EFFECTS OF MUSIC ON PHYSICAL ACTIVITY RATES OF MIDDLE SCHOOL PHYSICAL EDUCATION STUDENTS

Approved: ___Dale Henze_____ Date: __03/09/2017_____

EFFECTS OF MUSIC ON PHYSICAL ACTIVITY RATES OF MIDDLE SCHOOL PHYSICAL EDUCATION STUDENTS

A Seminar Paper

Presented to

The Graduate Faculty

University of Wisconsin-Platteville

In Partial Fulfillment of the

Requirement for the Degree

Masters of Science

in

Education

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by

Taylor Reynolds

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Abstract

EFFECTS OF MUSIC ON PHYSICAL ACTIVITY RATES OF MIDDLE SCHOOL PHYSICAL EDUCATION STUDENTS

Taylor Reynolds

Under the Supervision of Joan E. Riedle, Ph.D.

Few studies have investigated the effects of music on physical activity rates of middle school students. Therefore, this study examined the effects of music on the physical activity rates (number of steps taken in a 10-minute session of running) on 18 6th grade students (4 male, 14 female) and 23 8th grade students (12 male, 11 female) over a five week period. All participants were Lancaster, WI, middle school students between the ages of 11 and 14; 40 students were Caucasian and one was African-American. Students ran twice a week for 10 minutes during their regularly scheduled gym class. Each week the students ran one session with no music being played, and the other session with music being played. Results showed that students had a significantly higher physical activity rate while music was being played as opposed to no music being played. This effect persisted throughout the five-week study. The result of this study could positively impact educators, coaches, fitness instructors, parents, and others in the general public.

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CHAPTER I

INTRODUCTION

My research focused on the effects of music on the physical activity rates of middle school physical education (PE) students.

Ward and Dunaway (1995) explored the use of contingent music during high school physical education class and its effect on the number of laps students ran each minute. Music was played continuously and laps per minute were recorded as baseline data. Next, the teacher would turn off the music if students were running too slow (slower than their baseline test). This increased the number of laps students ran each minute. Finally, to verify that music was causing the effects on students running, the study reversed the music contingency. The teacher would turn off the music if the students ran too fast (faster than their baseline test). This method slowed down the students running decreasing their laps per minute, and also confirmed that the contingent music was the factor responsible for the changes in number of laps run each minute. Ward and Dunaway demonstrated that playing music, in the correct way, can positively impact the number of laps the students ran each minute. Can music played consistently throughout a PE lesson, rather than contingently, create high levels of physical activity compared to lessons with no music? Can other factors such as heart rate monitors or pedometers increase physical activity?

Barney and Prusak (2015) explored the effects of playing music during an elementary physical education class and how it impacted students' physical activity. Students in grades 3 to 5 tracked their physical activity using pedometers while engaging in walking and Frisbee lessons. The students recorded their physical activity with and without music. The pedometers tracked the number of steps taken by each student. Using music during PE lessons had a positive

effect on physical activity. Regardless of the type of activity, students listening to music recorded higher levels of physical activity as opposed to no music. Music had a stronger relationship with the more intense activity of Frisbee and had a lesser effect on the low intensity activity of walking. Barney and Prusak conducted their research in less than a week. Would the increased physical activity persist or habituate if continued for weeks or months? Would the same effect be found on middle school students?

My research built upon Ward and Dunaway (1995) and Barney and Prusak (2015) by using music paired with pedometers in physical education class, to explore its effects on physical activity for middle school students at Lancaster, WI, over six weeks.

Statement of the Problem

I hypothesized that playing music will increase the level of physical activity (by increasing the number of steps taken during class) among middle school physical education students. I predicted that music will persist in increasing physical activity throughout the six week study.

Definition of Terms

Pedometer: An instrument usually in watch form that records the distance a person covers on foot by responding to the body motion at each step (Merriam-Webster, n.d.).

Heart rate monitor: A wearable device that allows a user to measure his/her heart rate in real time, usually consisting of a chest strap transmitter and a wrist receiver (YourDictionary, n.d.).

Delimitations and Limitations of the Research

There were two prominent delimitations to music and physical activity research at Lancaster Middle School. First, all participants in this study were from the same geographical location of rural Southwest Wisconsin. I chose these participants because this is where I teach. It cannot be assured that the results found would be the same if the research was conducted in

other geographical locations. Secondly, the songs and type of music played may not have been liked by all students. I chose songs that are up-tempo and well-known. However, different people enjoy different music. The type of music played could influence results.

There were also limitations to music and physical activity research at Lancaster Middle School. I have no control over the students' lives outside of class. Their quality of sleep, calorie intake, stress, and home lives vary daily. These factors may have influenced the physical activity levels of students in class.

Method of Approach

I collected data using pedometers in physical education class. Students ran for 10 minutes at the start of each PE class. The pedometers recorded the number of steps each student took. The number of steps recorded while running in class determined physical activity levels. The students ran with music every other lesson. Each lesson the students recorded the number of steps taken. The number of steps taken while music was played in a PE lesson was compared to the number of steps taken with no music played in a PE lesson to examine the relationship that music has on physical activity. The IRB approval letter is attached as Appendix A. Project data collection materials are attached as Appendix B.

CHAPTER II: REVIEW OF THE LITERATURE

Research Question

My research focused on the effects of music on the physical activity rates of middle school physical education (PE) students.

Discussion of Prior Research

Clapham, Sullivan, and Ciccomascolo (2015) explored the effects that supportive curriculum combined with either heart rate monitors or pedometers had on fourth and fifth grade students' physical activity. The researchers created three groups of students in order to examine heart rate. One group wore the heart rate monitors and received supportive curriculum, a second group wore the monitors but received no supportive curriculum, and the final group received the supportive curriculum but did not wear heart rate monitors. The researchers created two groups who used pedometers. Both groups wore pedometers, however, only one group received the supportive curriculum; the other group did not. Students used their heart rate monitors and pedometers to track and record their steps per minute and their heartbeats per minute. Clapham et al. found that an effective physical educator is able to achieve positive levels of physical activity during PE classes. The use of heart rate monitors and pedometers along with the supportive curriculum had a more positive effect on fourth and fifth grade students' physical activity than either equipment alone or supportive curriculum alone. The use of technological devices such as heart rate monitors and pedometers are excellent ways to objectively measure physical activity in PE class. Clapham et al. documented that heart rate monitors and pedometers alone can increase physical activity among fourth and fifth grade students; even more physical activity exists when supportive curriculum is also received. The use of

pedometers and/or heart rate monitors can provide a baseline for physical activity as well as show growth or regression. These tools are accurate and objective, making them excellent tools for researching physical activity rates.

Deutsch and Hetland (2012) examined the perceptions and performances of fourth and fifth grade students upon completing the PACER (Progressive Aerobic Cardiovascular Endurance Run) test in elementary physical education class. For this study students ran the pacer test under 1 of 3 conditions. The first condition was running the PACER with high tempo back ground music. The second condition was running the PACER with mild tempo back ground music. Finally the third condition was running the PACER test with no background music. After the PACER test, students completed surveys regarding their effort, performance, motivation, and attitude during the PACER test. The results indicated that students who listened to one of the two music conditions while running the PACER test had a better attitude than the students who did not listen to any music while running the PACER test. Furthermore, the study showed students who listened to one of the two music conditions performed better and had a higher score on the PACER test than the students who did not listen to music. Additionally, the researchers discovered that female students performed better under the first music condition (high tempo), and male students performed better under the second music condition (mild tempo). Deutsch and Hetland provide valuable insight to music and its effect on the PACER test for elementary aged students. Would music provide the same results if performed on middle school students? Would it increase middle school PACER test scores? Would middle school students have similar survey results as elementary aged students? Deutsch and Hetland only looked at 4^{th} and 5^{th} grade students; no research was conducted using middle school students.

Partridge, King, and Bian (2011) examined the perceptions of high school students who used heart rate monitors in physical education class. Partridge et al. collected data through interviews with four focus groups which totaled 48 students from grades 9 to 12. The researchers offered positive conclusions about and potential warnings regarding using heart rate monitors in physical education class. The use of heart rate monitors is good as they motivate some students to try harder and reach higher levels of fitness. Some students enjoy tracking their heart rates. The monitors serve as a way to connect and engage PE students to their exercise, thus helping students who normally felt disconnected in PE class. Heart rate monitors serve as an objective form of assessment for physical educators. However, in their study changes in heart rate were linked to grades. Therefore, many students disliked using the monitors and associated them with bad grades or consequences. Partridge et al. recommend that educators use the monitors in a consistent and positive way to promote individual improvement. The use of technological devices is a great way to objectively measure physical activity; however, they should not be associated with grades while research is being conducted. Also, Partridge et al. did not research how middle school students felt about using heart rate monitors, and did not explore the perception of using pedometers.

Dryer and Mckune (2013) researched the effects of music tempo on well-trained adult male cyclists. The participants cycled at high workloads for 20km under the following four conditions: fast tempo music played, medium tempo music played, slow tempo music played, and no music played. Dryer and Mckune found that fast tempo music caused an increase in total mood disturbance and tension compared to medium tempo and no music. Dryer and Mckune also found no physiological performance advantage to playing music. Dryer and Mckune give insight

into music's effects on well-trained adult male cyclists; however, their research was never attempted on other groups of people including middle school students.

Ward and Dunaway (1995) explored the use of contingent music during high school physical education class and its effect on the number of laps students ran each minute. Music was played continuously and laps per minute were recorded as baseline data. Next, the teacher would turn off the music if students were running too slow (slower than their baseline test). This increased the number of laps students ran each minute. Finally, to verify that music was causing the effects on student running, the study reversed the music contingency. The teacher would turn off the music if the students ran too fast (faster than their baseline test). This method slowed down the students running decreasing their laps per minute, and also confirmed that the contingent music was the factor responsible for the changes in number of laps run each minute. Ward and Dunaway demonstrated that playing music, in the correct way, could positively impact the number of laps the students ran each minute. Their findings did not uncover if music played throughout an entire physical education lesson would increase physical activity; furthermore, Ward and Dunaway only studied high school students.

Barney and Prusak (2015) explored the effects of playing music during an elementary physical education class and how it impacted students' physical activity. Students in grades 3 to 5 tracked their physical activity using pedometers while engaging in walking and Frisbee lessons. The students recorded their physical activity with and without music. The pedometers tracked the number of steps taken by each student. Using music during PE lessons had a positive effect on physical activity. Regardless of the type of activity, students listening to music recorded higher levels of physical activity with music as opposed to no music. Music had a stronger relationship with the more intense activity of Frisbee and had a lesser effect on the low

intensity activity of walking. Barney and Prusak failed to explore how music would impact middle school students. Additionally, Barney and Prusak did not discover how music would affect physical activity over an extended period of time. Would this effect persist or habituate if continued for weeks or months?

Summary

A relationship exists between music and physical activity. Research shows that music's effect on physical activity may vary depending on age, fitness level, and intensity of exercise. Music's influence on middle school-aged students is not well-known or researched. Would middle school students increase or decrease their physical activity if music is played? There is a need to explore music's effects on middle school students.

Hypotheses

I hypothesized that playing music would increase the level of physical activity (by increasing the number of steps taken during class) among middle school physical education students. I predicted that the increase in physical activity would persist throughout the six-week study.

CHAPTER III: METHOD

Participants

Research was conducted at Lancaster Middle School, which is in rural Southwest Wisconsin where the student body is 99% Caucasian. Student participants were enrolled in regular physical education class at Lancaster Middle School. Participants in the data set included 16 boys and 25 girls in grades 6th and 8th. The average age of the student participants was 13.

There were several instances in which students had over double their average number of steps during one of their running sessions. Because the student most likely forgot to reset their pedometer before running, that number was eliminated from the data set and replaced with the average number of steps that they had run during the other sessions under the same music condition. For example, if B2 had double the number of steps that he or she normally took during a session of running when no music was being played, that extremely high number was replaced with the average number of steps taken by B2 from the other sessions when no music was being played. The same method was used if a student was absent from class and did not run. If a student missed two or more running sessions under the same music condition his/her data were eliminated from the data set. For maximal accuracy, six students were removed from the data set during this study.

Materials/ Procedures

I collected data using pedometers in physical education (PE) class. Students ran for 10 minutes at the start of each PE class. The pedometers recorded the number of steps each student took. The number of steps recorded while running in class determined physical activity levels. The students ran with music playing every other class. The music was up-tempo, school

appropriate music that was played at a moderate level. The volume of the music was controlled by the teacher. Each class the students recorded the number of steps taken. The number of steps taken while music was played in a PE lesson was compared to the number of steps taken with no music played in a PE lesson to examine the relationship that music had on physical activity.

The duration of the study was originally designed to be six weeks. This was changed to five weeks for two reasons. First, after the 5th week of the research, Lancaster Schools had one week off for spring break and then students returned to school and completed the 6th week of the study. After students had been away from their normal school routines for a week there was concern that other factors such as travel, inactivity, and changes in daily habits and routines could influence week 6 results. Secondly, on one of the week 6 runs, the stopwatch encountered an error causing concern that the students may not have run 10 minutes exactly. For these two reasons, week 6 was dropped from the data.

CHAPTER IV: RESULTS

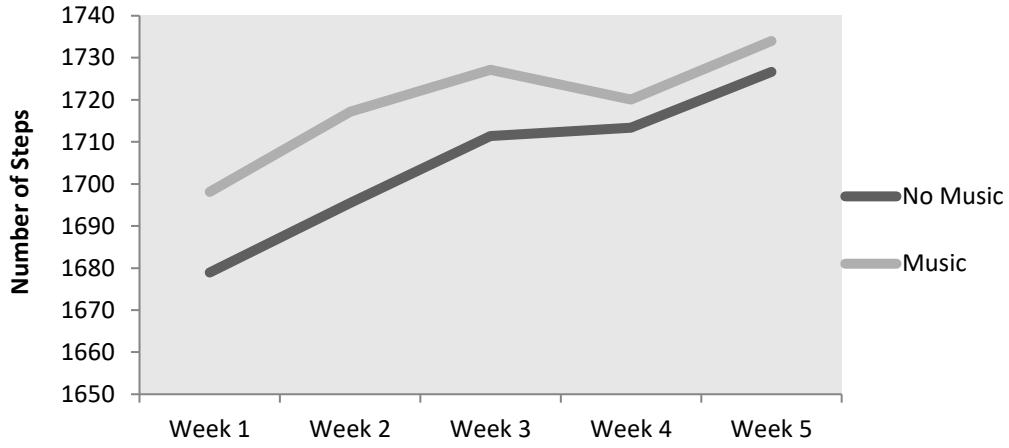
Data were analyzed by conducting a repeated measures analysis of variance. Music condition (no music or music) and weeks (1-5) were the independent variables and number of steps run per 10-minute session was the dependent variable. Both main effects were significant. The main effect of music condition was significant, $F(1, 40) = 6.29$, $p = .02$, $\eta^2_{partial} = .14$. In the no music condition students averaged 14 fewer steps per 10-minute session than when in the music condition. See Table 1 for the relevant means. The main effect of weeks was also significant, $F(4, 160) = 4.66$, $p = .001$, $\eta^2_{partial} = .10$. Students showed an improvement in the number of steps run each week regardless if music was or was not present.

Table 1. *Average Number of Steps Run by Music Condition and by Weeks*

	Mean	Standard Error
Music Condition		
No Music	1705.17	17.15
Music	1719.30	15.98
Weeks		
1	1688.53	18.53
2	1706.33	17.89
3	1719.24	16.85
4	1716.74	16.85
5	1730.32	17.79

The interaction of music condition and weeks was not significant, $F(4, 160) = 0.28$, $p = .89$, $\eta^2_{partial} = .007$. See Figure 1. The benefits of music persisted throughout the five weeks.

Figure 1: Comparison of Number of Steps Run with and without Music



CHAPTER V: DISCUSSION

The hypothesis stated that playing music would increase the level of physical activity (by increasing the number of steps taken during class) among middle school physical education students. I predicted that the increase in physical activity would persist throughout the five-week study. My research findings were consistent with these hypotheses. Data show us three main outcomes of this study. The first finding was that the music condition was significant in improving physical activity rates among the middle school students in this study. The data showed a higher level of physical activity when music was played during 10 minutes of running in gym class as compared to no music being played. Students averaged 14 more steps per 10 minute session when music was being played. The second analysis, comparing the 5 different weeks to each other, was also significant. The data shows that the students displayed a pattern of increasing the number of steps they ran each week both while music was being played and when music was not being played. I speculate this is due to their physical fitness improving with each week. The final analysis examined the interaction of the music condition and weeks. The findings were not significant. This insignificant correlation verifies that the benefits of music persisted across the five-weeks of the study. In weeks 4 and 5 the number of steps run when music was being played and the number of steps run when no music was being played did become slightly closer; however, the number of steps run when music was played continued to be higher. Further long term studies would be necessary to determine if the effects of music on physical activity rates would persist beyond 5 weeks.

The data found from this study are consistent with the results of Ward and Dunaway (1995) who explored the use of contingent music during high school physical education class and its effect on the number of laps students ran each minute. Ward and Dunaway demonstrated that

music, when used appropriately, could positively impact the number of laps the students ran each minute. The data are also consistent with Barney and Prusak (2015) who showed using music during physical education lessons had a positive effect on physical activity among elementary-aged students. Regardless of the type of activity, students listening to music recorded higher levels of physical activity with music as opposed to no music.

The data and information gained from this study are both important and meaningful in several ways. In a society that struggles with inactivity and obesity, learning that something as simple as listening to music can positively impact physical activity rates is very exciting. The information from this study could directly impact the thoughts, strategies, and pedagogy of teachers and educators, especially physical education instructors. Teachers could play music as part of class during activity time and potentially achieve higher rates of physical activity. The findings from this study could influence the instructional strategies of parents, coaches, and leaders of youth activities, specifically those looking to become or stay physically active. For example, a coach or even a parent who wants his or her child to be more active could simply turn on music as a method to boost physical activity rates. I speculate that music could increase physical activity rates of people of any age. This knowledge could be applicable to fitness instructors, personal trainers, or adults in the general population. Listening to music when lifting weights, walking, running, or biking are simple examples of activities that could achieve increased physical activity rates by listening to music.

The data from this study and the questions it brings to light pave the way for additional studies. How might music affect athletic practice and performance among athletes of different ages and abilities? How could music play a role in increasing physical activity rates for adults exercising at home and in gym/fitness centers? The data from this study showed music increased

physical activity rates throughout the five-week study. Would music continue to increase physical activity rates if the study continued for several months? Further research is needed to determine if music would benefit physical activity rates in long term durations over 5 weeks. Would music still benefit physical activity if tested for 6 months or 1 year? Additional studies could explore music's effects on physical activity rates with different aged students and even adults. Furthermore, they could examine music's effects between male and female genders. More research is needed to explore music's effects on sports training and athletic performance. Supplementary research could dive into music's effects on perceived effort, attitude, and enjoyment during exercise.

There are limitations to this study. Students could have purposely or inadvertently skewed their pedometer numbers. Students could have potentially shaken the pedometer when the teacher wasn't looking. They may have been taking an extra few steps with the pedometer on immediately before or after the 10 minute running session. The pedometers may have been dropped or jostled adding extra steps. Extra steps caused by these methods would be minimal as students were being supervised, but still need to be addressed as a potential weakness to the study. Lastly, students who had to stop or slow down due to a certain condition or reason could have potentially influence the data. Factors such as shoes becoming untied, pain or injury prior to running, stress, and attitude could all cause potential variations in the number of steps run for that session. The five-week duration of the study strives to diminish the effect of these factors on the data.

CHAPTER VI: REFERENCES

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APPENDIX A: IRB APPROVAL LETTER

UNIVERSITY OF WISCONSIN PLATTEVILLE
INSTITUTIONAL REVIEW BOARD

11/25/2015

Taylor Reynolds
Sponsor: Dr. Joan E. Riedle
Department of Masters of Science - Education
University of Wisconsin-Platteville

RE: IRB Protocol #2015-16-06

Project Title: Effects of Music on Physical Activity Rates of Middle School Physical Education Students

Approval Date: 11/25/2015
Expiration Date: 11/24/2016

Your project has been approved by the University of Wisconsin-Platteville IRB via a Full Board Review. This approval is subject to the following conditions, otherwise approval may be suspended:

1. No participants may be involved in the study prior to the IRB approval date listed above or after the expiration date.
2. All unanticipated or serious adverse events must be reported to the IRB.
3. All modifications to procedures, participant selection, and instruments used (surveys, consent forms, etc) must be reported to the IRB chair prior to their use. Extensive modifications may require full board approval.
4. If the project will continue beyond the expiration date, then the researcher must file for a continuation with the IRB at least 14 days prior to the expiration date. If the IRB approval for this project expires before approval for continuation is given, then a new protocol must be filled out and submitted. Federal guidelines allow for no exceptions to this rule. Any data collected after the expiration date cannot be used in the study.

If you have any questions, please contact the IRB chair at the address below. Include your protocol # on all correspondence.

Sincerely,

Dr Barb Barnet

Dr. Barb Barnet
Institutional Review Board Chair
Professor, Mathematics Department
Gardner 451
University of Wisconsin-Platteville
(608) 342-1942
barnetb@uwplatt.edu

1 University Plaza | Platteville WI 53818-3099 | www.uwplatt.edu

APPENDIX B: PROJECT MATERIALS

Data Code Sheet

Student Name	Code#	Student Name	Code#
	A1		**B1**
	A2		**B2**
	A3		**B3**
	A4		**B4**
	A5		**B5**
	A6		**B6**
	A7		**B7**
	A8		**B8**
	A9		**B9**
	A10		**B10**
	A11		**B11**
	A12		**B12**
	A13		**B13**
	A14		**B14**
	A15		**B15**
	A16		**B16**
	A17		**B17**
	A18		**B18**
	A19		**B19**
	A20		**B20**

Lancaster Community Schools

Lancaster, WI

July 15, 2015

To whom it may concern:

I give consent for Taylor Reynolds to conduct his research project on the effects of music on physical activity rates of middle school physical education students at Lancaster Middle School during the 2015-2016 school year.

I look forward to being able to use this data to benefit the learning of our students at Lancaster Middle School and impact student success in a positive way.

Sincerely,

Mark Uppena, Principal
Lancater Middle School
802 E. Elm St.
Lancaster, WI 53813
Phone: 608-723-6425
Fax: 608-723-6731

PARENT/GUARDIAN CONSENT FORM FOR PARTICIPATION OF HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF WISCONSIN-PLATTEVILLE & LANCASTER MIDDLE SCHOOL

1. Purpose: The purpose of this research is to examine the effects that music has on physical activity rates of middle school physical education students at Lancaster Middle School.

2. Procedure. Students who are enrolled in their regular physical education class at Lancaster Middle School for the 2015-2016 school year will have no additional responsibilities beyond participating in class. Your child's activity rates will be tracked via pedometers in class. Your child's activity rates will be included in my data set; the data set will not include your child's identifying information.

3. Time Required: Participation is expected to occur for six weeks throughout the 2015-2016 school year.

4. Risks: No short-term or long-term risks are foreseen. The only "cost" to the participants will be the time and effort required to participate in regular physical education class.

Benefits: Your child's participation in this study will help physical education teachers gain information that will help to better educate your child in physical education class.

5. Your Rights as the Parent of a Student Participant: The information gathered in this study will be confidential. Any data or results that are released from this study will not in any way identify you or your child. If your child would like to withdraw from the study at any point he/she may do so with no penalty or repercussions, and the data collected up to that point would be deleted. Upon completion of the study, results will be shared with you through a memo. If you have any further questions, please ask.

Taylor Reynolds, Graduate Student in Education, University of Wisconsin-Platteville
Health & PE Teacher, Lancaster Middle School
608-723-6425ext.232
reynoldst@lancastersd.k12.wi.us
Faculty Sponsor: Dr. Joan Riedle (riedlej@uwplatt.edu)

Once the study is completed, you may request a summary of the results by contacting me, Taylor Reynolds, or Mark Uppena, Principal.

6. If you have any questions about your child's treatment as a participant in this study, please call or write:

Barb Barnet Chair of the UW-Platteville IRB (608) 342-1942 barnetb@uwplatt.edu	or	Mark Uppena Principal, Lancaster MS/HS 608-723-6425 uppenam@lancastersd.k12.wi.us

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I have read the above information and (check one):

____ DO give consent for my child to participate in the research.

____ DO NOT give consent for my child to participate in the research.

Please print your child's name (First, Middle, Last):_____

Please print your full name (First, Middle, Last): _____

Please sign: _____ Date: _____

Then return this completed form to _____ by _____

STUDENT ASSENT FORM FOR PARTICIPATION IN RESEARCH
UNIVERSITY OF WISCONSIN-PLATTEVILLE &
LANCSTER MIDDLE SCHOOL

Dear Student,

We want to provide the best education possible to you and to future students. Therefore, we are conducting this research project. You are invited to participate in our physical education study. The purpose of this study is to find methods to help strengthen the benefits and learning that you receive in physical education class. You are being asked to participate in this study because you are a student in physical education class at Lancaster Middle School.

Whether you choose to participate in this study or not will have no impact on your grades. The information gathered will be used to help make Lancaster Middle School a better and stronger institution of learning.

Your parents have already given permission for you to participate in our research project and we are hoping that you will agree to participate. Your voluntary participation constitutes your agreement (assent) to participate. Thank you for helping us to better help you.

Sincerely,
Taylor Reynolds, Graduate Student in Education, University of Wisconsin-Platteville
Health & PE Teacher, Lancaster Middle School
608-723-6425ext.232
reynoldst@lancastersd.k12.wi.us
Faculty Sponsor: Dr. Joan Riedle (riedlej@uwplatt.edu)

Mark Uppena
Principal, Lancaster MS/HS
608-732-6425
uppenam@lancastersd.k12.wi.us

If you have any questions about your treatment as a participant in this study, please call or write either of us or contact:

Barb Barnet
Chair of the UW-Platteville IRB
(608) 342-1942
barnetb@uwplatt.edu

Student recording sheet

Date_____

Student code #_____

Number of steps recorded_____

(Please contact Mr. Reynolds if you have forgotten your code #)

Debriefing Memo

Thank you for your participation in Mr. Reynolds's research project. The purpose of the study was to measure how many steps students ran when listening to music and compare that number to the number of steps students ran while no music was played.

For further questions or results from this study please contact Taylor Reynolds.

Phone: 608-723-6425 ext.232

Email: reynoldst@lancastersd.k12.wi.us

Teacher Data Collection File

Code #	NM1	M1	NM2	M2	NM3	M3	NM4	M4	NM5	M5
A1	1646	1501	1507	1761	1696	1711	1672	1662	1658	1512
A2	1848	1778	1754	1768	1829	1801	1816	1830	1843	1822
A3	1868.5	1814	1836	1894	1885	1973	1855	1991	1898	1966
A4	1582	1647.25	1552	1612	1629	1652	1632	1654	1637	1671
A5	1279	1604	1680	1799	1610	1779	1589.75	1628	1790	1721
A6	1381	1879	1705.25	1704	1773	1683	1787	1655	1880	1774
A7	1782	1814	1761	1800	1740	1739	1771	1711	1814	1792
A10	1901	1821	1928	1897	1823	1947	1842	2016	1910	1907
A11	1679	1827	1756	1797	1789	1801	1710	1707	1733.5	1773
A12	1582	1605	1530	1715	1697	1639	1640	1688	1612.25	1691
A13	1699	1741	1918	1836	1856	1869	1893	1852	1904	1810
A14	1510	1530	1577	1781	1861	1859	1830	1824	1840	1786
A15	1482	1784	1612	1630	1696	1673	1759	1727	1696	1754
A16	1734	1675	1707.5	1728	1679	1637	1751	1669	1666	1721
A17	1473	1544	1521	1581	1474	1637	1593	1789	1573	1536
A18	1811	1742	1791	1795	1806	1794	1758	1735	1772	1794
A19	1920	1918	1921	1903	1823	1861	1891	1849	1882	1932
A20	1688	1725	1871	1770	1823	1901	1888	1865	1927	1842
B1	1717	1762	1776	1833	1803	1814	1775	1786	1804	1816
B2	1674.75	1631	1607	1639	1690	1627	1595	1674	1807	1817
B3	1868.5	1720	1715	1774	1731	1727	1747	1731	1743	1742
B4	1738	1738	1746	1726	1640	1833	1738	1801	1769	1816
B6	1705	1702	1698	1642	1677	1656	1668	1661	1714	1688
B7	1510	1494	1433	1551	1445	1529.25	1582	1484	1483	1588
B8	1562	1523	1521	1523	1590	1585	1562.5	1602	1577	1552
B9	1640	1678	1697	1650	1790	1670	1665	1644	1607	1608
B10	1839	1771	1785.25	1770	1758	1730	1719	1669	1825	1711
B11	1751	1743	1778	1717	1701	1710	1709	1692	1704	1718
B12	1615	1610	1526	1522	1509	1615	1655	1685	1539	1674
B13	1875	1901	1878	1758	1804	1800	1822	1794	1682	1834
B14	1740	1754	1723	1767	1666	1678	1657	1657	1669	1706
B15	1700	1668	1662	1626.75	1640	1661	1615	1592	1656	1586
B17	1820	1797	1757	1858	1836	1778	1803	1772	1835	1797
B19	1763	1744	1768	1758	1788	1804.25	1730	1857	1775	1858
B20	1454	1477.25	1427	1459	1464	1458	1454.5	1455	1473	1537
B21	1546	1516	1514	1535	1561	1514	1443	1518	1494	1520.75
B22	1618	1594	1641	1674	1642	1660	1683	1654	1610	1625
B23	1592	1609	1653	1623	1649	1685	1634	1649	1632	1715
B24	1732	1719	1733	1686	1714	1761	1743	1691	1697	1806