

# How Music Affects Basketball Shooting

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## **Abstract**

The purpose of this study is to see how music affects basketball shooting. Previous research showed music improved team cohesion and could help a player enter a flow state and shoot better. We hypothesized that music would help the students shoot better, especially for music the players preferred. The participants in our study shot 10 free throws under four different conditions, they first shot without music then with music of their preference while shooting, then chill music, then finally hype music. We found that the shot quality was higher for the hype music condition. Also, people who preferred hype music shot better with their preferred hype songs compared to the control and chill conditions. The people who preferred chill music seemed to improve over time, not necessarily with the music they preferred. Our data suggests that hype music might be beneficial, but only for the people who prefer that type of music.

If music could help you focus while doing homework, how could it help with something competitive like basketball? Around 82% of teens listen to music often (1). Since so many teens listen to music we wonder if it would be helpful for them to listen to music while competing in sports, like basketball. In basketball, one of the most important elements of the game is shooting: it's how teams win. Athletes might listen to music because it can affect flow, team cohesion, and focus while shooting (2,3,4,5). This focus, called attentional control, is important because it helps the shooters focus on the right things at the right time (6). If music helps with shooting more teams/people should do it before playing. In this study we will have high school students shoot first with no music, second with the music of their choosing, third with chill music, then lastly hyper music and see if it affects their shooting accuracy and quality.

Music affects people in many ways during physical activity (5). First, is dissociation, which helps an athlete take their mind off the bad aspects of activity, such as running and getting tired (5). They won't think about how tired they are while running because of the music. So maybe when shooting, one won't think about the last shot they missed or how tired their arms are. The second thing is arousal regulation (5). Arousal regulation is when you get out into a mood, for example, if someone is about to play in a football game he or she might listen to hype music to get them hype for the game, or before a track meet someone may listen to calmer music to calm their nerves before the race. This is important because the music can get them in a rhythm/flow. This suggests listening to music while shooting baskets might get them into a flow where they can succeed (5).

What is flow and why is it important? Flow is the state, in which one is completely locked in. For example, if someone is playing video games and he or she has been playing for 2 hours but it feels like 20 minutes, or doing homework and completely locked into doing said homework. This is important because music can help someone get into a flow (2). Research suggests a flow state might improve shooting in basketball. Researchers had 30 college athletes shoot a variety of distances before and after an intervention. All groups, including a group that watched videos of professional shooters and a group that received help setting goals and meditating, entered a state of flow and saw their shooting accuracy increase (2). This is important because we are studying music, which could help someone get into a flow, and therefore we think shoot better, as researchers in this study found.

Focus in basketball is important while shooting, independent of music. Researchers had 10 basketball players shoot with an eye tracker (6). Experienced players use two things to shoot well: the quiet eye and suppression vision. Quiet eye refers to when a player looks at the hoop early and often, and then they suppress their vision or blink when shooting since the ball blocks their vision. They wanted to see what the players were looking at while they were shooting and the experimenters would try to manipulate the players' anxiety by distracting them and they would notice that some players would lose focus of the goal and start to shoot worse because they looked at the ball and did not suppress their vision. This is important to our project because what music could do is help the players focus more on the target and help them remember to suppress their vision. We won't be trying to distract them but they may distract themselves by looking over to the side subconsciously and the music could help them more.

Music can also affect cohesion in basketball teams (3). The researcher had 2 professional basketball teams fill out a team cohesion questionnaire, and then had both teams train, one team trained with music, and the other trained without music. They noticed the team that listened to music didn't necessarily play better but they had more team cohesion (3). This is important because the music helped them lock in and teams that work well together usually play better. So the music helps them with more cohesion which can help with better play overall. What remains to be seen is if they would actually shoot better.

Music has been found to affect basketball but does certain music help more than others? A researcher had basketball players train first without music, second with slow music, and lastly with fast-tempo music. The music was taken from a classical symphony. The researchers did not find any differences in performance. They only noticed it was harder for the players to calm down after the workout when they were playing fast-tempo music. Even though there wasn't a difference they used classical music which isn't the type of music usually used for sports so that could play a factor in why they didn't see a difference. This is important because in our experiment we will play calm music for a trial and hyper/faster music for a different trial to see if that makes a difference and we will play music that they like and are familiar with, and what is typically played before basketball games.

Overall research shows that music typically helps with basketball because it can help get the athlete into a flow and improve team cohesion(2, 3). This study contributes to our understanding of music by showing how it can affect basketball shooting performance. We had 8-10 students from TNA shoot 10 free throws without any music, and listen to music in headphones before and while they shoot. The first music trial had their own preference of music, the second trial had calm music from a playlist we made, the third music trial they listened to hype music. We hypothesized that music will help the students shoot better. They will shoot better with music because the music can help get them in a flow and flow can help shooters perform better (1). We also hypothesize that they will shoot better with their own preferred music because with their music they can get into a flow faster than if they get music that they really don't enjoy.

## **Materials and Methods**

A total of **10** high school students from The Neighborhood Academy participated in the study. All participants from the study were African American, composed of eight males and two females from grades 11 and 12 and between the ages of 16-18. All ten students listened to music every day and five play basketball 2-3 times a month. Also, six students prefer calm/chill music and the rest prefer hype/turn-up music.

The participants were given a survey so we would be able to tell how often they play basketball, how much they listen to music, and what type of music they prefer. The survey consisted of 6 questions related to music and basketball. For example, I asked if they prefer calm/chill music or hype/turn-up music. This is asked because I want to know their music preferences and see if their preferences help them shoot better.

For the experiment, they shot 10 free throws a total of four times. First, they shot the free throws with no music, then with their preferred music, then chill, and then hype. Music was

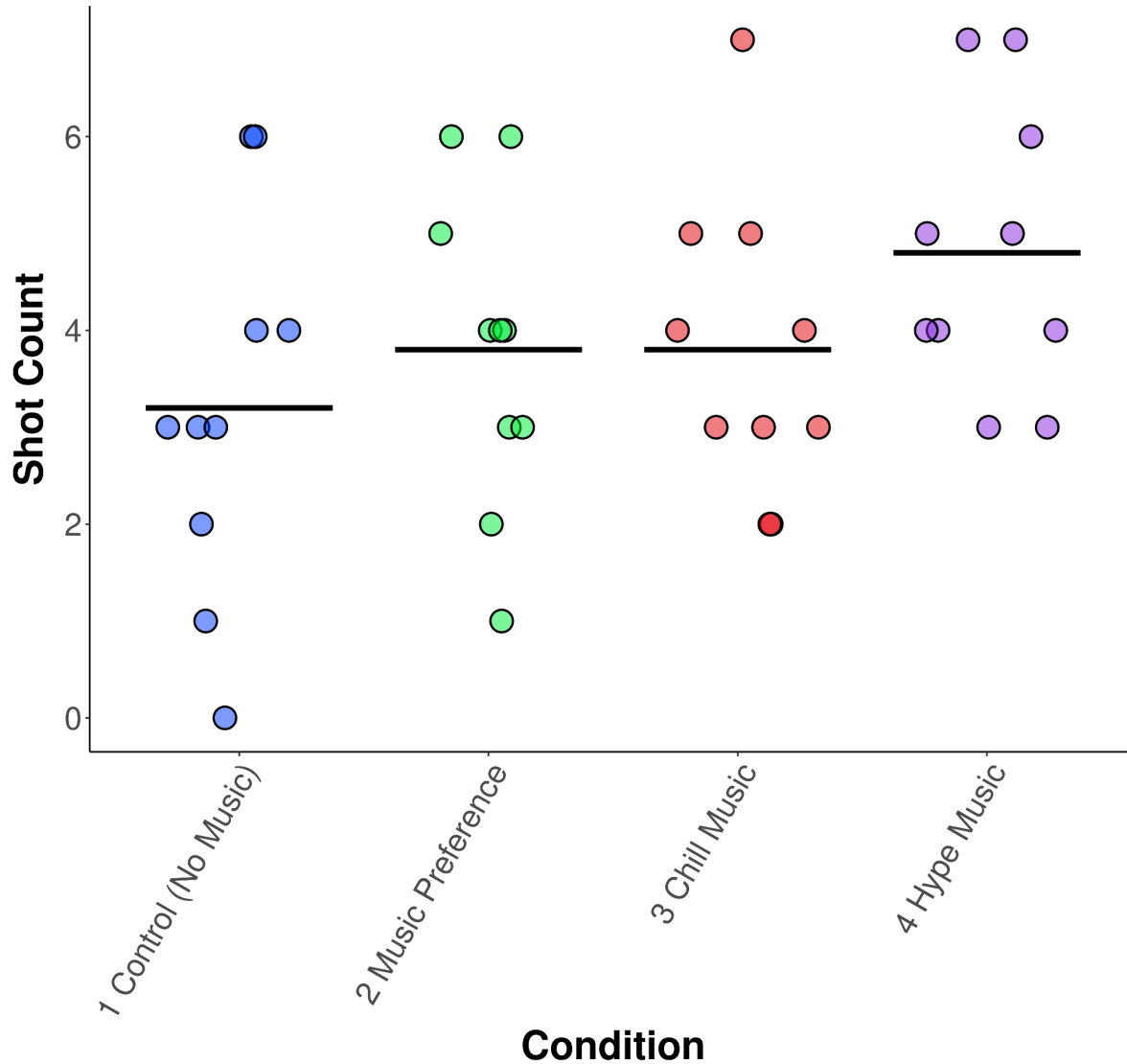
played through wireless Beats headphones. They were allowed 2-3 warm-up shots before they shot in each “phase”. Shots were scored as either a: total miss, bounce and miss, bounce and make, or a “swish”. These were given point values of 0,1,2, or 3 points. The experiment took place in small groups of 2-3 people and did the same “phase” one after another.

Differences in all four phases were analyzed using a one-way ANOVA test for correlated samples. Individual differences were found using a Tukey post-hoc test. The abbreviation M is the mean, and SD is the standard deviation. All tests were calculated using vassarstats.net with a 0.05 significant threshold.

## **Results**

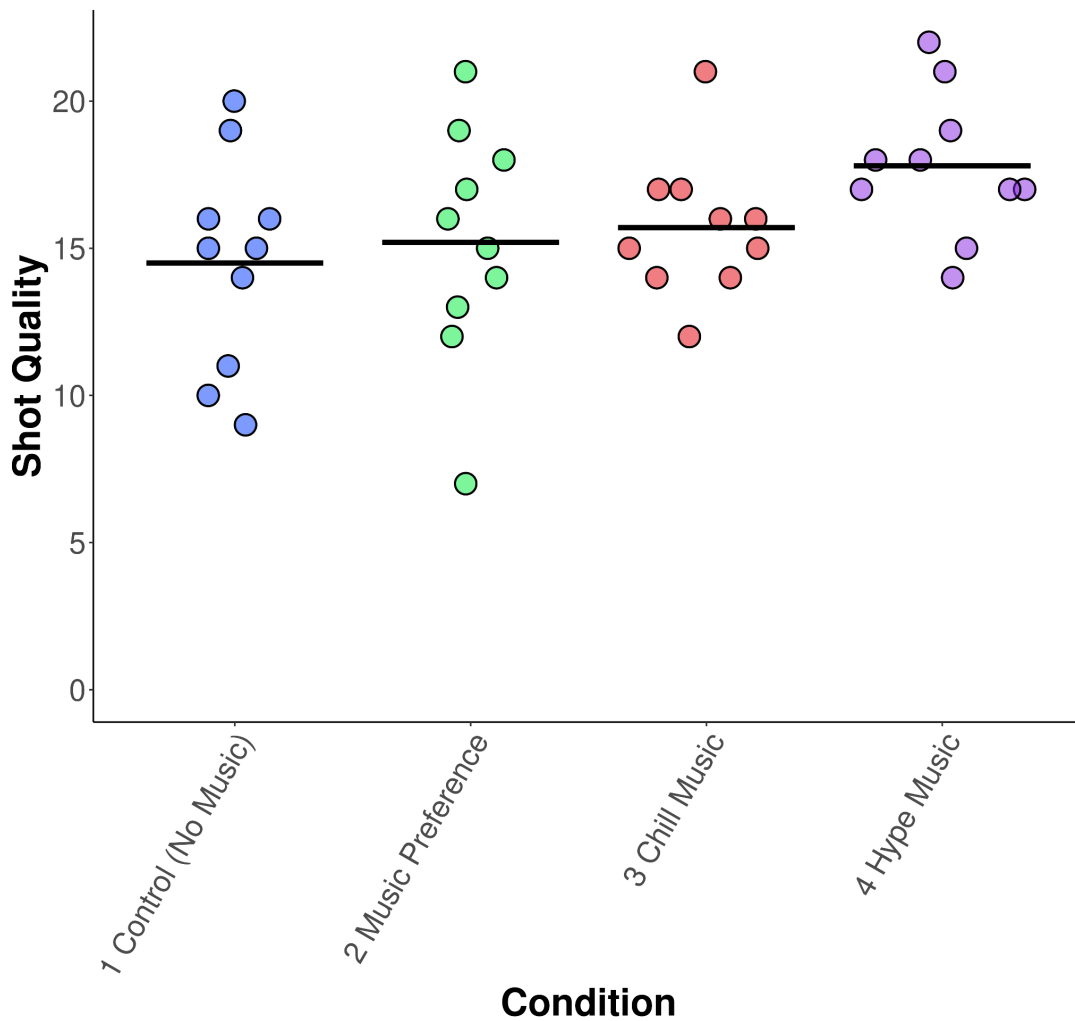
In this experiment, we tested to see if music correlated with basketball shooting. We had participants first shoot with no music then shoot with different types of music (chill, hype, preference) to see if there was a difference in their shooting. We expected them to shoot better with music and shoot the best with their preference.

Our first hypothesis was music would aid in performance and a person's preference would help the most. The first thing we analyzed was the amount of baskets made out of 10. A one-way ANOVA for correlated samples did not find a difference in total baskets made ( $F(3,27)=2.46, p=0.084$ ). Even though there wasn't a significant difference there was a pattern in our data. The hype music did the best with  $M=4.8$  baskets made ( $SD= 1.5$ ), chill ( $M=3.8, SD= 1.5$ ) and preferred music ( $M=3.8, SD= 1.6$ ) did the second best with 3.8 baskets made and no music did the worst with  $M=3.2$  baskets made ( $SD=1.9$ ).



**Figure 1. The music had no effect on the amount of shots made.** The dot plot shows the shots made and the standard error for all four experiment conditions, control (no music), music preference, chill music, and hype music (n=10). The shot count was based on the number of shots they made out of 10 (the lowest being 0 the max being 10). One-way ANOVA for correlated samples showed there was no significant difference.

The second thing we looked at was the quality of the shots. We did a complete miss with 0 points, a missed but hit rim was 1 point, a make and hit rim was 2 points, and a “swish” was 3 points. This results in a maximum score of 30 points and a minimum of 0 points. A one-way ANOVA test did find a difference in the quality of the shot. ( $F(3,27)=3.07, p=0.045$ ). A Tukey HSD post hoc test found a difference between the control condition ( $M=14.5, SD= 3.6$ ) and the hype music condition ( $M= 17.8, SD= 2.4$ ). The preference ( $M= 15.2, SD= 4.0$ ) and chill ( $M= 15.7, S = 2.4$ ) conditions did not have a difference. They both were improvements from the control but not enough to make a significant difference.



**Figure 2. Basketball shot quality is higher for hype music conditions compared to control.** Dot plot showing the mean of shot quality and standard error for all four experimental conditions control(no music), each athlete's music preference, chill music preference, chill music, and hype music ( $n=10$ ). Shot quality is derived from a point system where higher points mean better quality attempts (the min score being 0 the max score being 30). One-way ANOVA test for correlated samples with Tukey post-hoc test,  $p<0.05$ .

We saw that the hype condition did better but we wanted to know if that was because of the music or if people are getting better over time because the hype was the last one and they all shot during 1 period of time. The pattern in the overall shot count and shot quality is summarized in Table 1.

<b>Count</b>	Control (1)	Preferred Music (2)	Chill (3)	Hype (4)
Prefer Chill	2.8	3.5	4.16	5.5
Prefer Hype	3.75	4.25	3.25	3.75
<b>Quality</b>	Control (1)	Preferred Music (2)	Chill (3)	Hype (4)
Prefer Chill	13.8	14	16	19.1
Prefer Hype	15.5	17	15.5	15.75

**Table 1. The count and quality of the shots everyone took.**

The above table shows the shots made by people and the music they prefer. The people who prefer chill seem to get better over time going from an average of 2.8 to 5.5 shots made and 13.8 and 19.1 shot quality and the people who prefer hype shots consistently throughout the whole thing shoot best with the music they prefer and the hype. I took the averages of the people who prefer chill and the people who prefer hype to see if hype music was the factor and not people getting better over time. This shows that those who preferred hype music were consistent and those preferring chill shots better over time.

The people who preferred hype music shot consistently throughout the tests and seemed to shoot better with their preferred hype songs and the hype music compared to the control and chill. The people who preferred chill music seemed to improve over time, not necessarily with the music they preferred. This suggests that hype music might be beneficial, but only for the people who prefer that type of music.

## **Discussion**

In this study, we determined if music helps people while shooting. In our first hypotheses we said they will shoot better with music. This was partially supported because the numbers we got show the people shot best with the hype music which was the last phase. We found a difference but not a significant difference in the number of shots (Figure 1) made but the amount of points they scored overall was higher (Figure 2). Our second hypothesis was they were going to shoot better with the music they preferred because they could get into a flow more easily. But we found they actually shot the best with hype music and not their preference. But this was especially true for people who prefer hype music (Table 1).



Our results were partially consistent with the knowledge of flow (1). Prior researchers found flow helps people shoot better. We found that people who prefer hype music shoot better with hype music. We did not test their flow, but we think that hype music helped them get into a flow helping them shoot better. We think this because hype music is typically the music that is played at sporting events and it helps people get locked in and perform. Since people expect this music, it seems reasonable it helped them “lock in”.

Our results were also partially consistent with the knowledge of team cohesion (2) They found that the team that listened to music didn't necessarily play better but they had more team cohesion. We found that they didn't necessarily shoot better as in making more shots but they scored more points showing they were getting closer to making the shot or making more swishes. While we did not test any team cohesion we can see that they didn't make more shots but they made better shots. This could potentially affect team cohesion, as teammates could feed off this positive energy of better shots and make better shots themselves.

The major limitation of my experiment would be the fact they all shot their free throws in one session. Since they were shooting so much it's hard to tell if they were getting better over time or they were getting better because of the different types of music. But I had to do it this way because it would be hard to take so many people 4 different times and take that many class periods off. But overall that's all I could have done because I couldn't take them from so many classes with the amount of time I had to get it done.

A way I can improve on or make a difference is to have them shoot in 2 different sessions instead of one. In 1 session they put up 40 shots and in their last set of shots they have already put up 30 shots. That's a lot of shots and they could warm up from it. If I do 2 sessions it would be 20 shots a session so when they shoot their last shots of the session they will only have put up 10 shots so they don't warm up as much as they did during my experiment. So then I could get a better gauge of the shots made and I could see if they got better because of the music or if they got better the more they shot.

According to our research music doesn't necessarily help players make more shots but it may help them make better shots. However, the effect was only found for hype music. For the people who prefer chill music, we can't say if the music is what did it because it seemed like they shot better over time. But the people who preferred hype music shot the best with their preferred music and the hype. So if an athlete likes hype music, they should try listening to hype music before a game or shootaround 👍.

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