The Measure of Music on Academic Performance

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Chapter 1: Introduction

This research project explores the effects of music on the academic performance of college students, with a specific focus on students at Winthrop University. The main objective of the study was to investigate whether listening to music has a positive or negative impact on students' ability to perform academically. By surveying a diverse group of students, our goal was to gain insights into how music influences focus, concentration, and overall academic success.

The research aims to address whether certain types of music or certain contexts (such as during study sessions or in a social setting) have a measurable impact on students' grades and productivity. Additionally, we sought to explore if there is a generational or personal preference within music genres that may influence the outcomes.

Our target audience for this research consists of Winthrop University students, a group representing a variety of academic disciplines, backgrounds, and musical preferences. This group provides an ideal setting to explore the role of music in academic environments, given the diverse academic pressures and social dynamics experienced by college students.

Through this study, we hope to provide valuable insights that could guide students in optimizing their study habits and creating an environment conducive to academic success.

Chapter 2: The Research Methodology

During our planning period, we created our research objectives, developed our research questions, and identified the variable we would measure, which was music. We decided to include questions based on student music preferences, study habits, and productivity to gain a clear understanding of our research topic. Our sample consisted of 93 students who were recruited through nonprobability sampling. The sample consisted of students in shared campus organizations, shared classes, and 1 on 1 contact.

We conducted primary quantitative research by creating a survey questionnaire. We used a descriptive research methodology since our goal was to define if one variable affects another (music effect on academic performance). Our introductory statements explained the central theme of our survey and research goal. When creating our questionnaire, we split our questions into two categories: general questions and demographic questions. During this process, we revisited our research objective. This gave us a guideline of which questions to include in the finalized questionnaire.

We only include questions that could contribute to our understanding research objective. Once we finished drafting our questions, we reviewed them to ensure they were easy to understand and free of error. All questions in the survey besides the demographic questions were close-ended. The survey consisted of 29 questions with a large portion of Likert scale questions. We worked a lot with categorical variables in our research with 72% ordinal data and 26% nominal data. This variable could be found in our demographic-related questions (age, gender, class) and scale questions. We were very successful at eliminating data errors. All our respondents fully completed the questionnaire, and we didn't have any missing data values. We carefully reviewed the questions to ensure there weren't any misleading questions that could have possibly caused data errors.

Chapter 3

Demographic information plays a crucial role in research as it provides essential context for understanding the perspectives and behaviors of different groups within a population. By collecting data on characteristics such as age, gender, academic level, and technology usage, researchers can identify patterns, make more accurate interpretations, and ensure that their findings are relevant to the appropriate audience. This information helps highlight trends, gaps, and potential biases in the data, allowing for a more comprehensive and meaningful analysis of the results.

We asked a few demographic questions including age, gender, academic level, and the devices each person uses. For age, we found that the majority of the people who completed the survey are between the ages of 17-22 years old which makes up about 85.1% of the people in our survey. 62.2% of the participants were female in our survey and 31.1% were male. There was 2.7% of the sample that was nonbinary/third gender, and 4.1% preferred not to specify their gender. 31.1% of participants were seniors, 23% were juniors, 13.5% were sophomores, and 21.6% were freshman. 10.8% of the participants were also graduate students. 5.4% of the participants use a phone or tablet for their school work, 16.2% of participants use a desktop computer, 73% of participants use a laptop. We unfortunately had 19 respondents that did not complete the survey so there is missing data.

Chapter 4

Independent Samples T-Test

Tested: Study_Per_Week by Create_Study_Playlists (1 = No, 2 = Yes)

- t = -0.07
- p = 0.95 (not significant)

  Conclusion: Whether or not a student creates playlists doesn't significantly affect how much they study.

2. Chi Square Test:

Tested: The two variables being tested were gender and if students believed music had a positive impact on academic performance

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.095[a]	3	.377
Likelihood Ratio	2.960	3	.398
Linear-by-Linear Association	2.948	1	.086
N of Valid Cases	74		

3. One-Way ANOVA

Tested: Study_Per_Week by Music_Volume_Study

- F = 1.01

- $p = 0.37$ (not significant)

  Conclusion: Study time does not differ significantly across different music volume levels.

Null and Research Hypotheses Below:

Chi-Square Test | Variables:

- H_0 (Null): There is a relationship between gender and the perception that music positively affects academic performance
- H_1 (Research): There is no relationship between gender and the perception that music positively affects academic performance

Independent Samples T-Test | Variables: Study_Per_Week by Create_Study_Playlists

- H_0 (Null): There is no difference in average study hours per week between students who create study playlists and those who do not.
- H_1 (Research): There is a difference in average study hours per week between students who create study playlists and those who do not.

One-Way ANOVA | Variables: *Study_Per_Week* by *Music_Volume_Study*

- H_0 (Null): The average number of study hours per week is equal across all music volume levels.
- H_1 (Research): The average number of study hours per week differs across at least one music volume level.

Correlation | Variables:

- H_0 (Null): There is no correlation between music and retention rates
- H_1 (Research): There is a significant correlation between music and retention rates

Simple Linear Regression | Variables:

- H_0 (Null): There is no relationship between music and retention rates
- H_1 (Research): There is a relationship between music and retention rates

Chapter 4

Data Analysis Reporting Format

Please use this format to report **your descriptive data analysis**. The examples given below are meant to illustrate how each column is to be filled.

No.	Question from Survey	Variable name (from your SPSS datafile)	Data type	Mean (if applicable)	Mode (percent of sample)	Interpretation of findings
1	How often do you study per week?	Study Per Week	Interval	3.07	3 (44.1%)	Majority of sample studies a couple days a week
2	How often do you listen to music while studying?	Listen to Music	Interval	3.71	4 (29%)	The majority of the sampled college students listen to music while studying
3.	Please indicate how often do you listen to the following types of music while studying - Jazz	listen to jazz	Interval	2.15	1 (38.7%)	Majority of sample never listen to jazz when studying
4	Please indicate how often do you listen to the following types of music while studying - Folk	Listen to folk	Interval	1.59	1 (55.9%)	Majority of the sample never listens to folk music
5	Please indicate how often do you listen to the following types of music while studying - Classical	listen to classical	Interval	1.77	1(51.6 %)	Majority of sample never listen to classical when studying
6	Please indicate how often do you listen to the following types of music while studying - Pop	Listen to pop	Interval	2.65	3(25.8%)	Majority of sample sometimes listen to pop
7	Please indicate how often do you listen to the following types of music while studying - Rap	Listen to rap	Interval	2.70	3 (25.8%)	Majority of sample sometimes listens to rap when studying
8	Please indicate how often do you listen to	Listen to instrumental	Interval	2.94	4 (25.8%)	Majority of sample frequently listens to instrument when studying

	the following types of music while studying - Instrumental					
9	Please indicate how often do you listen to the following types of music while studying - Hip Hop	Listen to Hip Hop	Interval	2.89	4 (28%)	The majority of the sample frequently listens to Hip hop when studying
10	Please indicate how often do you listen to the following types of music while studying - Rock	Listen to Rock	Interval	2.19	1 (33.3%)	The majority of the sample never listen to rock when studying
11	Please indicate how often do you listen to the following types of music while studying - Country	Listen to country	Interval	2.19	1 (34.4%)	The majority of the sample never listen to country when studying
12	Please indicate how often do you listen to the following types of music while studying - Other	Listen to other	Interval	2.18	n/a	
13	Please answer the following questions - Do you listen to music the entire time you study?	Music Entire Study	Categorical	3.62	3(21.5)	The majority of the sample sometimes listens to music the entire time when studying
14	Please answer the following questions - Does music negatively affect your concentration while studying?	Music Affect Concentration	Categorical	2.39	3 (25.8)	The majority of sample concentrations are negatively affected while studying
15	Please answer the following questions - Does music negatively affect your retention of academic material?	Music Affect Retention	Categorical	2.12	1 (28%)	Most students sampled , retention is not affected by music
16	Please answer the following questions - Do you feel more motivated to study long hours when you listen to music?	Music Increase Motivation	Categorical	3.79	4 (29%)	Most students feel more motivated when studying and listening to music
17	Please answer the following questions -	Prefer Studying Silence	Categorical	2.49	3 (29%)	The majority of the sample sometimes prefers Studying Silence

	Do you prefer studying in silence?					
18	Please answer the following questions - Do you prefer studying with background noise	Prefer_Studying_Noise	Categorical	3.32	3 (24.7%)	Majority of sample sometimes prefer studying w/ background noise
19	Do you notice a positive difference in your test performance when listening to music?	Music test performance	Categorical	n/a	2 (55.9%)	Most students notice a positive difference in testing when listening to music
20	What times do you generally study?	time study	Categorical	n/a	3 (41.9%)	Most students study at night
21	What is your learning style?	learning style	Categorical	n/a	1 (52%)	
22	What type of streaming service do you primarily prefer to use? - Selected Choice	stream service preference	Categorical	n/a	1 (97.8%)	Most students survey prefer spotify
23	What environment do you typically study in? - Selected Choice	Study environment	Categorical	n/a	2 (32%)	Most students study in dorm
24	What volume do you usually listen to music while Studying?	Volume	Categorical	n/a	2 (41.9%)	Most students study with medium volume
25	Do you create playlists specifically for studying?	Create playlist	Categorical	n/a	1 (52.7%)	Most students don’t have a playlist for studying
26	Do you use white noise or ambient sounds (Rain Sounds, Nature Sounds) while studying?	Noise Use	Categorical	n/a	1(44.1%)	Most students don’t study w/ ambient noise
27	What is your age?	Age	Categorical	n/a	1 (67.7)	Most students surveyed are between 17-22 y/o
28	What is your gender?	Gender	Categorical	n/a	2 (49.5%)	Most survey participants are female
29	What is your academic level?	Academic level	Categorical	n/a	4(31.1%)	Most participants are seniors

Please use this format to report **your inferential data analysis**. The examples given below are meant to illustrate how each column is to be filled.

No.	Research hypothesis / Research Question	Variable 1	Variable 2	Significance	Conclusion	Interpretation
	Chi Square test of independence					
1.	Is there a relationship between gender and the perception that music positively affects academic performance?	Gender	Music	Alpha = 0.189 (one tailed)	Null hypothesis is upheld	There is no relationship between gender and the perception that music positively affects academic performance
	Independent samples T test					
2	Is there a difference in average study hours per week between students who create study playlists and those who do not?	Study playlist usage	Average study hours per week	Alpha = 0.95 (two tailed)	Null hypothesis is upheld	Whether or not a student creates playlists doesn't significantly affect how much they study.
	One Way ANOVA					
3	Do study times vary across volume levels?	Study times	Volume levels	Alpha = 0.37	The null hypothesis is upheld	Study time does not determine volume level
	Correlations					
4	Does listening to music while studying positively connect to students' retention?	Music	concentration	Alpha = 0.226	The research hypothesis is upheld	The correlation is positive (0.226) and is significant at the 1% level
	Regression					
5	Is there a relationship between listening to music while studying and retention?	Music	Retention	Alpha = .226	The research hypothesis is upheld	Based on the regression, there is a relationship between students retention and listen to music while studying

Correlation

Correlations

		Please answer the following questions - Do you listen to music the entire time you study?	Please answer the following questions - Does music negatively affect your concentration while studying?	Please answer the following questions - Does music negatively affect your retention of academic material?
Please answer the following questions - Do you listen to music the entire time you study?	Pearson Correlation	1	-.373**	-.140
	Sig. (2-tailed)		<.001	.226
	N	76	76	76
Please answer the following questions - Does music negatively affect your concentration while studying?	Pearson Correlation	-.373**	1	.487**
	Sig. (2-tailed)	<.001		<.001
	N	76	76	76
Please answer the following questions - Does music negatively affect your retention of academic material?	Pearson Correlation	-.140	.487**	1
	Sig. (2-tailed)	.226	<.001	
	N	76	76	76

**. Correlation is significant at the 0.01 level (2-tailed).

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Please answer the following questions - Do you listen to music the entire time you study?[b]	.	Enter

a. Dependent Variable: Please answer the following questions - Does music negatively affect your retention of academic material?

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.140[a]	.020	.006	1.042

a. Predictors: (Constant), Please answer the following questions - Do you listen to music the entire time you study?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.615	1	1.615	1.488	.226[b]
	Residual	80.319	74	1.085		
	Total	81.934	75			

a. Dependent Variable: Please answer the following questions - Does music negatively affect your retention of academic material?

b. Predictors: (Constant), Please answer the following questions - Do you listen to music the entire time you study?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.549	.373		6.837	<.001
	Please answer the following questions - Do you listen to music the entire time you study?	-.119	.098	-.140	-1.220	.226

a. Dependent Variable: Please answer the following questions - Does music negatively affect your retention of academic material?

Chapter 5: Discussion, Integration, and Recommendations

Although we were able to achieve our research objective by understanding music's impact on students' academic performance, there were a few ways we could have improved. Our research question was broad. In order to get clear insight, we could have picked a specific area to focus on. For example, studying the effect music has on college students' concentration while completing assignments. This would make our results easier to measure.

Our research shows that music's effect on academic performance varies from student to student. A variable that could have aided in interpreting the results includes students' majors. As college students, our academic paths are different for each major. We study and execute our work in different ways. Because of this, it is important to know which majors participated in our survey. A music performance major experience/ reasoning listening to music while doing work will be drastically different from a chemistry major.

Another factor that could have been beneficial to our research is including questions regarding moods. Although we included questions regarding motivation and concentration, we could have added questions solely focused moods. For example, how relaxed does music make you feel when studying? 1- not relaxed 2-slightly relaxed 3- sometimes relaxed 4-frequently relaxed 5-Always relaxed. This could have replaced variables that had little correlation to music's effect on academic performance such as gender.

One of the most important changes we would have made is expanding our sample size and demographics. Our group was unable to reach the target number of one hundred respondents. Although we were only seven respondents short, this could have expanded our demographic. Most of our respondents fell under the same demographics. For example, majority of our respondents are female and seniors. Increasing our sample size could have played a part in diversifying our data.