Effect of Background Music on Creative Task Performance

Malhari vs. Mozart

Jonathan John Biju, Celesty Winifred Perez, Ranjani Ramadoss
UG student, UG student, UG student
Bachelor of Arts in MPE (Music, Psychology, English)
CHRIST(Deemed to be University), Bengaluru, India

Abstract: Inspired by research linking music to mood influencing, and the popular studies of the "Mozart effect", the purpose of this research was to find out the effect of background music on creative task performance. Most of the research fields tends to focus on the western perspective. To choose a comparative study with Indian and western classical music and to find its effect in creative task performance and flow, was the goal and objective of this study. (Soc and Med, 2001). In 2017, Ritter and Ferguson found that people were more creative when listening to music they thought was positive, coming up with more unique ideas than the people who worked without music. "We also tested other musical excerpts that were sad, anxious and calm, and didn't see this effect," says Ferguson. "It seems that the type of music present is important, rather than just any music." (Ritter SM, 2017)

This research assumed a quasi-experimental method. The participants (between the ages of 18-21) were chosen after a survey questionnaire and an IQ test (Raven's Standard Progressive Matrix), since we found intelligence and creativity to be co-relational. (Jauk E1, 2013 Jul). A set of 30 participants were selected for the study, with varying levels of musical affinity, making it a cross-sectional ex- post facto research. The participants were tested on a verbal and non-verbal creativity test on the effects of background music in 3 groups for comparison: music of Mozart, music in Malhari and no music.

On completion of the research, the findings outlined that listening to background music has an effect on creative task performance, and listening to Indian classical instrumental music has a slightly different effect on creative task performance as compared to listening to western classical instrumental music. However, the difference was not significant enough to effect a change in hypothesis, maybe due to the small sample size adopted.

"People in lots of contexts use music to help them work," says Ferguson. A better understanding of how different types of music affect creativity is likely to be useful for many people, he says. Hence, positive scientific use of our findings could benefit all listeners in improving creative flow and productivity. Art has also been proved to have a positive impact on employee engagement and productivity. This research benefits organisations looking to enhance workplace environment to induce creativity and novelty.

Index Terms: **background music, creativity, Mozart effect, flo**w

I. INTRODUCTION

I. 1. Background

Music is the expression of the emotions that cannot be expressed and it, it brings out the voice of the soul and builds up the harmony of the society. Music has a lot of effect on the mind, in recent times, the Mozart effect has been a booming field into research.

The purpose of this research was to find out the effect of background music on creativity. To present how Malhari music differs from a piece of Mozart. Since most of the research fields tend to focus on the western perspective, this comparative study with Indian and western classical music aimed to bring out the understanding of how creativity is influenced in two different contexts. According to the Collins Dictionary of Sociology, creativity is defined as "the aspect of intelligence characterised by originality in thinking and problem-solving. Creative ability involves the use of divergent thinking, with thoughts diverging towards the solution in a number of directions. Test of creativity typically requires the generation of as many appropriate responses as possible to a simple situation. (The Collins Dictionary of Sociology, 2012)

Creativity differs from individual to individual, so to find a common platform, there is an IQ test given. The participants with "average" to "superior" IQs were selected for this research. There is substantial evidence that many more creative acts are performed by persons with high IQ than by persons with moderate or low IQ's. Despite the fact that intelligence appears to be a necessary condition, it is probably not a sufficient condition, since many persons of high IQ give little evidence of creativity in their work. (Madaus, Jan 1971)

How is creativity related to music?

Recent work by Rauscher and other investigators on the so-called "Mozart effect," in which students listening to Mozart regularly or learning how to play musical instruments scored higher on visual problem-solving tests, suggests that something like this phenomenon may be going. Music plays a special role because it can simultaneously be kinaesthetic, emotional, analytical and sensory. "Music is unique in combining quality and quantity precisely and spontaneously so that sense-impression can be measured and proportion can be experienced," writes Siegmund Levarie. "The human sense of hearing has remarkable powers of pattern recognition," adds chemist Robert Morrison, "but hearing has largely been ignored as a means of searching for patterns in numerical data" that musical and scientific abilities Rene are what is called "correlative talents". By correlative talents, it means skills and abilities in several different areas that can be integrated to yield surprising and effective results. (Root-Bernstein, 2001).

What is flow?

"Flow — the mental state of being completely present and fully immersed in a task — is a strong contributor to creativity. When inflow, the creator and the universe become one, outside distractions recede from consciousness and one's mind is fully open and attuned to the act of creating." (Scott Barry Kaufman, 2011)

According to a study conducted by Robert S. Root-Bernstein in 2001, ”So, if we are to succeed in understanding creativity, we must understand the polymathic people and their multiple talents. We must understand how to deal with integrative intersections in the field of creativity, where music and science meld too completely to be differentiable. Inventions are a result of a continuum of experiences that necessitate the rethinking and re-categorisation of all that went before."(Root-Bernstein, 2001).

I. 2. Rationale behind the study

Creativity can have a powerful effect on the human brain. Viewing art can stir strong emotions and deep thoughts, stimulating the brain in profound and often long term ways, while music affects the brain emotionally simply because specific brain circuits are wired to respond to it. When music and art were big players in businesses, music was used to create a pleasant ambiance for shoppers or to brighten up dull offices.

Today, backed by findings from numerous research studies, organisations are much more strategic in their use of art and music to influence consumer behaviour, staff performance, and ultimately the bottom line. Art as a whole (including music) has a positive impact on employee engagement and productivity.

Simone Ritter at Radboud University in the Netherlands, and Sam Ferguson, at the University of Technology in Sydney, Australia, have been studying the effect of silence and different types of music on how we think. "People in lots of contexts use music to help them work," says Ferguson. A better understanding of how different types of music affect creativity is likely to be useful for many people, he says. They put 155 volunteers into five groups. Four of these were each given a type of music to listen to while undergoing a series of tests, while the fifth group did the tests in silence. The tests were designed to gauge two types of thinking: divergent thinking, which describes the process of generating new ideas, and convergent thinking, which is how we find the best solutions for a problem.

Ritter and Ferguson found that people were more creative when listening to music they thought was positive, coming up with more unique ideas than the people who worked in silence. "We also tested other musical excerpts that were sad, anxious and calm, and didn't see this effect," says Ferguson. "It seems that the type of music present is important, rather than just any music." (Ritter SM, 2017)

I. 3. Objective

With all this existing research information to back the study up, we were interested in studying how the different elements of western and Indian classical music affect the creative work of young adults.

I. 4. Hypotheses

Hypothesis assumed before study:

H:1 Listening to background Music has an effect on creative task performance

H:2 Listening to Indian classical instrumental music has a slightly different effect on creative task performance as compared to listening to western classical instrumental music

II. RESEARCH METHODOLOGY

This research assumed a **quasi experimental** method. The first phase was assessing a survey provided to the potential subjects regarding their passion for music (independent variables such as musicianship, ethnicity, passion/liking for music, significance of music are presented, hence quasi experimental). We then invited a number of subjects (as many as were interested, sorted into 3 groups),

made sure they were comfortable, and administered the IQ test to the subjects. We then conducted the Creativity test on all the groups with 3 different conditions:

Group 1: Mozart music was played in the background

Group 2: Malhari music was played in the background

Group 3: No music was played in the background when the creativity test is being attempted

We then selected a number of subjects (10 per group) based on the IQ test results (average or above-this was the inclusive criteria for the study). The final phase was the comparison and analysis of the results to find out what affects creativity.

II. 1. Sample: Participants

There were a total of 30 participants in the experiment. 76.7% (23) of the test subjects were female and 23.3% (7) male. The age group selected for the study was 18-21 years. Equal number of participants (8) were 18 and 20 years old (26.7%) and an equal number (7) were 19 and

21 years old (23.3%). 96.6% (29) of the participants were Indian, with just 1 (3.4%) being Nepali. All the subjects were from the institution of Christ. 20 (66.7%) of the participants had received education in music while the remaining had not. Of those with music education, the participants had equally varied experience in music from 1 year up to 10 years.

II. 2. Research Instruments

Raven's Standard progressive Matrix (SPM) was used to measure IQ and Ahuja's creativity test was used to measure creativity (both verbal and nonverbal). Electronic devices were used to play music.

Music Selected:

1. Mozart: The first movement (Allegro con spirito) of Mozart's Piano for Two Pianos in D major
2. Pandit Hari Prasad Chaurasiya: Miyan Ki Malhar, Malhar Chandrika (The raag malhari is reputed among Indian classical musicians to be very soothing and improve focus. It is also very pleasant)

II. 3. Research Design

This research was a cross-sectional, ex post facto study. It involved comparison of 3 different focus groups based on dependent and independent variables at one point in time (cross-sectional, with existing level of musical skill as the pan factor) It also involved non-random assigning of subjects into various

groups to examine effect of the background music (quasi experimental) and the examining of existing influential factor of music on creative flow (Ex post facto).

II. 4. Data Analysis

Due to the nature of the data, the quantitative test used to analyse it was nonparametric. The Independent: sample Kruskal-Wallis Test test was used to produce the hypothesis decision. The mean and Standard deviation of the creativity scores of the three test groups were also found and form the descriptive statistics.

II. 5. Ethical Considerations

1. Voluntary participation and informed consent debrief the participants on the research and also informs them clearly that the participation is completely voluntary and they are free to discontinue participating in the research at any time they want.
2. Privacy of the participant: The participants are also informed that the data would not be using any information which would allow anyone to know the identity of the participant during or after the research.

III. RESULTS AND DISCUSSION

Table 1 :

Kruskal Wallis test results

Null Hypothesis	Test	Sig.	Decision
The distribution of Non Verb is the same across categories of music	Independent Sample Kruskal-Wallis Test	861	Retain the null hypothesis
The distribution of the Verb is the same across categories of music	Independent Sample Kruskal-Wallis Test	477	Retain the null hypothesis

Asymptotic significance are displayed. The significance level is 0.5

In Table 1, Non Verb and Verb stand for Non-Verbal and Verbal creativity test scores respectively. The results were not significant enough to prove the hypothesis. This we believe is due to the small sample size

adopted for the study. However, in the descriptive statistics there are differences when we look at Table 2, 3 and 4 below.

Table 2:

The Mean comparison of the creativity scores of No Music group subjects

	N	Minimum	Maximum	Mean	Std. Diviation
Non Verbal	10	18.00	103.00	46.7000	27.01461
Verb	10	32.00	103.00	60.1000	19.92458
Valid N	10				

Table 3:

The Mean comparison of the creativity score of Malhari group subjects

	N	Minimum	Maximum	Mean	Std. Diviation
Non Verbal	10	24.00	84.00	50.3000	21.87871
Verb	10	49.00	158.00	73.3000	37.72135
Valid N	10				

Table 4 :

The Mean comparison of the creativity score of Mozart group subjects

	N	Minimum	Maximum	Mean	Std. Diviation
Non Verbal	10	29.00	92.00	47.7000	21.53060
Verb	10	30.00	104.00	57.0000	22.45984
Valid N	10				

In conclusion, we believe that though the study was quantitatively inconclusive, there are interesting inferences to be drawn from such a comparison between Indian classical and western classical music and their effect on creative task performances.

III. 1. Discussion

The results of the creativity test told us that the highest mean scorers were the group listening to Indian classical music, followed by the group listening to Mozart and no music at all, which were very close. The participants listening to Mozart did slightly better than the ones not listening to music, which supports the Ritter-Ferguson study cited earlier. However, the hypothesis remains null as the results were not significant enough to prove it. This might be due to the fact that the sample size of the study was too small (30 participants total-10 in each group) to facilitate scientifically consequential findings. However, the study does go to show that background music might have an enhancing effect on creativity that can be explored much further, especially with regard to what type/genre of music is employed. Using Indian classical music in comparison to western classical music did yield us a slightly different and positive result. The same can be tested with a bigger group of participants for some interesting understandings into the human intellectual relationship with music. All the participants of the study were similar in range of their IQ, yet ended up scoring differently on the creativity tests, despite the conventionally strong relationship between IQ and creativity. However, each sample group had participants of all levels of musical experience, randomly assigned, to see if the results would still be different from one another, which they were. So it does seem that musical skill/ experience does not necessarily affect how the individuals respond to background music while attempting to perform a creative task. A limitation we must concede is genre bias - some participants may have disliked or held anexisting bias against the kind of music they were music (even though they might never have heard the particular pieces played before) which might have affected their creative response.

The results of this study or similar studies to be conducted in the future could be beneficial in the designing of atmospheres conducive to creativity and artistic stimulation. Music has the power to greatly change our lives and behaviours, and as more and more research is being done in the field, this calls for the exploration for one of the transformative effects of music, more related to creativity and intelligence rather than emotional regulation or mental well-being.

IV. SUMMARY AND CONCLUSIONS

In summary, this study helped us understand that the type of music listened to can have differences in it effects of emotional regulation, relaxation and creative stimulation. The effects of Indian classical music and its therapeutic and stimulative properties has not been explored intensively in India, something we believe must change. As a culture that is very rich in its research into the properties of the mind, body and soul the fact that India has always had an oral culture and its research not having been well-documented, a lot of important knowledge has been lost to humanity. This study was a small attempt at beginning to rediscover the same using the empirical practices of the West that are globally accepted.

Though the study was not conclusive of a significant difference between the three test groups (Malhari, Mozart and No music), we believe such research has great potential in terms of providing avenues for greater advancements in the study of the human relationship with music and its repercussions on creativity and expression.

V. ACKNOWLEDGMENTS

We are grateful to our supervisor Dr. Smitha A G and our teacher Dr. Tavis Ashton-Bell for their guidance in the making of this research paper. We also thank all the participants for their valuable contribution and time. We thank CHRIST (Deemed to be University) for the space, resources and support provided to us to conduct our research.

VI. REFERENCES

[1] Barnett, B. N. (n.d.). *"Scientists and Musicians,"* . 1956: Science Teacher 23 . Jary, D., & Jary, J. (2012). *Collins dictionary of sociology.* Glasgow: Collins.

[2] Jauk E1, B. M. (2013 Jul). The relationship between intelligence and creativity: New support for the threshold hypothesis by means of empirical breakpoint detection. *Intelligence*, 41(4): 212-221.

[3] Kaufman, S. B. (2011, November 11). *huffpost.* Retrieved from Huffpost website: http://www.huffpost.com/entry/consciousness-and-flow_b_1108113/amp

[4] Madaus.J.S. (Jan., 1971). An Analysis of Two Hypotheses Concerning the Relationship between

[5] Creativity andIntelligence. In *The Journal of Educational Research,* (pp. pp.213-216, Vol. 64,

R.M. Warren, H. a. (1968). *Perception: Its Physiology and Development,* New York

[7] Ritter SM, F. S. (2017). Happy creativity: Listening to happy music facilitates divergent thinking. . *PLoS ONE 12(9):* .

[8] Root-Bernstein, R. (2001). Music, Creativity and Scientific Thinking. *The MIT Press, Leonardo*, 34(1), 63-68

VII. APPENDICES

VII. 1. Appendix - A

Consent Form

You are being asked to participate in a research study conducted by Celesty Winifred, Jonathan John Biju and Ranjani Ramadoss, students from the Department of Psychology at Christ (Deemed to be University), Bangalore. The results of this survey will be used to fulfil the requirements of a research project. You were selected as a possible participant in this study because you are between the ages 18 and 21.

Purpose of the Study

The purpose of this paper is to find out the effect of background music on creative task performance. It is also to present how Malhari music differs from a piece of Mozart. This brings out the analytical understanding of how music works. We are interested in studying how the different elements of western and Indian classical music affect the creative work of young adults.

Procedures

If you decide to participate in this study, you will be expected to undergo an IQ test (SPM) and a verbal and non-verbal creativity test conducted in a controlled environment.

Potential Risks and discomforts

There are no foreseeable risks of participating in this research. You may be asked to assess yourself and make creative responses while listening to some background music. There will be no damage to your hearing. If you feel any perceived physical or psychological risk, you have the option of withdrawing your participation without any justifications.

Potential benefits to participants and/or to society

A better understanding of how different types of music affect creativity is likely to be useful for many people. Hence, positive scientific use of our findings could benefit all listeners in improving creative flow and productivity, and have implications in educational spheres. Art has also been proved to have a positive

impact on employee engagement and productivity. This research benefits organisations looking to enhance workplace environment to induce creativity and novelty.

C**onfidentiality**

Your responses to the interview questions could be made public, however, your identity would remain confidential and an alternate name would be ascribed to you by the researcher. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission.

Participation and withdrawal

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

If you have any questions or concerns about the research, please feel free to contact us through Ranjani Ramadoss (r.ranjani@arts.christuniversity.in)

Rights of research participants

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Participant Signature

VII. 2. Appendix - B

Survey

1. Name
2. Age
3. Sex:
4. Nationality:
5. School:
6. Email address:

7. Any music education received: Yes / No
8. If yes, duration of education:
9. Level of proficiency in music (self assessed/ external):
10. Do you listen to music everyday? Yes / No
11. Do you attach emotional significance to your music listening process? Yes / No
12. How creative would you consider yourself? (On a scale of 1-10):
13. How spontaneous would you consider yourself? (On a scale of 1-10):
14. (On a scale of 1-10) how much exposure would you say you have had to Indian classical music?:
15. (On a scale of 1-10) how much exposure would you say you have had to Western classical music?:
16. Do you prefer quiet environment while attempting a creative or non-creative task? Yes / No
17. Do you have the habit of listening to music while performing creative or non-creative tasks? Yes / No

VII. 3. Appendix - C

Ethical Approval Form

CHRIST
(DEEMED TO BE UNIVERSITY)
BANGALORE · INDIA

Centre for Research

CU: RCEC: APPROVAL: 12/18

17 December 2018

Ms Celesty Winifred,Mr Jonathan John,
Ms Ranjani Ramadoss
Reg Nos 1631504, 1631509, 1631516
Department of PERFORMING ARTS, THEATRE STUDIES AND MUSIC,
CHRIST (Deemed to be University), Bengaluru

Sub: Ethical Approval of the Study Titled "Effects of background music on creative task performance: Malhari vs Mozart".

The Institutional Ethics committee has reviewed your application for ethical clearance for the Study titled "Effects of background music on creative task performance: Malhari vs Mozart".

The committee has cleared your proposal for data collection after assessing the ethical aspects.

Sincerely,

T. S. Sam

Tony Sam George
(Member Secretary to Ethics Committee)
Additional Director
Center for Research
CHRIST (Deemed to be University), Bengaluru

Hosur Road, Bengaluru - 560 029, Karnataka, India. www.christuniversity.in
Tel: +91 80 4012 9600 Fax: +91 80 4012 9000 email: mail@christuniversity.in