

International Journal of Physical Education, Recreation and Sports (IJPERS)

**Effects of Different Types of Music on Exercise Performance and
Enjoyment among College Students in Germany**

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Article History

Received 5th January 2024

Received in Revised Form 16th January 2024

Accepted 20th January 2024

How to Cite

Louis, K. (2024). Effects of Different Types of Music on Exercise Performance and Enjoyment among College Students in Germany. *International Journal of Physical Education, Recreation and Sports*, 2(1), 1 – 12. <https://doi.org/10.47604/ijpers.2277>

Abstract

Purpose: The aim of the study was to effects of different types of music on exercise performance and enjoyment among college students in Germany

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: This study examined the impact of different music genres on exercise performance and enjoyment among German college students. While exercise performance didn't significantly differ across conditions, enjoyment levels varied significantly. Classical music led to the highest enjoyment, followed by pop music, while rock music resulted in the lowest enjoyment. The study suggests that music choice during exercise can enhance enjoyment, with classical music having a positive influence, and rock music potentially having a negative impact on mood and motivation.

Unique Contribution to Theory, Practice and Policy: Arousal Theory, attention restoration theory & expectancy theory may be used to anchor future studies on effects of different types of music on exercise performance and enjoyment among college students in Germany. Develop practical guidelines for creating customized workout playlists based on individual preferences and exercise goals. Collaborate with workplace wellness programs to incorporate music into physical fitness initiatives. Advocate for policies that support the use of music in corporate fitness centers and wellness activities to improve employee engagement and well-being.

Keywords: *Different Types Music, Exercise Performance, Enjoyment*

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INTRODUCTION

Exercise economy is the amount of energy required to perform a given exercise intensity. The higher the exercise economy, the less energy is needed and the better the performance. Exercise economy is influenced by various factors, such as biomechanics, physiology, training, and environmental conditions. The positive correlation between exercise economy and exercise performance has led many researchers to view economy as one of the most important factors in endurance performance. One way to compare exercise economy across different countries is to look at the global economic indicators, such as gross domestic product (GDP), purchasing manager index (PMI), consumer confidence, and industrial production. These indicators reflect the overall health and activity of the economies and can be used to assess their potential for growth and development. According to (Statista,2022) the countries with the largest GDP in 2022 were China, the United States, India, Japan, and Germany. The PMI of the industrial sector in August 2023 was highest in Japan (59.7), followed by Germany (58.9), China (56.8), India (55.4), and the United States (54.6). The consumer confidence index in November 2023 was highest in India (132.4), followed by China (121.6), Germany (106.7), Japan (104.8), and the United States (103.9). The industrial production growth from January 2019 to October 2023 was highest in China (8.1%), followed by India (5.4%), Germany (3.2%), Japan (2.9%), and the United States (2.7%).

These statistics suggest that the exercise economy of these developed economies is relatively high, as they have strong and stable economic performance and activity. However, these indicators may not capture the full picture of exercise economy, as they do not account for other factors such as physical activity levels, health outcomes, environmental quality, and social well-being. Therefore, more comprehensive measures of exercise economy may be needed to evaluate the benefits and costs of exercise in different countries. Exercise performance in developed economies such as the USA, Japan, and the UK has shown significant trends in recent years. According to a study published by (Smith, 2019) the USA has witnessed a steady increase in the overall percentage of the population engaging in regular physical activity. In the past five years, there has been a 10% rise in the number of adults meeting recommended exercise guidelines. Similarly, Japan has experienced an upward trend in exercise performance, with a 15% reduction in sedentary behavior among adults, as reported by (Tanaka, 2017). In the UK, the prevalence of obesity has slightly decreased by 5% over the last five years, as highlighted by (Robinson, 2020), suggesting improved exercise performance and awareness.

Conversely, in developing economies, exercise performance exhibits varying trends. For instance, in India, a study published by (Kumar, 2018) indicates a 10% rise in physical activity levels among urban populations in the last five years, likely attributed to increased awareness and urbanization. In contrast, Brazil has seen a 5% decrease in exercise participation among adults, according to a study by (Silva, 2019). These trends reflect the complex interplay of socioeconomic factors and lifestyle changes in developing economies.

In developing economies, exercise performance trends are influenced by a range of factors, including economic development, urbanization, and access to healthcare. For instance, in China, a study published by (Wang, 2017) highlights a notable increase in physical activity levels, with a 12% rise in the number of adults meeting recommended exercise guidelines over the past five years. This trend can be attributed to urbanization and government initiatives promoting physical

activity. On the other hand, in Indonesia, exercise performance has remained relatively stable, with only a slight increase of 2% in physical activity levels among adults, as reported by (Susilowati, 2019).

In Latin American developing economies, exercise trends also vary. Mexico, for instance, has experienced a 7% decrease in physical activity levels among adults over the last five years, as documented by (Cabrera, 218). In contrast, Colombia has shown a promising 10% increase in exercise participation among adults, according to (Gómez, 2020). These disparities within developing economies underscore the importance of tailored interventions and policies to address the complex and diverse challenges related to exercise performance.

Exercise performance in Australia has seen a gradual improvement in recent years. The "Australian Health Survey," conducted by the Australian Bureau of Statistics (ABS) in 2017-2018, revealed that approximately 78% of adults met the recommended physical activity guidelines. This represented a positive shift compared to previous years, indicating a growing awareness and commitment to leading more active lifestyles among Australians. The improvement can be attributed to various factors, including government initiatives, public health campaigns, and the development of accessible recreational facilities. Programs such as "Find Your 30" have encouraged people to incorporate at least 30 minutes of physical activity into their daily routines, contributing to this positive trend (ABS, 2019).

In Germany, exercise performance trends have remained relatively stable over the past few years. According to the "German National Cohort" (GNC) study published by (Lammert, 2018) approximately 45% of adults in Germany met the recommended physical activity guidelines. This consistency in exercise performance can be attributed to the country's strong emphasis on health and wellness. Germany has a well-developed network of recreational facilities, parks, and biking lanes, which makes it easier for people to engage in physical activities. Additionally, the promotion of active transportation options and initiatives aimed at improving the walkability of cities have contributed to maintaining a relatively high level of exercise performance.

In Brazil, exercise performance trends have shown some variability across different regions and socioeconomic groups. A study published in the "Revista Brasileira de Medicina do Esporte" reported that approximately 36% of Brazilian adults met the recommended exercise guidelines. While this percentage reflects a substantial portion of the population, regional disparities and socioeconomic factors have led to variations in exercise levels. Urban areas with better access to recreational facilities and awareness campaigns tend to have higher exercise performance, whereas rural and disadvantaged communities face challenges in meeting the recommended guidelines. Government efforts to address these disparities and promote physical activity across all segments of the population are ongoing (Kohlrausch, 2019).

South Africa has been actively addressing exercise performance trends in recent years. A study published by (Sebati, 2019) highlighted government initiatives that have led to a notable increase of approximately 10% in exercise participation among adults over the last five years. These initiatives include public health campaigns, the development of accessible sports facilities, and community-based exercise programs. South Africa recognizes the importance of physical activity in combating health issues, and as a result, significant efforts have been made to create an environment that encourages active lifestyles among its citizens.

In sub-Saharan economies, exercise performance faces unique challenges. A study by (Oyeyemi, 2016) reveals that sub-Saharan countries have reported an overall decline in physical activity levels, with a 15% decrease in adherence to recommended exercise guidelines over the last five years. Economic constraints, limited access to fitness facilities, and cultural factors often contribute to this decline.

In sub-Saharan African economies, exercise performance trends can be particularly challenging due to a wide range of factors, including economic disparities, healthcare infrastructure, and cultural diversity. A study published (Mokone, 2018,) suggests that several countries in this region have experienced a decline in physical activity levels, with a notable 8% decrease over the past five years. Limited access to fitness facilities, inadequate awareness campaigns, and the burden of infectious diseases are contributing factors to this trend. However, some sub-Saharan African countries have made efforts to promote exercise performance. For instance, Ghana has witnessed a 5% increase in physical activity levels among adults, as reported by (Owusu-Darko, 2019). This improvement can be attributed to government initiatives and public health campaigns. Overall, exercise performance in sub-Saharan Africa remains a complex issue that requires comprehensive strategies to address the unique challenges faced by this region.

Exercise performance in Nigeria has faced a variety of challenges and opportunities. A study published in by (Oyeyemi, 2016) indicated that physical activity levels in Nigeria have experienced a decline, with a 15% decrease in adherence to recommended exercise guidelines over the last five years. Factors such as limited access to fitness facilities, economic constraints, and cultural preferences have contributed to this decline. However, there are localized improvements, especially in urban areas, where the awareness of the importance of physical activity is growing. Government initiatives and the development of recreational facilities in some regions are beginning to address this issue and promote exercise performance among the population.

In Kenya, exercise performance has shown positive trends, particularly among the urban population. A study published by (Muthuri, 2019) reported an increase of 8% in physical activity levels among urban Kenyans over the past five years. This improvement is attributed to awareness campaigns, community-based exercise programs, and the development of public spaces for physical activity. However, rural areas continue to face challenges in meeting recommended exercise guidelines due to limited access to resources and healthcare infrastructure. Efforts are ongoing to bridge these disparities and promote physical activity throughout the country.

South Africa, as a prominent sub-Saharan African country, has been actively addressing exercise performance trends. A study published by (Sebati, 2019) highlighted government initiatives that have led to a notable increase of approximately 10% in exercise participation among adults over the last five years. These initiatives include public health campaigns, the development of accessible sports facilities, and community-based exercise programs. South Africa recognizes the importance of physical activity in combating health issues, and as a result, significant efforts have been made to create an environment that encourages active lifestyles among its citizens.

Music plays a vital role in enhancing exercise performance and can be categorized into various types, each with its unique characteristics and effects. One commonly recognized music type is "Upbeat and Energetic." This genre typically includes fast-paced songs with high beats per minute (BPM), such as pop, hip-hop, or electronic dance music (EDM). Studies have shown that upbeat

and energetic music can boost motivation, increase energy levels, and improve endurance during exercise (Karageorghis & Priest, 2012). The rhythmic qualities of these music types can synchronize with the body's movements, making it particularly suitable for activities like running, cycling, or high-intensity interval training (HIIT).

Another music type that influences exercise performance is "Calm and Soothing." This category includes genres like classical, acoustic, or ambient music. Calm and soothing music can have a relaxing effect, reducing anxiety and stress during workouts (Bishop et al., 2018). It is often preferred for activities that require focus, concentration, and controlled movements, such as yoga, Pilates, or stretching routines. The tranquil melodies and slower tempos of this music type can help individuals maintain a steady pace and optimize their performance in exercises that demand mindfulness and relaxation.

Problem Statement

Despite the widespread recognition of music as a potential enhancer of exercise performance and enjoyment, there is a notable research gap in understanding the specific impact of various music genres on college students' exercise experiences. While existing studies have explored the general effects of music during physical activities, there is limited empirical research that delves into the diverse preferences and responses of college students to different music genres during exercise sessions (Smith, 2018). This gap hinders the development of tailored and effective exercise interventions that harness the motivational and performance-enhancing potential of music, thereby impeding the optimization of college students' physical activity engagement and overall health outcomes."

Theoretical Framework

Arousal Theory

Originated by Yerkes and Dodson (1908), Arousal Theory posits that the relationship between arousal (or stimulation) and performance follows an inverted U-shaped curve. This theory suggests that moderate levels of arousal are optimal for performance, while too much or too little arousal can lead to decreased performance. In the context of the research topic, the theory implies that music with varying levels of arousal, such as fast-paced music for high arousal and soothing music for low arousal, can have different effects on exercise performance and enjoyment. College students engaging in exercise may experience improved performance and enjoyment when exposed to music that matches their optimal arousal levels (Vaezmosavi, 2018).

Attention Restoration Theory

Developed by Kaplan and Kaplan (1989), Attention Restoration Theory posits that exposure to natural environments or stimuli that require effortless attention can restore cognitive functioning and reduce mental fatigue. In the context of the study, it suggests that certain types of music, particularly those with a calming or nature-inspired theme, may enhance exercise enjoyment by providing a form of cognitive restoration. College students may benefit from music that allows them to mentally detach from their exercise routine, leading to increased enjoyment and sustained exercise performance (Barton & Pretty, 2010).

Expectancy Theory

Proposed by Vroom (1964), Expectancy Theory focuses on the relationship between effort, performance, and outcome expectancy. It suggests that individuals are motivated to exert effort when they expect that their efforts will lead to good performance, and good performance will result in a desired outcome. In the context of the research, college students engaging in exercise may have different expectations regarding the impact of music on their performance and enjoyment. This theory can help explore how varying types of music influence students' expectations and how these expectations, in turn, affect their exercise performance and enjoyment (Casselmann & Sodano, 2008).

Empirical Review

Terry (2017) influenced of music tempo variations on exercise performance and enjoyment among college students. They conducted a controlled experiment with participants engaged in physical activities while exposed to either consistent tempo music or music with dynamic tempo changes. Results revealed that individuals exercising to music with tempo variations exhibited significantly enhanced exercise performance. Additionally, participants reported higher levels of enjoyment and motivation during their workouts when exposed to music featuring tempo fluctuations. This underscores the potential of incorporating diverse tempo changes in exercise playlists to boost exercise effectiveness and foster greater enjoyment among college students (Terry, 2017).

Smith and Johnson (2018) explored the impact of different music genres, including pop, rock, and classical, on exercise performance and perceived exertion levels in college students. Their within-subject design involved participants engaging in exercise sessions while listening to various music genres. Findings indicated that exercise performance varied significantly depending on the music genre, with pop music being associated with higher exercise intensity. Furthermore, classical music led to reduced levels of perceived exertion during workouts. These results highlight the importance of tailoring music choices to individual preferences and fitness goals to optimize exercise experiences for college students (Smith & Johnson, 2018).

Chang and Lee (2019) combined effects of music tempo and volume on exercise intensity and mood during aerobic workouts among college students. They employed a randomized controlled trial with participants exposed to different music conditions, including fast-tempo music with low volume, slow-tempo music with high volume, and moderate tempo and volume music. The study demonstrated that fast-tempo music with low volume significantly increased exercise intensity and improved mood among participants during aerobic sessions. These findings suggest that adjusting both the tempo and volume of music in exercise settings can positively impact exercise outcomes and emotional experiences for college students (Chang & Lee, 2019).

Garcia (2016) examined the effects of personalized music playlists on exercise adherence and overall satisfaction with physical activity among college students. Over a 12-week intervention, participants were given the opportunity to create their own workout playlists. The study found that those who personalized their workout music were not only more likely to adhere to their exercise routines but also reported higher overall satisfaction with their physical activity experiences. This underscores the potential of encouraging college students to curate their own workout playlists as

an effective strategy for improving exercise adherence and overall satisfaction, ultimately promoting a more enjoyable and consistent exercise routine (Garcia et al., 2016).

Patel (2020) influenced of live music performances on exercise motivation and performance among college students participating in group fitness classes. Through group fitness sessions featuring live music and regular classes with recorded music, they assessed motivation, performance, and attendance. The study's results indicated that group fitness classes with live music significantly increased exercise motivation, performance, and attendance among college students. This suggests that the integration of live music into group fitness classes can be a highly effective strategy for enhancing exercise motivation and performance in college settings (Patel, 2020).

Wang and Chen (2017) focused on the effects of lyrical content in music on exercise motivation and enjoyment among college students. Participants engaged in exercise sessions while listening to music with positive, negative, or neutral lyrical content. The research revealed that music with positive lyrical content significantly enhanced exercise motivation and enjoyment, while music with negative lyrical content had the opposite effect. This study emphasizes the importance of considering lyrical content when selecting music for exercise routines, as it can significantly influence college students' motivation and enjoyment levels during physical activity (Wang & Chen, 2017).

Kim (2018) examined the impact of musical tempo synchronization with exercise rhythm on running performance and perceived effort among college students. Participants engaged in treadmill running sessions while listening to music with varying tempos. The study's findings demonstrated that music tempo synchronized with running rhythm significantly improved running performance and reduced perceived effort among college students. This suggests that incorporating music with tempo synchronization can optimize running performance and enhance the exercise experience for college students participating in running activities (Kim, 2018).

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Research Gap: While the studies have investigated the influence of music on exercise performance and enjoyment, there is a conceptual research gap in understanding individual music preferences and their impact on exercise outcomes, including psychological responses such as mood and motivation (Smith & Johnson, 2018). Future research could delve into how personalized music choices, beyond just genre and tempo, affect exercise motivation and

performance among college students. This could involve examining the emotional and cognitive aspects of music selection and their implications for exercise engagement.

Contextual Research Gap: Most of the studies focus on controlled exercise environments or specific types of exercise (e.g., aerobic workouts or treadmill running). There is a contextual research gap in exploring how music affects exercise outcomes in diverse exercise settings (e.g., yoga, team sports) and among college students engaged in a wide range of physical activities (Chang & Lee, 2019). Future research could investigate the role of music in different exercise modalities, considering the unique demands and experiences associated with various activities. Additionally, examining how music preferences interact with exercise settings to influence outcomes is an avenue worth exploring.

Geographical and Cross-Cultural Research Gap: The studies mentioned do not address potential cultural variations in the relationship between music and exercise outcomes. A geographical and cross-cultural research gap exists in examining whether the impact of music on exercise performance and enjoyment varies among college students from different cultural backgrounds, including those outside of Africa (Kim et al., 2018). Future research could explore how cultural factors, such as music traditions and cultural associations with exercise, interact with music choices and influence exercise experiences. Understanding these cultural nuances can provide valuable insights for tailoring exercise interventions globally.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effects of different types of music on exercise performance and enjoyment among college students. The participants were randomly assigned to one of four conditions: no music, classical music, pop music, or rock music. They performed a 20-minute cycling task at a self-selected intensity and rated their perceived exertion and enjoyment. The results showed that there were no significant differences in exercise performance among the four conditions. However, there were significant differences in enjoyment, with the rock music group reporting the highest level of enjoyment and the no music group reporting the lowest level of enjoyment. The classical music and pop music groups had similar levels of enjoyment, which were intermediate between the rock music and no music groups. These findings suggest that music can enhance the enjoyment of exercise among college students, but the type of music may not affect the exercise performance. Therefore, college students who want to increase their motivation and adherence to exercise may benefit from listening to their preferred music during exercise.

Recommendation

Theory

Conduct further research to delve into the specific impact of various music genres on exercise performance and enjoyment. This could include investigating the effects of classical music, hip-hop, electronic, and other genres to provide a more comprehensive understanding of how different musical styles influence physical activity. Extend the research to explore the underlying psychological mechanisms through which music affects exercise performance and enjoyment. Investigate factors such as mood regulation, attentional focus, and the role of music in enhancing

the mind-body connection during physical activity. Consider studying individual differences in music preferences and how they interact with exercise outcomes. Explore whether certain personality traits or demographic factors moderate the relationship between music and exercise, contributing to a more personalized approach to music selection for physical activity.

Practice

Develop practical guidelines for creating customized workout playlists based on individual preferences and exercise goals. Provide recommendations for tailoring music choices to specific types of exercise routines, such as cardio workouts, strength training, or yoga. Encourage fitness professionals and facilities to incorporate research findings into exercise programs. Gyms and trainers can offer music variety and options to cater to diverse preferences, enhancing the exercise experience for clients. Explore the potential of music-based interventions as a motivational tool for physical activity adherence and weight management programs. Develop evidence-based interventions

Policy

Advocate for the integration of music's role in exercise performance and enjoyment into physical education curricula at educational institutions. Encourage schools and colleges to recognize the importance of music as a motivational tool for promoting physical activity among students. Collaborate with workplace wellness programs to incorporate music into physical fitness initiatives. Advocate for policies that support the use of music in corporate fitness centers and wellness activities to improve employee engagement and well-being. Work with policymakers to streamline music licensing processes for public fitness spaces, parks, and recreational areas. Ensure that individuals have access to music during outdoor activities, promoting physical fitness in community settings.

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