD = 0.47$).

Negative Affect

TABLE 14B:



Source: Created by Author, 2026

A very similar pattern was found for the changes in NA. AI produced the most significant reduction in NA ($M = -4.4$, $SD = 0.50$), while once again personal preference audio was the only condition that caused a deterioration in participant mood. ($M = 2.28$, $SD = 0.69$). Aligned with the PA results, the instrumental audio produced a moderate mood improvement ($M = -2.84$, $SD = 0.39$) while silence only resulted in a small reduction in NA ($M = -1.32$, $SD = 0.52$).

TABLE 15:

Mood Change				
Audio	Positive Affect		Negative Affect	
	Mean	Standard Deviation	Mean	Standard Deviation
AI Generated	5,8	0.41	-4,4	0.50
Instrumental	3.4	0.86	-2,84	0.39
Personal Preference	-2,32	0.47	2.28	0.69
Silence	1.44	0.52	-1.32	0.52

Source: Created by Author, 2026

To put it simply, the AI generated workflow audio resulted in the highest and most steady improvements in mood overall. It had the highest increase in Positive Affect and reduction in Negative Affect. In contrast, the personal preference audio consistently worsened participant mood as seen by the decrease in Positive Affect and surge in Negative Affect.

6.4 Correlation Analysis

TABLE 16:

Variables Compared	Correlation (r)	Significance (p)
Accuracy ↔ Reaction Time	-0.29	.15
Accuracy ↔ PA Change	+0.41	.04
Accuracy ↔ NA Change	-0.46	.02
Reaction Time ↔ PA Change	-0.18	.39
Reaction Time ↔ NA Change	+0.22	.29
PA Change ↔ NA Change	-0.39	.06

Source: Created by Author, 2026

In order to determine the relationship between mood change and cognitive performance, participant average accuracy, reaction time, PA change and NA change were all used to calculate Pearson correlations. This measures the strength and direction of linear relationships between two variables.

Correlation (r) ranges from -1 to 1 and measures how positive or negative a relationship between two variables is. Values close to -1 signify a negative relationship, while values closer to 1 indicate a positive relationship. A positive relationship indicates that when one variable increases, so does the other. A negative relationship on the other hand would imply that when one increases, the other decreases.

Significance (p) informs us of whether or not the correlation is statistically significant or not. In other words, if the correlation could be random or if it is more likely to be a significant pattern. If $p < 0.05$, the relationship is significant. However, if $p > 0.05$ it would not be considered significant and could just be coincidence.

It was found that there was a significant positive correlation between PA change and accuracy ($r = 0.41$, $p = 0.04$). This implies that when participants experienced a higher increase in Positive Affect emotions, they tended to achieve a higher level of accuracy during the Flanker task. On the other hand, the changes in NA were notably negatively correlated with accuracy ($r = -0.46$, $p = 0.02$). This negative correlation suggests that the increases in Negative Affect emotions were linked to impaired participant performance.

Reaction time displayed a non significant negative correlation with accuracy, $r = -0.29$, $p = 0.15$). While not technically deemed “significant”, this data does support the assumption that there tended to be a speed/accuracy trade off. In other words, faster responses were often linked to poorer accuracy levels.

6.5 Qualitative Results

Perceived Focus/Distractio

Table 17 explains the self reported levels of focus or distraction under each audio condition. Participant responses were categorised as either “Focused, Neutral or Distracted” in order to determine how participants felt each audio impacted their attention. This provided a more qualitative and personal insight into how different audio environments impacted subjective concentration.

Table 17

Perceived Focus/Distractio				
	AI	Instrumental	Personal Preference	Silence
Focused	18	13	0	7
Neutral	7	12	8	18
Distracted	0	0	17	0

Source: Created by Author, 2026

The table demonstrates the different perceived focus of participants across the varying audio conditions. The AI generated audio resulted in the highest number of “Focused” responses (18), which informs us that participants felt most comfortable concentrating in this environment. Instrumental music also appeared to support participant focus with 13 participants answering “Focused”, while silence resulted in the majority of participants (18) answering “Neutral” so they felt neither more focused or distracted by the silence which makes sense as this is a standard baseline for most people. On the other hand, the personal preference audio led to 17 out of the 25 participants feeling “Distracted”. This suggests once again that lyrical or personally chosen audios with problematic characteristics can impair focus and accuracy when completing a cognitive task, while AI generated focus audio and instrumental music can stimulate a more consistent state of focus.

Participant Audio Preference Before & After Task

Table 18 below summarises participants’ preferred audio before and after completing the Flanker Task. This explains how exposure to the various audio environments influenced the subjective preferences of participants. Comparing pre and post task preferences highlighted which audio environments were found to be most supportive of focus and performance by the participants themselves.

Table 18

Participant Audio Preference		
Audio	Before Task	After Task
AI	2	13
Instrumental	8	9
Personal Preference	10	0
Silence	5	3

Source: Created by Author, 2026

The table displays a visible change in participant audio preferences after completing the Flanker task. Before the task, many participants (10) claimed they would choose their personal preference audio to complete a cognitive task and only 2 selected the AI generated focus audio as their audio preference. However, after completing the task, these preferences switched significantly, with 13 participants selecting AI generated audio as their focus environment of choice. Instrumental music remained consistent increasing from 8 to 9 participants, while personal preference music dropped dramatically to 0, indicating that the majority of participants found this lyrical audio to be somewhat distracting. Silence also slightly declined, suggesting that participants found a more structured audio background more beneficial to their focus and performance than no sound at all. In summary, these qualitative questions provided a more subjective insight into the most effective audio environments and further supported the findings that both the AI generated audio and instrumental music were the most effective for supporting concentration and task engagement.

6.6 Summary

Overall, the main findings of this study were that AI workflow audio produced the highest levels of cognitive performance and boosted the emotional state of participants more than any of the alternate audio conditions. Personal preference music led to a deterioration in both performance and participant mood. Finally, both instrumental and silent conditions resulted in moderately positive effects for both mood and performance, however, not as beneficial as the AI workflow.

7. Discussion

The goal of this study was to examine how different variations of background audio influence cognitive performance and emotional state during a task. The findings demonstrate **clear evidence that accuracy, reaction time and mood are all affected by the differing audio environments**. The actual effects vary significantly depending on the type of audio used. The results of the study supported the theory that **non lyrical, low complexity audio, specifically the AI generated workflow audio, improves both cognitive performance and mood while**

completing a task which requires focus. On the other hand, personal preference music containing lyrics impairs both performance and mood in this scenario.

7.1 Interpretation of Cognitive Performance Findings

After conducting the Flanker test and analysing the various results, a clear pattern emerged. **AI generated workflow audio provided the highest accuracy.** Instrumental music resulted in moderately high accuracy. Silence produced slightly lower accuracy, and finally, **personal preference music caused the lowest accuracy.**

These results support **Cognitive Interference Theory (Sarason, 1996)**, which explains that **lyrics distract from verbal processing** which reduces accuracy, especially during tasks such as this which requires substantial focus from the participant. We can see this with the notable drop in accuracy in the personal preference category. The lyrical content in this environment most likely diverted the participants' cognitive function away from the task at hand, resulting in this lower score.

In contrast to this, the AI workflow audio and instrumental music both shared characteristics of **not containing any lyrics and being of low complexity.** This of course, **reduced the cognitive load** of participants and allowed them to place their focus solely on the task, rather than the audio. The **Load Theory of Attention (Lavie, 1995)** would support this finding as it suggests that **low complexity audio environments** serve to **minimise distractions and prolong attention spans.**

7.2 Interpretation of Reaction Time Findings

As mentioned previously, the reaction times of participants suggested there was a **speed - accuracy trade off.** This is evident in the fact that the **fastest reaction times occurred during the personal preference audio,** but this resulted in a **much lower accuracy result.** This indicates that familiar, lyrical music can **increase impulsivity,** leading to quicker but less accurate responses.

AI workflow audio allowed for a **balanced performance.** Participants had **relatively fast** reaction times while also maintaining the **highest level of accuracy.** This aligns with the suggestion that AI workflow audios can optimise reaction time without sacrificing accuracy. **Instrumental music** resulted in the **slowest reaction times,** which suggests a more calming effect that slowed down participant speed, however this slower reaction time was paired with a **high level of accuracy.** This indicates that participants were more deliberate and focused under this condition.

7.3 Interpretation of Mood Findings

The mood results displayed a clear ranking among the audio conditions. **AI workflow audio produced the highest increase in Positive Affect and largest reduction in Negative Affect.** Instrumental music resulted in moderate mood improvements with a significant PA increase and notable NA decrease, while silence produced only slight mood improvements. However, this was to be expected as this silence essentially acted as a baseline for participant mood. **The only audio condition to worsen mood was the personal preference music.**

These findings actually mirrored the PLOS ONE study, which also came to the conclusion that **the most significant mood improvements were generated by the AI generated audio.** The strong emotional perks of AI audio could be explained by its favorable characteristics - **stable rhythms, low complexity, absence of lyrics and relatively low BPM** all accumulate to create a calming, immersive environment, ideal for regulating emotions and remaining concentrated.

The **deterioration in mood** after using the **personal preference music** during the task, could be explained by a sense of **emotional overstimulation or a mismatch of task and audio.** Music that is enjoyable in a more casual or leisure setting may not align with the emotional requirements needed for a cognitively demanding task.

7.4 Relationship between Mood & Performance

A key finding in this study is the exploration of the relationship between mood and performance. **Increases in Positive Affect were associated with higher accuracy, while increases in Negative Affect were linked with poorer performance.** This supports the belief in organisational psychology which proposes that **positive emotions can support cognitive ability, motivation and focus.**

This also links to the idea that **audio has an indirect influence on performance through its effect on emotions.** For example, the **AI audio produced the highest mood improvements and held the most accurate scores.** In contrast, the **personal preference was the only audio that led to declines in mood and it also produced the lowest accuracy results.** These findings highlight once again how the characteristics of the audio, ranging from tempo, to lyrics, to complexity all influence participant mood and as a result, their cognitive performance.

When studied together, these results suggest that while the audio environment itself had a direct impact on participant performance, its influence on mood played an important and possibly central part in determining these results. The study suggests that each audio creates a distinct emotional state, which influences how effectively participants could focus and answer accurately. It is in this way that **mood appears to play a key part in affecting cognitive performance** and it helps to explain why some audios enhance performance, while others impaired it.

7.5 Comparison with Existing Literature

The findings in this study are closely aligned with many reputable pieces of research within organisational psychology and music cognition. **Lyrical music** has been proven time and time again to **impair cognitive performance** during tasks which require concentration, accuracy or language processing (Ransdell & Gilroy, 2001; Salamé & Baddeley, 1989). Conversely, the impressive performance shown under the AI workflow audio and instrumental music support the idea that **low complexity, non lyrical audio can enhance focus** during such tasks (Shih et al., 2012; Kämpfe et al., 2011). The results of this study also reinforce findings that **AI generated workflow audios can improve both accuracy and mood** (Zhou et al., 2022; Orpella et al., 2025) as seen by the results that showed the AI audio produced the highest accuracy and strongest mood improvements overall. The significant correlation between mood and performance also aligns well with psychological theories that suggest positive emotional states support cognitive performance (Fredrickson, 2001).

It must be noted that **this study extends upon the existing literature by examining mood and performance simultaneously**. This addresses a gap in previous research where these two variables were often measured separately and without regard for the effect one had on another. By investigating that mood changes caused by varying audios are linked to performance results, this research **provides more context into how exactly these audio environments influence cognitive performance**.

7.6 Practical Implications

Table 19 below illustrates a **comparative ranking of the 4 audio conditions** after the study had been completed and the results were analysed. The results display distinct differences between each condition. **AI workflow audio produced the most balanced and effective outcomes** and instrumental music offered a solid alternative with slightly slower response times. Silence acted as a baseline with a moderate accuracy level and good reaction time, however, **personal preference music consistently produced the weakest results**. This table provides a summarised overview of how each audio influenced accuracy, speed and the emotional state of participants.

Table 19

Audio Ranking				
Ranking	Audio	Performance	Mood	Overall
1	AI Workflow	Highest Accuracy, Good Speed	Highest Mood Improvement	Objectively Best Choice
2	Instrumental	High Accuracy, Low Speed	Moderate Mood Improvement	Great Alternative to AI
3	Silence	Moderate Accuracy, Good Speed	Slight Mood Improvement	Good Baseline, Not Distracting
4	Personal Preference	Lowest Accuracy, Highest Speed	Significant Decline in Mood	Not Recommended

Source: Created by Author, 2026

The results of this study have notable implications for modern workplaces, especially those which require sustained attention or analytical problem solving. The findings suggest that **AI generated focus audio is likely the most effective option for optimising both cognitive performance and emotional state** during tasks requiring cognitive focus. Instrumental music is a strong alternative if AI workflow audio is not available. Silence is in no way a negative environment for focus but it is clearly less effective than the other structured audios, specifically designed or containing the characteristics to enhance focus. Finally, **personal preference music, especially containing lyrics can be detrimental**, particularly when used during tasks requiring accuracy or sustained concentration.

7.7 Limitations

While this study provided valuable insight into the correlation between audio conditions, mood and performance, there of course were a number of limitations that could be acknowledged.

Firstly, the **sample size of 25** undoubtedly limits the ability to apply these findings as generalisations. The data may have revealed clear patterns but a larger, more diverse sample would of course strengthen the arguments made in the study. Secondly, the experiment itself - a controlled environment using a **Flanker task, doesn't fully encapsulate the complexity of a real work setting** where there are often interruptions, multi-tasking and different noise levels. While there was effort made to recreate a realistic work environment, it cannot be said that the experiment was an exact replica of the participants' workplace environments.

The **personal preference audio** condition also added an **element of variability** in the experiment. Participants selected different songs with varying tempos, familiarity and lyrics. While this diversity reflects real world listening patterns, it unfortunately makes direct comparisons less accurate.

Finally, this study **measured the short term effects** of these audio conditions on workplace performance and mood. However, **longer term research would be better to determine** the

realistic effect of these audio conditions in the workplace and **whether or not these patterns and results persisted into the future.**

7.8 Recommendations

Future Research

After conducting this research, a number of recommendations can be made for both future research and practical implications in a workplace setting.

As mentioned in the limitations above, **future studies should use a larger, more diverse sample** in order to improve the strength of these findings. Including participants from a wider range of age groups, industries and cultural backgrounds would undoubtedly provide a more comprehensive understanding of the effects of the various audio conditions in the workplace. In addition to a larger sample, the study **would also benefit from examining the long term effects** of these audios. This would be helpful in determining whether the benefits of AI audio and instrumental audio continue to enhance focus and mood or if the effects change over time.

Another way to improve this study would be to **conduct the experiment in a real workplace setting.** By replicating the experiment in a real office environment, there would be a higher likelihood of factoring in the complexity of a realistic work atmosphere - including the interruptions and multi-tasking. This would help confirm if the benefits of AI workflow audio and instrumental music could survive the complexity of a real office space.

The final recommendation regarding future studies would be **carrying out an in depth analysis of task - audio suitability.** While AI workflow audio and instrumental music emerged as the most favourable options for a cognitive activity such as the Flanker task, a different result may be found if participants were to complete a task which is more repetitive or maybe collaborative. It would be interesting to see whether or not there are environments where personal preference music would provide more benefits to participants.

In the Workplace

The first recommendation to organisations after carrying out this study would be to **offer AI workflow audio as part of company initiatives** such as continuous improvement or well being activities. This would be especially relevant in companies which regularly have tasks requiring accuracy, emotional stability and strong focus. Of course, instrumental music could also be used as a suitable alternative as it also carries many similar traits such as low complexity and an absence of lyrics.

Similarly, it would be wise for these types of companies to **advise against the use of audios with a high complexity, tempo or containing lyrics,** as seen with the poor performance and mood results produced by the personal preference audio. While this type of audio may work well

as a motivator in a leisure setting, a workplace which requires intense focus may not be the ideal setting for this often overstimulating audio condition.

Overall, it is important to cater to each individuals' needs. Therefore, it is not recommended to implement strict rules or regulations on what employees should listen to in the workplace. However, it may be helpful for these businesses to **educate their staff on which audios studies have found to enhance workplace mood and performance.** Businesses could implement audio tools as part of well being strategies or general guides for employees in the business in order to get the most out of their workforce.

8. Conclusion

This study investigated how different audio environments influence workplace relevant performance and mood, and whether or not changes in mood based on varying audios affected participant performance. Clear and consistent differences were found across all 4 audio environments used. The results highlight that AI generated workflow audio produced the strongest overall benefits for both performance and emotional state. Instrumental music also improved performance, although it had a notably slower reaction time result than the AI audio. Silence acted as a more neutral baseline as it didn't have any major positive or negative effects on participants. Personal preference audio however, was found to consistently impair participant performance and worsen mood.

A key contribution to this study was identifying that audio not only has a direct impact on performance but also has an indirect influence through its effects on participant mood. Improvements in Positive Affect were associated with higher accuracy, while increases in Negative Affect often led to poorer results. This demonstrates that mood is closely linked to the outcomes found in each audio environment and extends on existing research which often treats mood and performance as separate entities instead of investigating the effect one has on the other.

These findings have valuable implications for the modern workplace. Low complexity audios with an absence of lyrics, such as AI workflow audios could act as a productive tool for enhancing concentration, accuracy and even emotional stability during tasks which are cognitively demanding. On the other hand, lyrical or high complexity music should be avoided where possible, especially during tasks requiring high levels of accuracy or strong focus.

Overall, this study contributes to a growing body of research which suggests that the music and audio environment used in the workplace is an important factor which contributes significantly to workplace performance but it is often overlooked. By investigating the various effects of these audio conditions on cognitive performance and mood, this study promotes more informed decisions by employees, organisations and researchers who are seeking to gain insights into productivity and emotional state in the workplace.

9. Bibliography

- Banbury, S. P., & Berry, D. C. (2005).** Office noise and employee concentration: Identifying causes of disruption. *Ergonomics*, *48*(1), 25–37.
- Berto, R. (2005).** Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology*, *25*(3), 249–259.
- Blood, A. J., & Zatorre, R. J. (2001).** Intensely pleasurable responses to music correlate with activity in brain regions implicated in reward and emotion. *Proceedings of the National Academy of Sciences*, *98*(20), 11818–11823.
- Braem, S., et al. (2013).** Affective modulation of cognitive control: A meta-analysis. *Cognition & Emotion*, *27*(3), 1–15.
- Campbell, J. P. (1990).** Modeling the performance prediction problem in industrial and organizational psychology. In M. Dunnette & L. Hough (Eds.), *Handbook of Industrial and Organizational Psychology* (2nd ed., pp. 687–732). Consulting Psychologists Press.
- Cassidy, G., & MacDonald, R. A. R. (2007).** The effect of background music and background noise on the task performance of introverts and extraverts. *Psychology of Music*, *35*(3), 517–537.
- Deloitte. (2024).** *Global Human Capital Trends Report 2024*.
- Dolegui, A. S. (2020).** The impact of music complexity on attention and working memory. *Psychology of Music*, *48*(6), 1–15.
- Fox, J. G., & Embrey, D. G. (1972).** Music as an aid to repetitive work. *Applied Ergonomics*, *3*(4), 193–197.
- Fredrickson, B. L. (2001).** The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226.
- Furnham, A., & Strbac, L. (2002).** Music is as distracting as noise: The differential distraction of background music and noise on cognitive test performance. *Ergonomics*, *45*(3), 203–217.
- Gómez-Rivas, J., et al. (2023).** Personal preference and emotional engagement in music-based cognitive performance. *Music & Science*, *6*(1), 1–12.
- Haake, A. B. (2011).** Individual music listening in workplace settings: An exploratory survey of offices in the UK. *Musicae Scientiae*, *15*(1), 107–129.
- Husain, G., Thompson, W. F., & Schellenberg, E. G. (2002).** Effects of musical tempo and mode on arousal, mood, and spatial abilities. *Music Perception*, *20*(2), 151–171.

- Juslin, P. N., & Västfjäll, D. (2008).** Emotional responses to music: The need to consider underlying mechanisms. *Behavioral and Brain Sciences*, *31*(5), 559–621.
- Kaplan, S. (1995).** The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, *15*(3), 169–182.
- Karageorghis, C. I., & Priest, D.-L. (2012).** Music in the exercise domain: A review and synthesis. *International Review of Sport and Exercise Psychology*, *5*(1), 44–66.
- Kämpfe, J., Sedlmeier, P., & Renkewitz, F. (2011).** The impact of background music on adult listeners: A meta-analysis. *Psychology of Music*, *39*(4), 424–448.
- Keeler, J., et al. (2025).** Music-based interventions in modern workplaces: A systematic review. *Journal of Occupational Health Psychology*, *30*(1), 1–15.
- Kim, J., & de Dear, R. (2013).** Workspace satisfaction: The privacy-communication trade-off in open-plan offices. *Journal of Environmental Psychology*, *36*, 18–26.
- Koelsch, S. (2014).** Brain correlates of music-evoked emotions. *Nature Reviews Neuroscience*, *15*(3), 170–180.
- Kostagiolas, P., Lavranos, C., & Korfiatis, N. (2023).** Cognitive load and background music complexity: A systematic review. *Cognitive Processing*, *24*(1), 45–60.
- Kühnis, J., & Elmer, S. (2021).** Music preference and cognitive flexibility: The role of emotional engagement. *Psychology of Aesthetics, Creativity, and the Arts*, *15*(4), 632–642.
- Lavie, N. (1995).** Perceptual load as a necessary condition for selective attention. *Journal of Experimental Psychology: Human Perception and Performance*, *21*(3), 451–468.
- Lesiuk, T. (2005).** The effect of music listening on work performance. *Psychology of Music*, *33*(2), 173–191.
- Mark, G., Gudith, D., & Klocke, U. (2008).** The cost of interrupted work: More speed and stress. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 107–110). ACM.
- North, A. C., & Hargreaves, D. J. (1999).** Music and driving game performance. *Scandinavian Journal of Psychology*, *40*(4), 285–292.
- Orpella, J., Bowling, D. L., Tomaino, C., & Ripollés, P. (2025).** Effects of music advertised to support focus on mood and processing speed. *PLOS ONE*, *20*(2), e0316047.

Perham, N., & Currie, H. (2019). Does listening to music impair studying? *Applied Cognitive Psychology*, 33(1), 24–31.

Rosen, L. D., Lim, A., Carrier, L. M., & Cheever, N. A. (2011). An empirical examination of the educational impact of text message interruptions during college lectures. *Computers in Human Behavior*, 35, 116–123.

Salamé, P., & Baddeley, A. (1989). Effects of background music on phonological short-term memory. *Quarterly Journal of Experimental Psychology*, 41(1), 107–122.

Sarason, I. G. (1996). *Cognitive interference: Theories and findings*. Psychology Press.

Shih, Y.-N., Huang, R.-H., & Chiang, H.-Y. (2012). Background music: Effects on attention performance. *Work*, 42(4), 573–578.

Sternin, A., et al. (2021). Familiarity and cognitive effort in music perception. *Neuropsychologia*, 158, 107868.

Teigen, K. H. (1994). Yerkes–Dodson: A law for all seasons. *Theory & Psychology*, 4(4), 525–547.

Westermann, A., & Riedel, J. (2020). Adaptive audio environments for cognitive performance: A review. *Human Factors*, 62(7), 1123–1138.

Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18(5), 459–482.

Yirka, B. (2025). ‘Work flow’ music designed to improve performance does just that. *Phys.org*. <https://phys.org/news/2025-02-music.html>

Zhou, X., et al. (2022). AI-generated ambient sound improves accuracy on complex problem-solving tasks. *Cognitive Research: Principles and Implications*, 7(1), 1–12.

10. Appendices

10.1 Flanker Test Results

Details		Performance							
Participant		Task Accuracy				Average Reaction Time (In Seconds)			
Number	M/F	AI	Instrumental	Personal Choice	Silence	AI	Instrumental	Personal Choice	Silence
P1	M	94%	100%	75%	88%	0.35	0.35	0.25	0.3
P2	M	100%	94%	63%	75%	0.6	0.55	0.45	0.5
P3	M	88%	50%	31%	75%	0.45	0.4	0.25	0.4
P4	M	94%	63%	50%	81%	0.55	0.6	0.9	0.5
P5	M	88%	63%	38%	75%	0.4	0.45	0.3	0.4
P6	M	75%	100%	63%	75%	0.45	0.5	0.8	0.4
P7	M	100%	100%	44%	63%	0.6	0.7	1.3	0.65
P8	M	88%	88%	56%	94%	0.5	0.55	0.4	0.5
P9	M	100%	88%	75%	88%	0.35	0.45	0.55	0.4
P10	M	81%	63%	31%	44%	0.4	0.45	0.25	0.5
P11	M	100%	94%	75%	81%	0.45	0.5	0.85	0.6
P12	M	81%	88%	75%	100%	0.45	0.5	0.35	0.55
P13	F	94%	81%	50%	63%	0.5	0.55	0.2	0.4
P14	F	94%	88%	63%	81%	0.4	0.5	0.3	0.45
P15	F	94%	69%	44%	81%	0.55	0.5	0.35	0.55
P16	F	100%	94%	63%	81%	0.55	0.55	0.4	0.6
P17	F	100%	88%	69%	75%	0.55	0.5	0.35	0.45
P18	F	81%	75%	50%	88%	0.45	0.5	0.2	0.4
P19	F	63%	56%	38%	75%	0.55	0.6	0.3	0.5
P20	F	88%	75%	56%	69%	0.5	0.45	0.35	0.55
P21	F	100%	94%	69%	88%	0.5	0.55	0.25	0.4
P22	F	88%	94%	63%	81%	0.65	0.55	0.35	0.5
P23	F	100%	81%	56%	69%	0.45	0.5	0.35	0.55
P24	F	81%	75%	44%	81%	0.55	0.5	0.25	0.5
P25	F	94%	81%	50%	88%	0.55	0.6	0.3	0.55
Average		91%	82%	56%	78%	0.48	0.51	0.38	0.48

Source: Created by Author, 2026

10.2 Panas Mood Results

PANAS Mood Test Results																
Audio	AI Generated				Instrumental				Personal Preference				Silence			
PA/NA	Positive Affect		Negative Affect		Positive Affect		Negative Affect		Positive Affect		Negative Affect		Positive Affect		Negative Affect	
Before/After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
P1	28	34	16	12	27	30	17	14	30	28	18	21	26	27	15	13
P2	30	36	18	13	29	33	17	15	32	29	20	21	27	29	16	15
P3	26	31	20	15	25	29	19	17	28	26	21	23	24	25	18	18
P4	27	33	17	13	26	30	18	15	29	27	20	24	25	25	17	16
P5	29	35	16	12	28	31	17	14	31	29	18	21	26	27	16	13
P6	25	30	19	14	24	28	20	17	27	25	22	25	23	25	18	17
P7	31	37	15	11	30	31	16	13	33	30	18	20	28	29	15	14
P8	28	34	17	13	27	30	18	15	30	27	20	22	26	27	17	16
P9	32	38	14	10	31	31	15	12	34	31	17	22	29	28	14	12
P10	24	29	21	16	23	25	20	18	26	24	23	25	22	23	19	16
P11	30	36	17	12	29	30	18	15	32	29	19	22	27	29	17	16
P12	27	33	18	14	26	30	19	16	29	27	21	23	25	25	18	17
P13	26	32	19	14	25	29	20	17	28	26	22	24	24	25	18	17
P14	29	35	16	12	28	32	17	14	31	29	19	21	26	27	16	15
P15	28	34	17	13	27	31	18	15	30	28	20	23	25	26	17	14
P16	31	37	15	11	30	30	16	13	33	30	18	20	28	26	15	13
P17	30	36	16	12	29	31	17	14	32	29	19	21	27	28	16	15
P18	25	30	20	15	24	28	19	17	27	25	22	24	23	24	18	17
P19	23	28	22	17	22	27	21	19	25	22	20	26	21	24	20	17
P20	27	33	18	14	26	30	19	16	29	27	21	23	25	26	18	17
P21	30	36	17	12	29	33	18	15	32	29	20	22	27	28	17	16
P22	28	34	17	13	27	31	18	15	30	28	20	22	26	27	17	16
P23	31	37	15	11	30	34	16	13	33	30	18	20	28	29	15	14
P24	26	32	19	14	25	29	20	17	28	26	22	24	24	25	18	17
P25	29	35	16	12	28	32	17	14	31	29	19	21	26	27	16	15
Average	28	33,8	17,4	13	27	30,2	18	15,2	30	27,6	19,88	22,4	25,52	26,44	16,84	15,44

Source: Created by Author, 2026

10.3 Qualitative Responses

Perceived Focus under Each Audio Type

Perceived Focus				
Focused/Neutral/Distracted				
	AI	Instrumental	Personal Preference	Silence
P1	Focused	Focused	Distracted	Neutral
P2	Focused	Focused	Distracted	Neutral
P3	Focused	Neutral	Distracted	Neutral
P4	Neutral	Neutral	Neutral	Focused
P5	Focused	Focused	Neutral	Neutral
P6	Neutral	Focused	Distracted	Neutral
P7	Neutral	Focused	Distracted	Focused
P8	Focused	Neutral	Neutral	Neutral
P9	Focused	Neutral	Distracted	Focused
P10	Focused	Focused	Distracted	Focused
P11	Neutral	Focused	Distracted	Neutral
P12	Focused	Focused	Neutral	Neutral
P13	Focused	Focused	Distracted	Neutral
P14	Focused	Neutral	Distracted	Neutral
P15	Neutral	Neutral	Distracted	Neutral
P16	Neutral	Neutral	Neutral	Focused
P17	Focused	Focused	Neutral	Neutral
P18	Focused	Focused	Distracted	Neutral
P19	Focused	Neutral	Distracted	Focused
P20	Focused	Focused	Distracted	Neutral
P21	Focused	Focused	Neutral	Neutral
P22	Neutral	Neutral	Distracted	Neutral
P23	Focused	Neutral	Distracted	Focused
P24	Focused	Focused	Neutral	Neutral
P25	Focused	Neutral	Distracted	Neutral

Source: Created by Author, 2026

Audio Preference Before Task

Audio Preference Before Task				
	AI	Instrumental	Personal Preference	Silence
P1			X	
P2		X		
P3			X	
P4			X	
P5			X	
P6		X		
P7		X		
P8				X
P9			X	
P10			X	
P11	X			
P12		X		
P13			X	
P14				X
P15		X		
P16			X	
P17				X
P18				X
P19			X	
P20		X		
P21		X		
P22			X	
P23				X
P24	X			
P25		X		
Total	2	8	10	5

Source: Created by Author, 2026

Audio Preference After Task

Audio Preference After Task				
	AI	Instrumental	Personal Preference	Silence
P1	X			
P2		X		
P3	X			
P4		X		
P5	X			
P6	X			
P7		X		
P8	X			
P9				X
P10		X		
P11	X			
P12	X			
P13		X		
P14	X			
P15		X		
P16	X			
P17		X		
P18	X			
P19		X		
P20	X			
P21				X
P22				X
P23	X			
P24	X			
P25		X		
Total	13	9	0	3

Source: Created by Author, 2026

11. AI Declaration

Declaración de Uso de Herramientas de Inteligencia Artificial Generativa en Trabajos Fin de Grado

ADVERTENCIA: Desde la Universidad consideramos que ChatGPT u otras herramientas similares son herramientas muy útiles en la vida académica, aunque su uso queda siempre bajo la responsabilidad del alumno, puesto que las respuestas que proporciona pueden no ser veraces. En este sentido, NO está permitido su uso en la elaboración del Trabajo fin de Grado para generar código porque estas herramientas no son fiables en esa tarea. Aunque el código funcione, no hay garantías de que metodológicamente sea correcto, y es altamente probable que no lo sea.

Por la presente, yo, Clodagh Ryan, estudiante de E4 ADE de la Universidad Pontificia Comillas al presentar mi Trabajo Fin de Grado titulado "Crazy for Music! Music and Mental Health", declaro que he utilizado la herramienta de Inteligencia Artificial Generativa ChatGPT u otras similares de IAG de código sólo en el contexto de las actividades descritas a continuación:

1. **Brainstorming de ideas de investigación:** Utilizado para idear y esbozar posibles áreas de investigación.
2. **Crítico:** Para encontrar contra-argumentos a una tesis específica que pretendo defender.
3. **Referencias:** Usado conjuntamente con otras herramientas, como Science, para identificar referencias preliminares que luego he contrastado y validado.
4. **Metodólogo:** Para descubrir métodos aplicables a problemas específicos de investigación.
5. **Interpretador de código:** Para realizar análisis de datos preliminares.
6. **Estudios multidisciplinares:** Para comprender perspectivas de otras comunidades sobre temas de naturaleza multidisciplinar.
7. **Constructor de plantillas:** Para diseñar formatos específicos para secciones del trabajo.
8. **Corrector de estilo literario y de lenguaje:** Para mejorar la calidad lingüística y estilística del texto.
9. **Generador previo de diagramas de flujo y contenido:** Para esbozar diagramas iniciales.
10. **Sintetizador y divulgador de libros complicados:** Para resumir y comprender literatura compleja.
11. **Revisor:** Para recibir sugerencias sobre cómo mejorar y perfeccionar el trabajo con diferentes niveles de exigencia.
12. **Generador de encuestas:** Para diseñar cuestionarios preliminares.
13. **Traductor:** Para traducir textos de un lenguaje a otro.

Afirmo que toda la información y contenido presentados en este trabajo son producto de mi investigación y esfuerzo individual, excepto donde se ha indicado lo contrario y se han dado los créditos correspondientes (he incluido las referencias adecuadas en el TFG y he explicitado para que se ha usado ChatGPT u otras herramientas similares). Soy consciente de las implicaciones

académicas y éticas de presentar un trabajo no original y acepto las consecuencias de cualquier violación a esta declaración.

Fecha: 27/05/2026

Firma:

A handwritten signature consisting of the letters 'C' and 'R' in a cursive, fluid style. The 'C' is a simple loop, and the 'R' has a vertical stem and a curved top that extends to the right.