

The Effect of Background Music on Perception in Children: A Study Using a Visual Closure Test

Pratanu Rakshit¹, Dr.Chitralkha Mehera²

¹Research Scholar, Education Department, The University of Burdwan, India.

²Professor Department of Education, The University of Burdwan. India.

ABSTRACT: This study investigated the impact of background music on children's perceptual abilities using a visual closure test. A total of 40 primary school students, aged 9 to 10 years (22 boys and 18 girls), were randomly selected from schools under the West Bengal Board of Primary Education. The participants were randomly divided into two equal groups: an experimental group and a control group, each consisting of 20 children. Initially, both groups were administered a visual closure test. After a ten-day interval, the experimental group was given a parallel version of the test while listening to instrumental background music (a non-lyrical version of the popular Rabindra Sangeet "Momo Chitte Nritye Nritye", whereas the control group performed the same task in silence. In both sessions, each child's test completion time was recorded individually using a stopwatch. The results showed that the children in the music group completed the test more quickly, indicating enhanced perceptual skills compared to those in the non-music condition. Furthermore, the findings revealed no significant difference in performance between boys and girls. In conclusion, the study suggests that non-lyrical background music may have a positive effect on children's cognitive performance, particularly by enhancing perceptual abilities during independent, nonverbal tasks.

Keywords: Background music, Cognitive task performance, Perception, Visual closure

1. Introduction

The connection between music and mood is profound. A joyful melody can lift our spirits, while a melancholic tune can evoke sadness or introspection. These emotional shifts are not just fleeting sensations; they actively shape the way we perceive the world around us. When individuals are in a happy state of mind, they tend to identify and respond more readily to positive cues, such as happy facial expressions or upbeat tones in speech. This is not merely a psychological curiosity; it's a reflection of how deeply mood can influence our perceptual systems.

Extensive research has consistently shown that mood significantly impacts perceptual processing. Our emotional state can change the way we focus our attention, process visual and auditory stimuli, and interpret our environment. For example, individuals experiencing positive moods are more likely to adopt a broader, more inclusive processing style. This means they are better at integrating diverse pieces of information, noticing peripheral details, and making more holistic judgments. In contrast, negative moods often lead to a narrower, detail-oriented processing style, where attention is more focused and less flexible.

Mood also plays a crucial role in how we interpret ambiguous or neutral stimuli. A person in a positive mood might view a neutral face as friendly or a vague comment as humorous. Conversely, someone in a negative mood might interpret the same stimuli as threatening or critical. This interpretative bias affects not only interpersonal

interactions but also how we perceive our physical environment, colours may seem duller, sounds more jarring, or spaces more confining when we're feeling down.

In essence, mood doesn't just colour our emotions; it reshapes our entire perceptual framework. Music, as a powerful modulator of mood, becomes a subtle yet impactful tool in influencing how we engage with and understand the world around us.

This dynamic interplay between mood and perceptual processing emphasizes the complex relationship between emotion and cognition in shaping our subjective experience of reality. It illustrates how our emotional states do not merely influence how we feel, but also play a critical role in how we interpret and respond to the world around us. As such, when studying perceptual phenomena or analysing human behaviour, it is essential to consider emotional influences alongside traditional cognitive factors.

One particularly compelling study conducted by Jacob Jolij and Maaike Meurs (2010) from the University of Groningen's Psychology Department further reinforces this point. Their research uncovered a remarkable connection between music and perception: individuals sometimes perceive emotional expressions, such as happy or sad faces even when no visual stimuli are actually present. Specifically, participants reported "seeing" smiling faces when listening to cheerful, upbeat music, and perceiving sad or frowning faces while exposed to sober, unpleasant melodies. This phenomenon suggests that music-induced mood not only alters perception of actual stimuli but can also generate entirely subjective visual experiences, driven purely by emotional and cognitive interplay.

In general, the primary purpose of the educational system at all levels is to develop cognitive skills like perception, attention, problem-solving abilities and creativity in learners. Many studies have reported that musical interventions may have a positive effect on perception. The suggestion has been made that music possesses therapeutic qualities that boost perception skills. For instance, rhythmic patterns direct focus, and elements like rhythm, melody, and harmony offer multifaceted stimuli that aid in attention shifting (Gardiner, 2005; Thaut and Gardiner 2014). Perceiving rhythmic, melodic, harmonic, and dynamic patterns in music could impact how we focus and organize our attention flow (Thaut et al., 2008). Perception serves as a fundamental skill for optimal cognitive functioning, so that playing a crucial role in the development of cognitive, social, and communication abilities.

Music has been a powerful tool for improving children's emotional, cognitive, and communication skills in recent decades. Children's musical responses, according to many experts and trainers, are the most impromptu and organic replies and are crucial in a variety of learning domains (Burnard, 2000). In general, the primary purpose of the educational system at all levels is to develop cognitive skills like attention, perception, problem-solving abilities and creativity in learners. Perception is the process by which our brain interprets and organizes sensory information from the environment to form a meaningful understanding of the world around us.

In simpler terms, perception is how we make sense of what we see, hear, smell, taste, and touch. It involves **Sensation** – Receiving raw data from the senses (e.g., light entering the eyes, sound waves reaching the ears). **Processing** – The brain processes this sensory input using past experiences, expectations, and context. And **Interpretation** – The brain gives meaning to the sensory data, allowing us to recognize objects, sounds, emotions, etc.

Music is crucial in our lives and has played an important part in many activities. Several studies have shown that music can help youngsters develop by improving their cognitive skills (Anuar and Ismail, 2021; Ismail and Auar, 2020). When used constructively, music may have a good impact on a child's development and assist them in a variety of ways. One of its primary characteristics is its capacity to elicit a range of emotions during active involvement (El Haj, Postal, and Allain, 2012; Hallam 2008).

In this study researcher wants to find the effect of background music without lyrics on children's perception (visual closure) among the children of class IV (age group 9-10 years) under West Bengal Board of Primary Education. The selected background music was a famous Rabindra sangeet "Momo Chitte Nritye Nritye".

2. Objective

1. To assess the effect of background music without lyrics on perception of children of age group 9-10 years.
2. To access the effect of background music without lyrics on perception in reference to gender.

3. Hypothesis

1. Significant effect of background music without lyrics exists on perception of children of age group 9-10 years.
2. Significant difference exists on the effect of background music without lyrics on the perception in reference to gender.

4. Hypothesis in null form-

1. There will be no significant difference between the effect of background music without lyrics and no background music on perception of children of age group 9-10 years.
2. There will be no significant difference between the effect of background music without lyrics and no background music on perception in reference to gender.

5. Methodology

In this study the investigator used pre-test post-test control group design. 40 children of age group 9-10 years were taken for this study. At first all the children were given the visual closure test (identify partial deleted pictures) without any background music. The time of completion of task was measured individually using stop watch. On the basis of pre-test score the two groups, Experimental and Control were matched. The groups were matched also reducing the effect of socio demographic and others effect. Ten days after the completion of pre-test the experimental group was given parallel form of the visual closure task with background music. The control group was also given the parallel form of visual closure task without background music. The time of completion was also measured individually as in the pre-test. The background music used by the investigators was a famous Rabindra Sangeet 'Momo Chitte Nritye Nritye'.

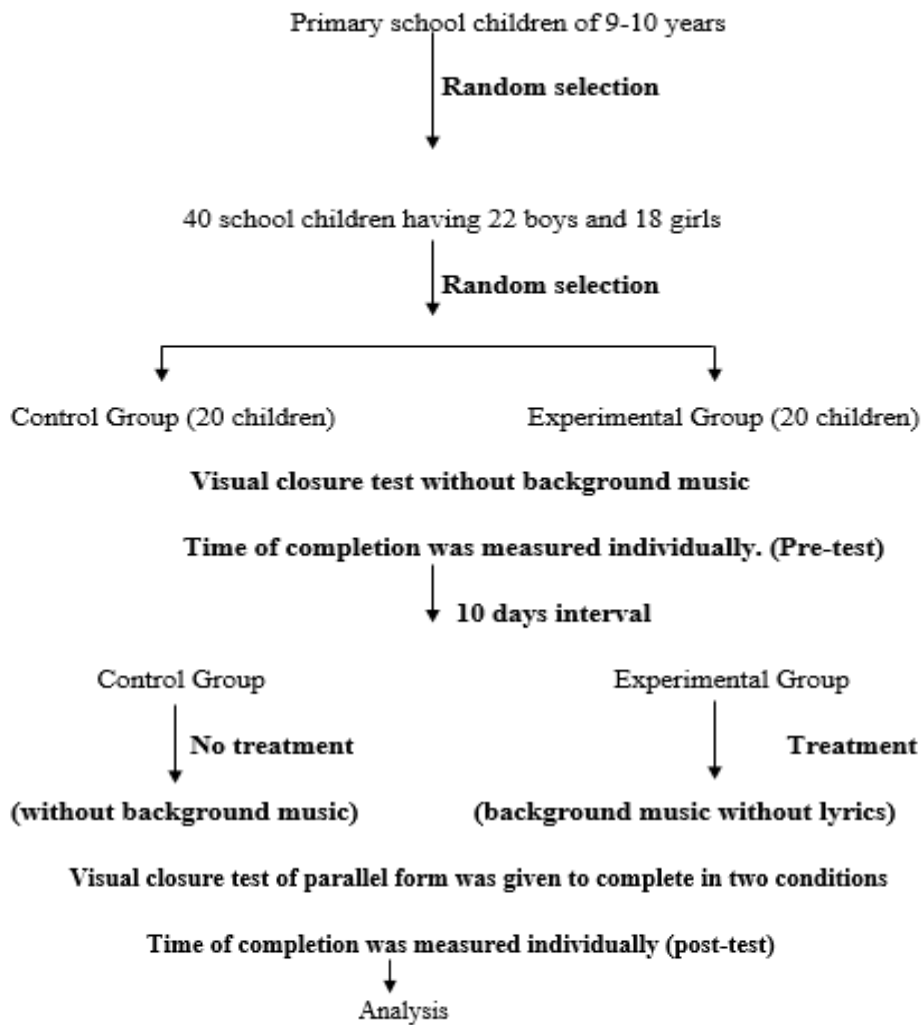
6. 7.Data Collection-

In this study, the sample was composed of 40 children, aged 9 to 10 years, who were evenly divided into two groups: an **experimental group** and a **control group**, with 20 children in each. To establish a baseline, a **pretest** was conducted wherein both groups were individually administered a **visual closure task**, designed to assess their perceptual abilities. The **completion time** for each child was carefully recorded using a stopwatch, ensuring precise measurement of task performance.

Following the pretest, a gap of **ten days** was maintained before conducting the **post-test**. During the post-test phase, both groups were given a **parallel form** of the original visual closure task, ensuring content equivalence while avoiding task repetition. The experimental group completed the task in the presence of **non-lyrical background music**, while the control group performed the same task **without any background music**.

In both conditions, the **completion time was measured individually using a stopwatch**, maintaining consistency with the pretest procedure. This approach allowed for a reliable comparison of performance across both time points and conditions. The collected data provided the basis for analysing the impact of non-lyrical background music on the perceptual task performance of children.

6. Research design- Pre-test-post-test control group experimental design.



7. Result and Discussion

Table 1- Shows the t value difference between mean time taken to complete the pretest by the control and experimental groups along with the relevant measures.

Groups Measures	Pre test	
	Control	Experimental
N	20	20
M	3.081	3.014
SD	0.204	0.227
SED	0.06	
t	1.20*	

t value (1.20) shows no significant difference ($p > .05$) in the completion time of pre task between the two groups depicting that two groups are symmetrical.

Table 2- Shows the t value difference of the meantime taken to complete the pre and post-test by the control group along with the relevant measures.

Groups Measures	Control group	
	Pre test	Post test
N	20	20
M	3.081	3.145
SD	0.204	0.150
SED	0.05	
t	1.00*	

t value (1.00) shows no significant difference ($p > .05$) in the completion time of pre task and post task of control group.

Table 3- Shows the t value difference of the meantime taken to complete the pre and post-test by the experimental group along with the relevant measures.

Groups Measures	Experimental	
	Pre test	Post test
N	20	20
M	3.014	2.672
SD	0.227	0.308
SED	0.07	
T	5.22**	

t value (5.22) shows significant difference ($p < .01$) in the completion time of pre task and post task of experimental group.

Table 4- - Shows the t value difference of the meantime taken to complete the parallel form of visual closure test by the post control and post experimental groups along with the relevant measures.

Groups Measures	Post test	
	Control group	Experimental Group
N	20	20
M	3.145	2.672
SD	0.150	0.308
SED	0.07	
t	7.25**	

t value (7.25) shows significant difference ($p < .01$) in the completion time of post task between two groups.

Table 5- Shows the t value difference of the meantime taken to complete the pre-test by the boys and girls along with the relevant measures.

Groups Measures	Pre test	
	Boys	Girls
N	22	18
M	3.018	3.089
SD	0.226	0.208
SED	0.06	
t	1.00*	

t value (1.00) shows no significant difference ($p > .05$) in the completion time of pre task in reference to gender.

Table 6- Shows the t value difference of the meantime taken to complete the post-test by the boys and girls along with the relevant measures.

Groups Measures	Post test	
	Boys	Girls
N	22	18
M	2.931	2.880
SD	0.313	0.374
SED	0.09	
t	1.00*	

t value (1.00) shows no significant difference ($p > .05$) in the completion time of post task in reference to gender.

8. Findings

The *t*-values obtained from the statistical analysis of the three data tables (Table 2, Table 3, and Table 4) confirm the positive effect of background music without lyrics on the perceptual abilities of children aged 9 to 10 years. Specifically, the results indicate that the null hypothesis which posited that background music without lyrics has no effect on children's perception is rejected. Consequently, the alternative hypothesis is accepted, affirming that non-lyrical background music does indeed enhance perceptual performance, as reflected in improved completion times for visual closure tasks.

In addition to these findings, the data also reveal that there is no statistically significant difference in completion time based on gender in the presence of background music. This suggests that the facilitative effect of non-lyrical music on perception is consistent across both boys and girls within this age group. In other words, gender does not appear to influence how children respond to background music in the context of perceptual task performance.

9. Conclusion

The findings suggest that background music without lyrics has a positive effect on the completion time of visual closure tasks, indicating an enhancement in perceptual processing efficiency. This implies that non-lyrical background music can facilitate cognitive functions related to visual perception, particularly in tasks that require the recognition of incomplete visual information.

Given this, incorporating instrumental background music into classroom environments may serve as a beneficial strategy to support the development of perceptual skills in children. Since perception is a foundational element

of learning—particularly in reading, writing, and spatial reasoning—enhancing it through such non-intrusive auditory stimulation could contribute to improved academic performance and cognitive development.

Furthermore, as lyrical music can be distracting due to the involvement of language processing, non-lyrical music appears to offer a more conducive background environment for focused cognitive tasks. Educators and curriculum developers may consider integrating carefully selected instrumental music during specific classroom activities aimed at enhancing perception and concentration.

10. References

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Corresponding Author: [Pratanu Rakshit](#), Research Scholar, Education Department, The University of Burdwan, India.

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