

Effect of Genre Music on Concentration

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Abstract: Music consists of various types based on their respective characteristics. Previous research has suggested that music has an influence on human concentration. However, from various types of music, whether all music has an influence on concentration or only certain music depends on a person's musical taste. Concentration refers to the concentration of thought which includes accuracy (precision) and speed of reaction time. This study aims to analyze the effect of music type on accuracy and reaction time on concentration and determine the type of music that has the most effect on concentration. The experimental design used is repeated treatment design with 10 research subjects who are Industrial Engineering students Class of 2019. The variables used in this study are the type of music consisting of pop, jazz, dangdut, rock and classical as the independent variable and concentration as the dependent variable. Concentration is measured by the Stroop Test as a cognitive task and the test results measured in the form of accuracy and reaction time to the Stroop Test. Data processing was done with repeated measure anova and Friedman test. The results of data processing show that the type of music has an influence on reaction time with a sig value of 0.044. The type of music that has the most influence on reaction time is the type of music preferred, namely pop music. While the test results of the effect of music type on accuracy have a sig value of 0.044.

Keywords: Music Type, Concentration, Stroop Test, Experimental Design

1. Introduction

Every human being is created by God as a special creature that has cognitive abilities that differentiate it from other living things. In simple terms, cognitive is defined as thinking or the ability to think. Cognitive becomes the center of human thinking in controlling their thoughts and behavior. Cognitive function refers to brain activity that leads to knowledge to obtain information which includes thinking, concentration and memory (Limayati et al, 2018).

According to Andita & Desyandri (2019) Concentration is an effort made by someone to focus attention on an object so that they can comprehend and understand the object of attention. Concentration means a state of mind activated by sensations in the body (Algarini Allo et al., 2021). Concentration has an important role in the process of thinking and understanding a problem. In addition, concentration can affect student learning outcomes. Students who have good concentration tend to get better learning outcomes than students who have low concentration (Algarini Allo et al., 2021).

Factors that inhibit concentration according to Nugroho (in Meutirani, 2018) are non-conducive environment, health conditions and boredom. In the learning process, students often feel bored which makes the focus on the material being explained disturbed. Boredom in the classroom makes students do other things such as playing cellphones, daydreaming and even falling asleep which disrupts concentration in learning. A person's concentration level can be measured using the Stroop test.

The stroop test utilizes the primitive operations of cognition, offering clues to the basic processes of concentration (MacLeod, 1991). The Stroop test is well known because it has great impact and is always statistically reliable (MacLeod, 1992). The measurement tools used to measure concentration in the stroop test are reaction time and accuracy. Reaction time refers to the speed at which a person processes information and responds to it. Accuracy refers to the correctness of the answer given to the information. To increase concentration can be done by using music, as has been done by (Haque1 et al., 2020a) who were able to increase learning concentration by using music.

Music is an art that describes human thoughts and feelings. Music can make everything fun, bring joy and music has a certain rhythm (rhythm), melody, timbre that helps the body and mind work together (Dwi Andita, 2019). Music has many benefits including being able to balance the performance of the left brain with the right brain. Music can also balance emotional, intellectual and spiritual intelligence. In addition, music can provide a calm and comfortable learning environment (Suci, 2019). Music can also affect the heart rate of the listener so that it can give a sense of calm to the mind and become a tool for the development of human intelligence (Wulansari et al., 2019).

Music is categorized based on the similarity between one music and another or called a music genre (Sarofi, Irhamah & Mukarromah, 2020). Types of music that are favored include classical music, dangdut, pop, indie, metal, and rock (Fatihah et al., 2019). The percentage of music that is most favored is dangdut at 58.1% and pop at 31.3% (Databoks, 2022). Pop music is a type of music that has a simple rhythm so that it is easily recognized and liked by the general public (Pasaribu & Astriana, 2020). Jazz music is a genre of music that is played without using written notes, but by relying on spontaneous creativity (Rahman, 2021). Dangdut music is characterized by its drum sound (Haque1 et al., 2020). strong, dominated by electric or acoustic guitars.

Classical music is highly complex, mathematical, structured, harmonious, creative, and improves spatial intelligence. Music can affect humans physiologically and psychologically where different types and rhythms of music will have different impacts on worker productivity (Palit et al., 2014). This is supported by research by Fretes (2021) where the results of his research explain that popular music is chosen by many teenagers because of the lyrics of songs that make it easy for listeners to interpret and enjoy the music. powerful, dominated by electric or acoustic guitars. Classical music is highly complex, mathematical, structured, harmonious, creative, and improves spatial intelligence. Music can affect humans physiologically where different types and rhythms of music will have different impacts on worker productivity (Palit et al., 2014). This is supported by research by Fretes (2021) where the results of his research explain that popular music is chosen by many teenagers because of the lyrics of songs that make it easy for listeners to interpret and enjoy the music.

In a research (Kim, 2022) on the effect of music on accuracy in the stroop test with Mozart and rock classical music resulted in Mozart and rock classical music having a positive and negative influence on the accuracy of the stroop test. In addition, research (Nagpal et al., 2019) on the effect of music on reaction time shows the results of the fastest reaction time when listening to soft music at high volume compared to hard rock music.

The relationship between music and concentration has been proven by research (Liu et al., 2021) on background music played in an open workspace using six different sound types and specific sound intensities. It was found that sound type and sound intensity significantly impacted concentration accuracy and verbal reasoning, but the noise group showed a higher loss of task performance. This suggests that sound type and sound intensity have an influence on concentration and verbal reasoning in an open workspace.

From previous research, it can be seen that music has an influence on improving human cognitive function. However, music consists of various genres so it is necessary to study which music genre has an influence on the cognitive function of students. In this study, pop, jazz, dangdut, rock and classical music genres were tested using the Repeated Treatment Design experiment. Repeated Treatment Design is an experimental design used to test

an effect of one or more treatments repeated on the same subject (Rosita, 2009). The cognitive task used to measure concentration is the stroop test which will be measured based on the level of accuracy and reaction time. The purpose of this study is to determine the effect of the type of music on the accuracy of answers and reaction time on the concentration task and to determine the type of music that has the most effect on concentration. So that the results of this study will show the effect of the type of music on the level of accuracy and reaction time on cognitive performance.

2. Research Method

This research is an experimental research with the experimental design used is Repeated Treatment Design with within subject. The analysis method used, namely repeated measure anova and Friedman test. The subjects were active students of Industrial Engineering at Sebelas Maret University Class of 2019 as many as 10 people including 6 women and 4 men with an age range of 19-23 years. In addition, the subject requirements in this study are not color blind either partially or totally and have normal blood pressure during the study.

The experimental design used in this study can be seen in table 1 below.

Tabel 1 Experimental Design

Subject	Day/Genre Music				
	1	2	3	4	5
	Pop	Jazz	Dangdut	Rock	Klasik
1					
2					
.					
.					
.					
10					

The variables used consist of one independent variable and one dependent variable. The independent variable used in this study is the type of music. The types of music used were pop, jazz, dangdut, rock and classical instruments. While the dependent variable used is concentration.

The measuring instrument used to measure cognitive performance is the Stroop Test. Stroop Test is a neuropsychological instrument used to measure a person's cognitive performance. The software used in this research is design tools for methods standards and work design (11th ed.) from Benjamin Niebel and Andris Freivald.

The instruments assessed in this study are accuracy and reaction time. The accuracy rate is calculated from the number of colors answered correctly. Meanwhile, the calculation of reaction time starts from the appearance of the stimulus until the participant mentions the color of the word. The participant's response is assessed as reaction time written in milliseconds.

3. Result and Discussion

3.1 Stroop Test Results by Accuracy Level

The results of research on the effect of music genre on cognitive performance using the stroop test can be seen based on the accuracy rate. The accuracy rate shows the number of colors answered correctly by the subject. Of the 5 types of music tested, namely pop, jazz, dangdut, rock and classical have different results even though they do not have a far different average difference.

Friedman test is used to test the difference in stroop test results based on the level of accuracy. The results of the Friedman test can be seen in Figure 1 below.

Test Statistics^a

N	10
Chi-Square	5.807
df	4
Asymp. Sig.	.214

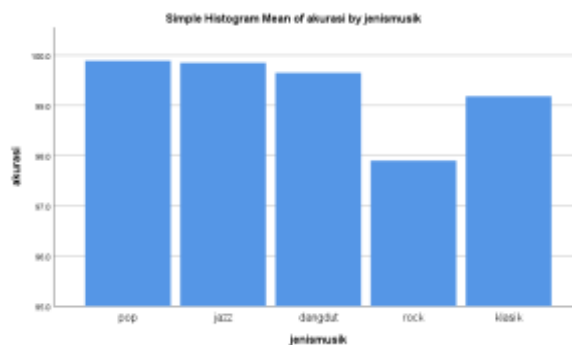
a. Friedman Test

Figure 1 Friedman test

From the results of the Friedman test shows that the sig value > 0.05 which means hypothesis one is rejected and the null hypothesis is accepted which means there is no effect of music genre on cognitive performance based on the level of accuracy. Based on statistical tests it cannot be proven that there is an effect of music genre on cognitive performance based on the level of accuracy. This is because the data on the level of accuracy does not have a significant difference in value between types of music.

However, if analyzed based on the average value, it can be seen in Figure 2 below which is presented in the form of a histogram

Figure 2 Histogram of Stroop Test Results by Accuracy Level



Based on the overall average value of the subject on the accuracy results in Figure 2 above, it shows that pop and jazz music types have the same average and are higher than other types of music. Meanwhile, dangdut, rock and classical music types have an average value below pop and jazz music types. Rock music has the lowest accuracy level of other music types. These results are in accordance with Kim's research (2022) which shows rock music has a negative effect on the level of accuracy in the stroop test.

3.2 Stroop Test Results based on Reaction Time

The results of research on the effect of music genre on cognitive performance can be seen based on reaction time. Reaction time shows the time it takes for the subject to respond to the answer of the color that appears on the stroop test. The less time it takes to respond to the color on the stroop test indicates the faster the reaction time needed to answer the stroop test questions. Vice versa, the more time it takes to respond to the colors in the stroop test indicates the longer the reaction time needed to answer the stroop test questions. Of the 5 types of music tested, namely pop, jazz, dangdut, rock and classical have different reaction times.

Table 2 Repeated Measure Anova Test

Tests of Within-Subjects Effects						
Measure:	MEASURE_1					
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
factor1	Sphericity Assumed	0.522	4	0.130	3.617	0.014
	Greenhouse-Geisser	0.522	2.127	0.245	3.617	0.044

Based on Table 2 repeated measure anova test on greenhouse-geisser shows that the sig value on the music type variable is 0.044. This means that the sig value < 0.05 , so that the test hypothesis of the effect of music type on cognitive performance based on reaction time, namely H_0 is rejected and H_1 is accepted, which means that there is an effect of the effect of music type on cognitive performance on reaction time.

The test results are in accordance with the research of Chundakal, et al (2021) where there is a significant difference in reaction time between classical music and heavy metal in frenkel training. In addition, the test results are also in accordance with the research of Anwar, et al (2022) which says music has a positive influence on reaction time.

In addition, the results regarding the average reaction time can be seen in figure 4 below.

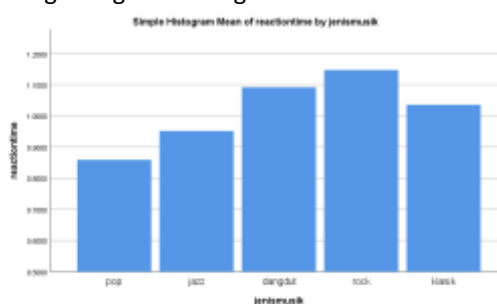


Figure 4 Histogram of Stroop Test Results based on Reaction Time

Based on Figure 4 histogram of stroop test results based on reaction time above, it can be seen which type of music has the most influence and no influence on reaction time. The average value of reaction time shows that pop music has a faster reaction time than jazz, dangdut, rock and classical music. The slowest reaction time is obtained by the average value of reaction time on the type of rock music. This is in accordance with Nagpal and Gupta's (2019) research on slow and hard rock music with different volumes showing that slow music with high volume has a faster reaction time.

4. Conclusion

The conclusion of this study is that the type of music does not have a significant influence on the level of accuracy with a sig value of 0.241. However, based on the average value, it can be seen that pop and jazz music types have a higher average accuracy rate than dangdut, rock and classical music types. In addition, rock music has the smallest average value of accuracy. In reaction time, the type of music has a significant influence on reaction time with a sig value of 0.044. In addition, from the pairwise comparison test results, it was found that pop music had the fastest reaction time compared to other types of music.

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