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From Stress to Success: The Power of Music in Learning Environments for Children with ADHD

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Abstract

This qualitative study explores students' perceptions regarding the role of music in their learning processes and daily activities. It aims to assess the music preferences of fifth- and sixth-grade students, aged 11–12, in regular elementary school classrooms, both with and without ADHD, and their perceptions of the impact of preferred and non-preferred music on their academic performance in tests. Some of the participants were diagnosed with ADHD, while others were not. Data were collected through semi-structured interviews designed explicitly for this study. The key interview questions focused on students' affinity for music, their music-listening habits throughout the day, their preferred music genres, and whether listening to music helps them complete school assignments. The findings highlight the relationship between preferred music genres and the conditions under which music supports or hinders learning. Additionally, the study identified differences between students with varying attention and concentration profiles. The results suggest the potential for integrating personalized musical interventions to support students' learning and daily functioning.

Keywords: music therapy; background music; ADHD.

Introduction

Listening to music is well known for its emotional and cognitive effects. It is often used to reduce stress, enhance mood, and improve concentration. Background music plays a complex role in the classroom- it can soothe or distract, depending on the individual and the context. For students with ADHD, who often

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face challenges in maintaining focus, music may offer unique benefits (Batt-Rawden & DeNora, 2005).

Background music refers to music played while listeners are focused on a task or activity whose essence is not directly or indirectly related to the music itself. A study examining the effect of background music on performance tasks showed improvements in participants' long-term memory, intelligence test results, and tests assessing information processing speed and efficiency in solving verbal tasks. Listening to music is an effective tool for enhancing concentration and focus, awakening students to the importance of attending to auditory stimuli, and maintaining high levels of motivation, interest, and engagement in lesson content (Portowitz *et al.*, 2009).

Mood management is the most important function of music listening. Many adolescents consciously listen to music to regulate or improve their emotional state, or get into a mood that suits the occasion or situation. They tend to listen to music that is emotionally congruent with their current emotional states to amplify or change that state (McFerran, Garrido, O'Grady, Grocke, & Sawyer, 2014; Thoma *et al.*, 2012). Music has been shown to promote happiness, but a far broader range of effects is instigated through music listening (Randall, Rickard, & VellaBrodrick, 2014). Listeners may also experience various emotions, including excitement, wakefulness, energy, calmness, melancholy, or nostalgia (Lonsdale & North, 2011; Saarikallio & Erkkilä, 2007). Van Goethem and Sloboda (2011) found that affective regulation through music listening integrates with more general mood regulation strategies (Van Goethem & Sloboda, 2011). For instance, listening to music can alleviate loss, sadness, and loneliness and help one calm down and relax (Avery, 1979; Kurdek, 1987; Shifriss, Bodner, & Palgi, 2014). Furthermore, adolescents often listen to their favorite music as a means of emotional regulation, particularly when experiencing anger or seeking to express and process complex emotions (Labbé, Schmidt, Babin, & Pharr, 2007; Sharman & Dingle, 2015). Miranda, Gaudreau, and Morisot (2010) claim that music can even help to cope with longer-lasting mood disturbances, such as depression (Miranda, Gaudreau, & Morisot, 2010). Therefore, music listening is relevant, particularly for adolescents and young adults facing internalizing and externalizing problems (Ter Bogt *et al.*, 2010). Most people know and value music's mood-enhancing qualities, so they prefer self-identified "happy" music. Paradoxically, many people also listen to self-identified "sad" music and claim that this is satisfying (Chen, Zhou, & Bryant, 2007; Hunter, Schellenberg, & Griffith, 2011; Saarikallio, 2011). Van den Tol and Edwards (2011) suggest that listening to sad music may evoke feelings of connectedness to loved ones and serve as a form of emotional support, akin to having an imaginary friend. (Van den Tol & Edwards,2011). Hence, happy music and sad music are important for alleviating mood and coming to terms with adverse, distressing events. Although music may be of utmost importance, particularly during adolescence, (emerging) adults also turn to music for its mood-enhancing and coping qualities (Saarikallio, 2011). Ter Bogt *et al.* (2010)

concluded that music for mood regulation and coping is a widely used strategy that does not differentiate significantly between broad demographic categories, including gender, age, and educational level.

Bottiroli (2014) found that background music positively affected task performance and mood, regardless of tempo (Bottiroli, 2014). Although most studies have found a positive effect of background music on cognitive tasks, Rastogi and Silver (2014) have indicated a negative association between the duration of listening to music and test success.

Therefore, it remains unclear which style of background music contributes more significantly and whether each style positively impacts performance quality in various tasks.

The gap in knowledge

While previous studies have examined the cognitive effects of music, few have qualitatively explored students' experiences with music in the classroom. This study aims to bridge the gap by investigating the perceptions of students with and without ADHD regarding using music in the classroom.

This study aimed to explore how students perceive the role of music in their daily lives and under what conditions they experience music as either a facilitator or a distraction to concentration. Additionally, the study examined whether listening to preferred music could influence academic task performance and whether differences in perceptions exist between students diagnosed with ADHD and those without.

Methodology

This study employed a qualitative case study approach. Data were analyzed using content analysis techniques, which involved conceptualizing, identifying categories that accurately represent the concepts, and organizing the data accordingly (Yildirim & Simsek, 2013).

Participants

The study included 16 elementary school students (aged 11–12), half of whom were diagnosed with ADHD, while the other half had no such diagnosis. All participants were enrolled in regular elementary school classrooms. The sampling method used was *convenience sampling*, in which participants were selected based on their accessibility and availability to the researcher. This sampling approach facilitates efficient and timely data collection (Henry, 1990).

Table 1. Characteristics of subjects

No	Age	Gender	ADHD
S1	11	Female	_
S2	12	Female	_
S3	12	Female	+
S4	12	Female	+
S5	11	Female	+
S6	11	Female	-
S7	11	Female	-
S8	12	Male	-
S9	11	Male	+
S10	11	Male	+
S11	12	Male	_
S12	11	Male	+
S13	12	Male	+
S14	12	Male	+
S15	12	Male	-
S16	11	Male	-

Note: All participants' parents signed an informed consent form, ensuring the privacy and confidentiality of their children's information.

Data Collection

This study collected data through *open-ended interviews* (Yildirim & Simsek, 2013, p. 148). Open-ended questions were used to explore how often students listen to music, their reasons for listening, and the types of music they engage with throughout the day. To uncover children's affinity for music and its impact, participants were asked: (1) Whether they listen to music daily and, if so, at what times; (2) Their musical preferences; (3) Whether they tend to complete daily tasks with background music; (4) Would listening to their preferred music help them concentrate in class and complete academic tasks more effectively?

Following the coding of responses, *categories* were developed. *Categorization* involves classifying concepts derived from content analysis (Yildirim & Simsek, 2013, p. 260). The categories in this study included: (1) Music as a Stress Reduction Tool; (2) The Impact of Music on Concentration; (3) The Effect of Music Listening Across Different Academic Disciplines

The interviews were conducted *individually* with each participant. Each student provided verbal responses, which were recorded and documented in real time during the interview sessions.

Results

The data obtained from the interviews were analyzed using *content analysis*. Words, concepts, expressions, and sentences were grouped into three main themes that represent the complex processes involved in children's perceptions of the role of music in their learning and daily activities.

Each theme encompassed several *categories* that reflected its essence based on the context of the interviews and the overall understanding of the subject.

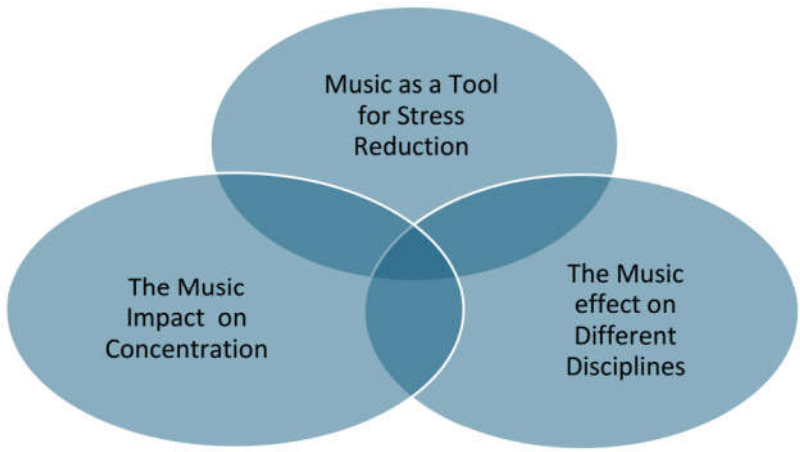

Figure 1. Three emerging themes

Theme 1. Music as a Tool for Stress Reduction

Students were asked whether they listen to music when they do so and how it benefits them. Their responses revealed recurring categories, including (1) Relaxing and (2) Mood Improvement.

***Music as a relaxant*:** Many students described music as a source of comfort during stressful moments, such as test anxiety, school assignments, or daily activities that require focus. Their accounts suggest that listening to instrumental or calming music helps reduce stress and creates a more relaxed work environment: *"When I am stressed about a test, I listen to quiet music, and it makes me feel better" (S2, boy with ADHD, 12 years old*). For instance, some students reported listening to quiet, soothing music while doing homework, which helped them feel

more at ease and improved their ability to concentrate. One student emphasized that listening to pleasant music alleviates feelings of stress and overload, making it easier to focus on tasks. Other students reported that music helps distract them from overwhelming thoughts, temporarily relieving stress: *"It helps me not think about anything" (S13, boy with ADHD, 12 years old*).

***Music as a Mood Improver*:** Beyond stress reduction, several participants noted that music improves their mood and puts them in a more positive mental state. Some students mentioned that they enjoy listening to their favorite songs while engaging in daily activities such as cleaning, playing games, or unwinding after a long school day: "When I clean the house, I play background music on the smart TV, and it makes it fun for me" (S5, girl with ADHD, 11 years old). One student shared that playing background music while cleaning makes the task more enjoyable and engaging. This example demonstrates how music can transform mundane activities into enjoyable experiences, reducing fatigue and boosting motivation. When I tidy up the room, I put music in the background, which makes it more enjoyable (S7, girl without ADHD, 11 years old). One participant stated that listening to music allows him to clear his mind, reduce anxiety, and promote relaxation:" When I listen to music, I relax" (S12, boy with ADHD, 11 years old). For these students, music served as a temporary escape from stressful situations, offering mental relief.

Theme 2: The Impact of Music on Concentration

Students had divergent views regarding the effect of music on their concentration. Many students with ADHD reported that soft, instrumental music helped them focus, whereas others stated that music distracted them and made it harder to comprehend tasks.

Music as a Focus-Enhancing Tool: The interesting findings derived from the interviews were that many students, particularly those with ADHD, noted that soft, instrumental music helped them stay focused, especially during activities that required sustained attention. They described music as blocking distractions from their surroundings, creating a structured auditory environment, and facilitating better concentration. For example, one student shared that listening to background music with headphones while playing on the computer helped maintain focus*: "When I play on the computer, I listen to background music with headphones, and it helps me stay focused" (S3, girl with ADHD, 12 years old).* Another student reported that listening to quiet, non-rhythmic music at home enabled him to concentrate on academic tasks: "I listen to quiet, non-rhythmic music while studying at home" (S8, boy with ADHD, 12 years old). These accounts suggest that music can serve as an external regulator, allowing students to manage their attention more effectively by minimizing environmental distractions.

Music enhances concentration on academic tasks: Some students indicated that music played a significant role in specific academic contexts. For instance,

several participants mentioned that instrumental or calming music provided a sense of rhythm that facilitated engagement in subjects requiring creativity or memorization. However, others expressed that music was helpful in some tasks but less effective in others. One student explained that music assisted with writing assignments, stimulating ideas, and maintaining engagement with the task. However, when it came to subjects such as mathematics, they preferred complete silence to ensure deep cognitive processing. This distinction suggests that the impact of music is task-dependent, meaning that its effectiveness varies based on the cognitive demands of the activity: *"It helps me concentrate" (S1, girl without ADHD, 11 years old*).

Music as a Source of Distraction: Conversely, some students found music to be a disruptive factor rather than a facilitator of concentration. A common concern was that songs with lyrics diverted their attention from the task. One student described how, when listening to music with lyrics, they would unconsciously start singing along and lose track of what they were doing: *"If there are lyrics in the song, I start singing and forget what I am doing" (S9, boy with ADHD, 11 years old*). This observation aligns with previous research suggesting that lyrical music competes for cognitive resources, making processing complex or language-based information more challenging. Silence or ambient background noise was preferable for these students, allowing them to maintain focus without the additional cognitive load of processing lyrics (Rastogi & Silver,2014).

Theme 3: Music Affects Different Disciplines Differently

Students were asked if they listened to music while performing an academic task and if they thought it could help them. Two categories emerged from their responses: (1) Music's Effect on STEM Subjects; (2) Music's Effect on Humanities Subjects.

The effectiveness of music varies depending on the **task's difficulty** and the **type of music**. Students found music **more beneficial for creative tasks, such as writing, and less effective for analytical tasks, such as mathematics**. No significant differences were seen between students with ADHD and students without this diagnosis.

The Varying Impact of Music across Different Disciplines: The influence of music on concentration and performance appears to differ depending on the academic subject. Students' responses suggest that the effectiveness of music is task-dependent, with music being more beneficial for creative disciplines and less effective for analytical or logic-based tasks. This distinction aligns with cognitive research, indicating that different brain processes are engaged when working on STEM subjects versus humanities-related tasks (Juslin & Laukka, 2004).

Music's Effect on STEM Subjects: Students preferred silence over background music for subjects requiring logical reasoning, problem-solving, and numerical accuracy, such as mathematics and science. Several students reported that music, particularly with lyrics, interfered with their ability to process equations and solve problems efficiently. One student stated, *"There is no way I would listen to music while solving math problems" (S6, girl without ADHD, 11 years old*). This sentiment suggests that tasks involving logical sequencing and precise calculations require uninterrupted focus, where external auditory stimuli may interfere with working memory and cognitive processing. The preference for a quiet environment in STEM-related tasks aligns with previous studies, which indicate that music, whether incredibly lyrical or fast-paced, can create cognitive overload, making it more challenging to retain and manipulate numerical information (Bottiroli *et al.*, 2014). The need for increased concentration in problem-solving tasks suggests that music may be counterproductive in subjects requiring high levels of accuracy and sequential reasoning.

Music's Effect on Humanities Subjects: In contrast, students generally reported that music positively impacts creative and language-based disciplines, such as literature and writing. One student noted, *"When writing stories, music helps me think, but in math, I need silence" (S15, girl without ADHD, 12 years old*). This response reflects a broader trend: Students found that listening to music, mainly instrumental or familiar melodies, helped stimulate creativity, enhance engagement, and sustain focus over extended writing periods. One possible explanation for this phenomenon is that humanities subjects, especially those involving writing or storytelling, rely more on divergent thinking, allowing multiple solutions and interpretations. Music may serve as a cognitive facilitator, helping to generate new ideas and maintain a steady flow of thought. Furthermore, students may find background music emotionally engaging, contributing to a more immersive and enjoyable writing experience (Portowitz *et al.*, 2009). Additionally, since writing tasks often require sustained engagement over long periods, music may help alleviate mental fatigue and maintain motivation. Unlike STEM subjects, where precision and sequential thinking are essential, creative disciplines may benefit from background music's mood-enhancing and stress-reducing effects. The difficulty of a task also plays a crucial role in determining whether music is beneficial or distracting. Students generally found music helpful for familiar or less cognitively demanding tasks, while silence was preferred when working on complex or unfamiliar problems. Additionally, the type of music made a difference - instrumental and calming music was more widely accepted, while fast-paced or lyrical music was perceived as distracting in most cases.

Conclusion

This study highlights the complex role of music in the classroom environment. The findings indicate that while listening to music can reduce stress and enhance students' concentration, its effectiveness depends on individual preferences and the context in which it is incorporated into the learning process.

The results align with previous research and suggest that instrumental music is less distracting than music with lyrics. However, emphasizing individual differences and the relationship between task types and music selection provides new insights. These findings suggest that educators may consider integrating personalized music options, particularly for students with ADHD, to enhance the learning environment. Accordingly, guidelines could be developed for using instrumental or calming music during specific tasks to support students' cognitive and emotional needs.

The findings also reinforce the well-established role of music in the daily lives of young adults. These data are consistent with the study by Lamont *et al.* (2003), which reveals that 89% of students listen to music for two to nine hours per day, or approximately 13 hours per week, and prioritize music over other daily activities.

Given this, educators should acknowledge students' listening habits and musical genres. Such awareness can be a valuable tool for supporting students in academic tasks and helping them use music to reduce stress and relax within the school environment.

Furthermore, the findings confirm that music has the potential to be an effective tool for reducing stress and enhancing mood. Music helps students relax, shift their focus from stressful thoughts, and enhance their overall well-being. However, the effects of music are highly individualized, varying according to students' preferences and specific learning contexts.

Finally, this study underscores that the influence of music on concentration is highly individualized and context-dependent. While some students benefit from background music to enhance focus, others perceive it as a distraction that hinders task completion. Additionally, the type of music plays a crucial role—instrumental or soft background music appears more conducive to concentration, whereas lyrical or highly rhythmic music tends to be more disruptive.

These findings highlight the importance of a personalized approach to integrating music into educational settings, considering students' diverse needs and the varying characteristics of different academic tasks. Thoughtful integration of music into the classroom may enhance the learning experience, reduce stress, and improve students' ability to concentrate in ways that align with their individual preferences and cognitive styles.

The findings of this study contribute to the growing understanding of the role of music in educational settings by highlighting the importance of tailoring auditory environments to individual preferences and task requirements. Allowing students

to regulate their auditory surroundings based on their specific needs may be an effective strategy for enhancing learning outcomes. Educators might consider adopting flexible approaches, such as permitting students to use headphones for instrumental music during independent work while maintaining silent periods for tasks that require intense cognitive engagement. Furthermore, the study underscores that the impact of music on learning is discipline-specific and task-dependent. While music can foster creativity and engagement in humanities subjects, it may impede concentration in STEM-related disciplines that demand structured and precise thinking. Given these variations, educators could implement adaptable classroom policies that empower students to self-regulate their auditory environments. For instance, background music might be encouraged during creative writing exercises, whereas a quieter setting could be maintained for tasks that involve problem-solving and logical reasoning. By acknowledging these distinctions, teachers can support students in optimizing their learning experiences, ensuring that music is a cognitive facilitator rather than a distraction. Integrating personalized auditory strategies within the classroom may enhance student focus, engagement, and overall academic performance.

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