EFFECT OF MUSIC-LISTENING ON THE ENJOYMENT OF PHYSICAL ACTIVITY EXPERIENCE

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ABSTRACT

Effect of Music-Listening on the Enjoyment of Physical Activity Experience

(Under the Direction of Dr. Diane Groff)

Research has suggested that listening to preferred music may be helpful in increasing exercise enjoyment, positive mood, and endurance enhancement. This survey research aimed to explore the reasons why people listen to their personal stereo while engaged in physical activity, and to understand the effect this has on their level of enjoyment. Three hundred and forty six students participated in this study via convenience sampling. Participants were divided into groups depending on their active usage of a personal stereo. The Physical Activity Enjoyment Scale (PACES) was administered as the instrument. An independent-samples t test comparing the PACES mean scores of the Non-Personal Stereo and the Personal Stereo groups found a significant difference between the two groups ($t(322)= -5.338$, $p< .0005$). Participants in the Personal Stereo group reported that they felt more energized, they enjoyed their experiences more, and that they preferred being in control of the music they listened to. Overall the results suggested that that listening to self-selected music can enhance individuals' physical activity enjoyment.

Keywords:

Music, Personal Stereo, Enjoyment, Physical Activity, PACES

To my father, Mr. Weng, Shang-Jin and my mother, Ms. Chen, Hsiang-Pu, whose endless love and support made all this happen.

謝謝爸爸、媽媽，我愛你們。

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CHAPTER I

INTRODUCTION

The relationship between physical activity and health is well-documented. According to the Surgeon General's Report (U.S. Department of Health and Human Services, 1996), it is recommended that all Americans accumulate at least 30 minutes of moderate-intensity physical activity on most, if not all, days of the week. Physical activity reduces the risk of premature mortality as well as a host of other diseases such as coronary heart disease, hypertension, colon cancer, and diabetes mellitus (Centers for Disease Control and Prevention, 2001). Despite these recommendations, few Americans meet or exceed these guidelines. The Centers for Disease Control and Prevention indicated that two out of three (66%) Americans are not active at recommended levels (Centers for Disease Control and Prevention, 2006c).

A variety of physiological, behavioral, and psychological factors may affect individuals' plan to become more physically active (Centers for Disease and Control and Prevention, 2006a). The ten most common reasons adults cite for not adopting more physically active lifestyles are that they: do not have enough time to exercise, find it inconvenient to exercise, lack self-motivation, do not find exercise enjoyable, find exercise boring, lack confidence in their ability to be physically active (e.g. low self-efficacy), fear being injured or have been injured recently, lack self-management skills (e.g. the ability to set personal goals), lack encouragement, support, or companionship from family and friends, and do not have parks, sidewalks, bicycle

trails, or safe and pleasant walking paths convenient to their homes or offices (Sallis & Hovell, 1990). If we could find some ways to overcome these personal barriers, we may be able to improve the health of Americans.

Among the ten most common reasons cited above, five are associated with psychological factors (lack self-motivation, do not find exercise enjoyable, find exercise boring, lack of confidence and fear being injured). A number of these psychological barriers are related in some way to enjoyment experienced while engaged in physical activity. Enjoyment is generally defined as a positive emotion or a positive state. Enjoyment may be homeostatic in nature, resulting from the satiation of biological needs; or growth oriented, involving a cognitive dimension focus on the perception of successfully applying one's own skills to meet environmental challenges (Wankel, 1993). Often time individuals will participate in physical activities for enjoyment, even when the activities are physically punishing like boxing and marathon running (Hills & Argyle, 1998). Therefore, increasing the amount of enjoyment individuals experience while doing physical activity may be an effective way for individuals to overcome the psychological barriers listed above.

The obvious question to be answered is how can we make physical activity more enjoyable? Wankel (1993) indicated that enjoyment cannot be willed or even directly planned for and implemented. Rather, enjoyment might best be facilitated through an indirect approach. Wininger and Pargman (2003) conducted a study in the assessment of the factors associated with physical activity enjoyment. The authors found that several factors contributed to physical activity enjoyment including music used in exercise environment, exercise instructor and exercise role-identity. Of these factors, music was identified as the most important predictor of enjoyment and satisfaction of the exercise experience. Research has established that individuals who listen to music while exercising

experience increased enjoyment and endurance (Boldt, 1996).

Music has been an ample source of enjoyment, not just in physical activity, but in many aspects of life. Thanks to the invention of personal audio stereos, people are now able to carry music with them anywhere. In his recent study, Bull (2000) argued that personal stereos have revolutionized the everyday experience of millions of people. With mobility as its essential characteristic, personal stereos enable individuals to do many activities accompanied by their own “individualized” soundworld. It is a very direct and powerful form of technological artifact which re-prioritizes the auditory nature of an experience with an unusual directness and immediacy. Bull (2000) developed a typology of personal stereo use that includes three categories. Individuals might use personal stereos to block out unwanted external sounds and thus be distracted from their surroundings. Secondly, individuals can choose to listen to their preferred music and create an aesthetic experience by choosing the "correct music" which "suits" the environment and their mood. Finally, individuals can use personal stereos to become "energized" and avoid the intrusions of others to their personal space (Bull, 2000).

The behavioral pattern Bull identified is related to the notion of autonomy and fun-seeking, which represents a core element of self-determined behavior. Self-Determination Theory (SDT) explains the psychological process that promotes optimal functioning and health (Ryan & Deci, 2000). According to SDT, innate psychological needs of autonomy, competence, and relatedness guide self-determined behavior (Standage, Duda & Ntoumanis, 2003). Autonomy refers to intrinsically motivated behavior that an individual freely engages in for the sake of feeling fun, pleasure and satisfaction from participation in an activity (Deci & Ryan, 1985; Ryan & Deci, 2000). When the participants in Bull's study showed high autonomy in choosing the music they prefer to listen to or when they created an aesthetic experience with suitable

music for different physical surroundings, their actions were described as self-determined behaviors. By engaging in self-determined behaviors individuals may ultimately help to increase the amount of enjoyment they experience.

Statement of the Problem

Based on previous studies, listening to music enhances endurance, serves as a source of distraction, and is a source of enjoyment during physical activity (Beckett, 1990; Boldt, 1996). Wininger and Pargman (2003) have indicted that an individual's preference of music is a critical factor in physical activity enjoyment, yet one's music preferences were not well-controlled in their study. To overcome the shortcomings of previous studies, the ability to select one's music while exercising should be controlled. The use of personal stereos can be a good way to control for this factor. Since personal stereos are typically brought by participants and can be used anytime and anywhere, they have the effect of representing participants' free will to listen to music when engaged in physical activity. Through the exploration of one's motivations to be physically active, we may be able to more fully understand the relationship between music-listening and enjoyment.

Statement of Purpose

The purpose of this study was to explore the reasons why people listen to their personal stereo while engaged in physical activity at a fitness facility, and to understand the effect this has on their level of enjoyment.

Research Questions

1. Do people have a more enjoyable leisure experience if they listen to self-chosen music while doing physical activity?
2. What motivates individuals to listen to or not listen to self-chosen music while doing physical activity?

Alternative Hypothesis

Based on previous studies it could be anticipated that individuals who listen to their preferred music while exercising will experience higher enjoyment level when compared to individuals who do not listen to their own preferred music. Therefore, this study tested the following hypothesis.

H_1: When engaged in physical activity, individuals who listen to preferred music will have a higher enjoyment level than individuals who do not listen to their own music.

Limitations

Preferred music was defined as the music individuals bring with them, and generally it was listened to with the headset they wore when engaged in physical activity. However, wearing a headset might not completely eliminate the effect of listening to background music while exercising. Therefore, this study might not completely test the effect of only-listening to self-selected music.

Delimitations

This study was delimited to the patrons of a fitness facility located on a university campus.

Definition of Terms

"Both" group

The "Both" group refers to those who brought the personal stereo device but only used it while doing some physical activities.

Enjoyment

Enjoyment is viewed as a positive emotion or a positive state (Wankel, 1993).

Non-Personal Stereo Group

The Non-personal Stereo group refers to those participants who did not wear a personal stereo device while exercising.

Personal Stereo

A personal stereo is a portable music playing device (Bull, 2000).

Personal Stereo Group

The Personal Stereo group refers to those participants who used a personal stereo device while exercising.

Physical Activity

Physical activity is any bodily movement produced by skeletal muscles that result in an expenditure of energy (Centers for Disease Control and Prevention, 2006b).

Recommended Physical Activity

Recommended physical activities are reported moderate-intensity activities in a usual week (i.e., brisk walking, bicycling, vacuuming, gardening, or anything else that causes small increases in breathing or heart rate) for greater than or equal to 30 minutes per day, greater than or equal to 5 days per week; or vigorous-intensity activities in a usual week (i.e., running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate) for greater than or equal to 20 minutes per day, greater than or equal to 3 days per week or both. This can be accomplished through lifestyle activities (i.e., household, transportation, or leisure-time activities) (Centers for Disease Control and Prevention, 2006b).

Self-Determination Theory

Self-determined behavior is autonomous, self-regulated activity that leads to psychological empowerment and self-realization (Wehmeyer, Kelchner & Richards, 1996). The Self-Determination Theory (SDT) assumes that innate psychological needs of

autonomy, competence, and relatedness guide self-determined behavior (Standage et al., 2003). SDT explains the psychological process that promotes optimal functioning and health (Ryan & Deci, 2000).

Student Recreation Center (SRC)

The Student Recreation Center is a fitness center located on the campus of the University of North Carolina at Chapel Hill. Facilities include hammer strength plate-loaded equipment, free weights and a variety of cardiovascular equipment.

Ram's Head Center

The Ram's Head Center is a fitness center located on the campus of University of North Carolina at Chapel Hill. Facilities include three basketball/volleyball courts, weight training and cardio areas, a multi-purpose studio, suspended indoor track, and an indoor climbing wall.

CHAPTER II

REVIEW OF LITERATURE

This review of the literature will present the research and the theoretical framework relevant to this study. The impact of the personal stereo on everyday life will be discussed first. Attention will then turn to the theoretical framework of this study. Throughout this chapter the findings and the gaps in previous literature will be offered.

The Impact of Personal Stereo Use on Everyday Life

Personal stereos are portable music playing devices that allow individuals to listen to music without the limitation of place and activity. The mobility of personal stereos represents a very direct and powerful form of technology that has re-prioritized the auditory nature of experiences (Bull, 2000). Personal stereos are widely applied in many individuals' daily lives and have made significant, yet uncertain, impact. They are often used on the move, such as on foot, bicycle, the buses, trains and airplanes. We can see people use personal stereos when waiting at bus stops or in the airport lounges, walking down the streets or just sitting in a cafe. Sports people take them while engaged in many types of physical activities such as jogging, bicycle-riding, swimming, skiing and weight-lifting, and they may be used indoors or outdoors. Individuals may even go to sleep with them on, walk around the house with them and avoid discussion by using a personal stereo (Bull, 2000).

Bull (2000) analyzed the significance and meaning of personal stereo use in the

individuals' everyday life. Through an analysis of ethnographic material in personal stereo use, he constructed a critical phenomenology of auditory experience. Individuals who use personal stereo often refer to their experiences as being "cinematic" in nature. The experience of using personal stereos is often characterized as all engulfing which individuals describe as being saturated with sound.

"Aestheticization" is one distinct feature of personal stereo use, and refers to how a mood is created and maintained through music or to control and exclude thoughts. Some individuals will pick music to "suit" the environment they pass through. Individuals who use personal stereos describe aesthetically recreating their environment through individually chosen music. Personal stereos used in this way would permit the promotion of aesthetic experience (Bull, 2000). Bull identified the reasons why individuals are motivated to use personal stereos. They may use personal stereo to block out any unwanted external sounds and to distract from the physical surroundings. They can choose to listen to their preferred music, and thus be able to create an aesthetic experience when they choose the "correct music" which "suits" the environment and their mood. They often become energized; they can also avoid the intrusion of others to their personal space when using personal stereos (Bull, 2000).

The motivations Bull offered to describe personal stereo use is reflective of many of the ideals put forth in the Self-Determination Theory (SDT). The desire to feel in control over one's mood, to have the freedom to select the music they listen to, and to create the aesthetic environment and control an experience are all reminiscent of autonomous behavior. Therefore, SDT may be very helpful toward explaining why more and more individuals are doing physical activities with their personal stereos.

Self-Determination Theory

The Self-Determination Theory (SDT) is primarily concerned with explaining the psychological process that promotes optimal functioning and health (Ryan & Deci, 2000). According to SDT, innate psychological needs of autonomy, competence, and relatedness guide self-determined behavior (Standage et al, 2003). Among the three main points of SDT, innate psychological need refers to the need for autonomy. Maturana and Varela (1992) pointed out that the more autonomous an individual's actions, the more the individual has specified, processed, and hierarchicalized in an unfettered manner personal needs in relation to environmental affordances. One's need for autonomy also relates to intrinsic motivation, which refers to an individual engaged in highly autonomous behaviors for the sake of feeling fun and satisfaction from participation in the activity (Deci & Ryan, 1985; Ryan & Deci, 2000).

Self-Determination Theory has historically been used to explain leisure experiences, because most leisure behavior is volitional and individuals are often active in their pursuit of positive behaviors and activities (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003). The hypothesis that listening to preferred music while engaged in physical activity is a self-determined behavior that can result in a host of outcomes will be explored in more detail below.

Interrelationships among Enjoyment, Music and Physical Activity

Enjoyment

Enjoyment is a central feature of any leisure engagement. More broadly, enjoyment, fun, pleasure, play and optimal experience are all important aspects of recreation activities (Estes & Henderson, 2003). Enjoyment can be described as a positive affective state that reflects feelings such as pleasure and fun (Motl, Dishman, Saunders, Dowda, Felton & Pate, 2001).

Wankel (1993) indicated that enjoyment is clearly linked to the concept of intrinsic motivation. Intrinsic motivation involves individuals freely engaging in activities they find interesting, novel and challenging. Individuals tend to seek out activities that are likely to provide them with intrinsic rewards (Deci & Ryan, 2000). A behavior is said to be intrinsically motivating when it takes place in the absence of any extrinsic rewards, and when it is engaged in strictly for the enjoyment it provides. Thus, in their discretionary time individuals tend to choose to participate in activities they enjoy (Wankel, 1993).

Enjoyment and Physical Activity

Preliminary evidence suggests that there is a relationship between physical activity and enjoyment. Hills and Argyle (1998) found that individuals would participate in physical activities for enjoyment, even when the activities were physically punishing like boxing and marathon running. Motl and colleagues (2001) conducted a study to measure the enjoyment level of physical activity in adolescent girls. The researchers found that promoting enjoyment of physical activity may increase maintenance of physical activity and sport by youth and perhaps decrease the attractiveness of alternative activities such as watching television or playing videogames. Similarly, Wankel (1993) reviewed current studies and concluded that although there was considerable indirect evidence for the importance of enjoyment to exercise adherence and for the importance of enjoyment, or more broadly intrinsic motivation, to psychological health; there should be more systematic, specific research on this topic.

Enjoyment and Music

Davis and Thaut (1989) conducted a study on the influence of preferred music on physiological and psychological responses. In their study, preferred music was defined as self-selected music by the participants. The physiological data collected included (a)

vascular constriction, (b) heart rate, (c) muscle tension, and (d) finger skin temperature. The psychological data were assessed using the Spielberger State Anxiety Inventory and a seven-point Likert type scale for self-rated relaxation. The results showed that listening to preferred music was effective in reducing anxiety and in enhancing relaxation. Similarly, Stratton and Zalanowski (1984) conducted a study regarding the relationship between degree of liking of the music and self-reported relaxation. They found that the most important factor in relaxation was the degree of liking for the music. These authors concluded that individual preferences must be considered when using music to aid relaxation.

"Correct Music"

Bull (2000) presented the concept of "correct music" in his research. "Correct music" is defined as the music that matches those individuals' moods, feelings, and the environment where they are situated. Many individuals will invariably have special tapes containing music only listened to on their personal stereos. This music might have some personal association for them and thus functions as an auditory mnemonic which might put them in the desired mood for the journey or day ahead. Failure to have the "correct music" invariably makes the personal stereo dysfunctional, leading individuals to switch their machines off as a preferable alternative to listening to "incorrect music." "Incorrect music" is defined in terms of the sounds not matching either the mood of these individuals, or their surroundings. While some individuals who use personal stereo may have a heightened sense of presence, others attempt to block out thoughts, or any sense of presence in order to "go with the flow" of the music. In doing so, unwanted or uncontrollable thoughts are often blocked out. In these situations, personal stereo use can act as an emotional stabilizer to the person producing the desired state of mind. This "correct" frame of mind enables them to successfully confront daily life situations.

Music and Physical Activity

Research regarding the relationship between music and exercise suggests that the application of motivational music (Karageorghis & Terry, 1997) can stimulate individuals to reach higher objective sub-maximal exercise intensities while not being consciously aware of their increased effort. Participants also experienced heightened levels of positive affective states during the experience. Boldt (1996) demonstrated that music helped to increase exercise endurance over the long term and increased subjects' self-reported relaxation level. Beckett (1990) also indicated that music had a positive effect on exercise. In Beckett's research thirty minutes of walking at an aerobic speed was defined as exercise while three different music settings were provided as the independent variables: no music, continuous music and intermittent music. The results showed that music had a statistically significant effect on aerobic exercise with subjects who exercised with music were able to walk farther and with less effort than people who exercised without music (Beckett, 1990).

Karageorghis and Terry (1997) reviewed previous studies about the psychophysical effects of music in sport and exercise and identified the following four mechanisms through which music may have a psychophysical effect in sport and exercise: (a) it reduces sensations of fatigue; (b) it improves mood state; (c) it influences psychomotor arousal; and (d) it encourages synchronization. They also stated some limitations in the previous research, with the major one being the difficulty of specifying music selections and the way they are delivered.

Music and Physical Activity Enjoyment

Wininger and Pargman (2003) conducted a study on the factors contributing to physical activity enjoyment. They identified three factors: (a) satisfaction with the music used in the exercise environment, (b) satisfaction with the exercise instructor, and (c)

salience of exercise role-identity. The instrument utilized in their study was the Physical Activity Enjoyment Scale (PACES), which is a reliable and valid instrument that has been designed to assess the level of exercise enjoyment (Kendzierski & DeCarlo, 1991). Results indicated that music was the most important factor influencing exercise enjoyment and contributed to regular engagement in physical activity.

Statement of the Problem

The use of personal stereos will inherently have different meaning to different individuals based on their preference. They often listen to personal stereos while engaged in physical activity because it allows them to block out thoughts and feel more energized. Listening to preferred music also appears to be helpful in reducing anxiety, enhancing relaxation, increasing exercise enjoyment, positive mood, endurance enhancement, and distraction from fatigue. However, in the study regarding the factors affected physical activity enjoyment, Wininger and Pargman (2003) suggested that having the ability to make self-determined decisions regarding what music is played during exercise is a critical factor in this relationship and one that was not controlled for in their study. Therefore, the extent that enjoyment is impacted when individuals have the opportunity to listen to their preferred music needs to be examined. This study sought to answer the following questions:

1. Do people have a more enjoyable leisure experience when doing physical activities with self-chosen music?
2. What motivates individuals to listen to or not listen to self-chosen music while exercising?

CHAPTER III

METHODOLOGY

The purpose of this study was to explore the reasons why people listen to their personal stereo while engaged in exercise at a fitness facility, and to understand the effect this has on their level of enjoyment. In this chapter the selection of participants, instrumentation, procedures and data analysis procedure are presented.

Selection of Participants

Convenience sampling was used to elicit the participation of 346 students who had just completed participating in exercise at the Student Recreation Center (SRC) and Ram's Head Center. Participants were asked to complete the survey on-site right after they finished doing physical activities at the SRC and Ram's Head Center. Participants were divided into three groups: those who did physical activity with their personal stereo device (Personal Stereo group), those who did physical activity without personal stereo device (Non-personal Stereo group) and those who brought the personal stereo device but only used in doing some physical activities (Both group).

Instrumentation

The Physical Activity Enjoyment Scale (PACES) developed by Kendzierski and DeCarlo (1991) was selected for use in this study (see Appendix A). The instrument consisted of a set of 18 seven-point bipolar items that were designed to assess the level of exercise enjoyment. From the developmental data reported by Kendzierski

and DeCarlo (1991), the PACES was found to have acceptable internal consistency, reliability and validity.

The internal consistency of the 18-item PACES scale was .93 as assessed by Cronbach's (1951) coefficient alpha. The item-total correlations ranged from r=.35 to r=.89 for study one, and r=.45 to r=.87 for study two. Kendzierski and DeCarlo (1991) also stated that PACES would provide the necessary tool for examining the relationship between enjoyment and exercise adherence, as well as for identifying variables that affect individuals' enjoyment of both exercise and sport.

In addition to the PACES, information regarding participants' gender, location of participation, motivator of physical activity, type of physical activity, reasons why or why not bring personal stereo when engaged in physical activity, and the preference of music genre for physical activity was also collected. These questions were developed by the researcher for use in this study (see Appendix A).

Procedures

Prior to starting the research study, approval from the Institutional Review Board at the University of North Carolina at Chapel Hill was received (see Appendix B).The questionnaires along with the fact sheet (see Appendix C) were placed at of the front desk of SRC and Ram's Head Center from November 21st, 2005 to December 1st, 2005. The front desk staff of the two facilities reminded outgoing patrons of the opportunity to participate in this study. The questionnaire was administered to volunteer participants after they had received a fact sheet regarding the study and provided implied consent to participate (see Appendix C). Individuals who volunteered to complete the survey were asked to complete the survey on-site immediately after they finished exercising and place it in the locked box located at the front desk. The researcher also positioned himself in the front entrance of the two facilities two to three times a day during the research period to

oversee the data collection process and invite students to participate in the study. The researcher collected surveys from the boxes every day when the facilities closed.

Data Analysis

The survey consisted of two parts. The first part of the survey was the PACES and the second part was the demographic data, motives for using or not using personal stereos and the reasons why they would or would not use personal stereos during physical activities. For the first part, the PACES scores were added up and compared using independent samples t tests based on groups. For the second part, both descriptive and inferential statistics were used to describe the preferences of the groups and explore any differences that might exist between the groups. A content analysis was applied to the one open-ended question. The participants' answers were analyzed by focusing on the frequent occurrence of similar terms which represented specific meanings or thoughts (Ritchie & Lewis, 2003). This process resulted in common categories of participants' responses. For example, if two participants replied as: "I have no CD player" and "I don't have an iPod," these two answers would be categorized as "lacking of music-playing device."

CHAPTER IV

RESULTS

This chapter presents the results of data analysis. Descriptive and inferential statistics were performed to test the hypotheses. Due to the relatively small sample size, data of the "Both" group were taken into consideration in the descriptive statistics only. Descriptive statistics regarding gender, age, exercise location, motives, activity types and music types for each group are presented. The comparison of the PACES mean score for the Non-Personal stereo and the Personal Stereo group are also presented. The qualitative data were analyzed with content analysis and organized into several response categories.

Descriptive Statistics

Responses of three hundred and forty six participants were collected in the SRC and Ram's Head Center at the University of North Carolina at Chapel Hill from November 21st to December 1st, 2005. Participants consisted of three groups: the Non-Personal Stereo (n=176), Personal Stereo (n=148) and Both (n=22). Age of the participants ranged from 17 to 53, with a mean of 21.79 years old. The descriptive statistics including gender, age and the exercise location are presented in Table 1.

Table 1:

Descriptive Statistics in Gender, Age and Exercise Location

	Gender		Age		Exercise Location	
Group	Female	Male	*M*	*SD*	SRC	Ram's Head Center
Non-Personal Stereo	54	122	22.1136	5.31506	111	65
Personal Stereo	104	44	20.6892	3.20682	77	71
Both	12	10	22.5909	8.00987	10	12
Total	170	176	—	—	198	148

In response to the question, "What motivates you most while you are exercising," the Personal Stereo group identified "Music" and "Fitness" as the top two motivations. The Non-Personal Stereo group reported "Fitness" and "Music" as top motives. The majority of the Personal Stereo group (44.7%) chose to do Cardio-Vascular activity, and the top two activity choices of Non- Personal Stereo group were Cardio-Vascular (30.5%) and Strength Training (29.8%). The top three choices of music types for physical activities were Hip-hop/Rap (21.3%), Pop (16.3%) and Rock/Metal (15.6%) for the Personal Stereo group (See Table 2).

Responses regarding the reasons why individuals did or did not listen to personal stereo while exercising were categorized using content analysis. For the Personal Stereo group and the "Both" group, participants reported they felt more energizing, more enjoyable, and more controllable; sometimes personal stereo listening would be viewed as a form of escape. The major reasons for not using a personal stereo were inconvenience, lacking of music playing device to carry, and satisfaction with the background music. Some individuals also reported they did not really care if there was music or not.

Inferential Statistics

An independent-samples *t* test comparing the PACES mean scores of the Non-Personal Stereo and the Personal Stereo groups found a significant difference between the two groups ($t(322) = -5.338$, $p < .0005$). The mean of the Personal Stereo group (M=40.9122, SD=8.87167) was significantly higher than the mean of the Non-Personal Stereo group (M=34.9830, SD=10.78913). Among the 176 participants who reported "Music" as the most motivating factor, 116 participants were in the Personal Stereo group and the PACES mean score of these 116 participants was 41.1207, which was the highest in all groups in this study.

Table 2:

Descriptive Statistics of Motives, Activity Types and Music Types

	Non-Personal Stereo	Personal Stereo	Both
Motive			
Environment	11.7%	8.7%	6.7%
Fitness	38.3%	22.1%	23.3%
Friends	17.8%	10.1%	16.7%
Instructor	3.5%	.5%	3.3%
Music	20.4%	55.8%	43.3%
Other	8.3%	2.9%	6.7%
Total	100%	100%	100%
Activity Type			
Cardio-Vascular	20.7%	44.7%	51.4%
Fitness Class	2.4%	.0%	2.9%
Free Weight	29.8%	22.3%	14.3%
Open Gym	14.9%	10.2%	14.3%
Spin Class	1.7%	.8%	.0%
Strength Training	30.5%	22%	17.1%
Total	100%	100%	100%
Music Type			
Blues		1%	2.4%
Classical		1.2%	2.4%
Country		6.3%	2.4%
Dance		7.3%	5.9%
Electronic		3.8%	4.7%
Gospel		.6%	3.5%
Hip-hop/Rap		21.3%	17.6%
Jazz		1%	4.7%
Latin-American		3.8%	3.5%
Melodic		.4%	2.4%
Other		1.9%	1.2%
Popular		16.3%	14.1%
Punk		7.5%	9.4%
Reggae		2.5%	5.9%
R&B		9.4%	3.5%
Rock/Metal		15.6%	16.5%
Total		100%	100%

In an effort to determine additional factors that may contribute to differences between groups, gender analyses were performed. An unexpected finding occurred with

respect to gender. There were 170 female and 176 male participants. The majority of the female participants (61.2%) used a personal stereo while the majority of males (69.3%) did not (See Table 3).

Table 3:

Number and Percentage Based on Gender in the Three Groups

Gender	N	Percent
Female		
Non-Personal Stereo	54	31.8%
Personal Stereo	104	61.2%
Both	12	7.1%
Total	170	100%
Male		
Non-Personal Stereo	122	69.3%
Personal Stereo	44	25%
Both	10	5.7%
Total	176	100%

Female participants were motivated most by the factor "Music" while the male participants were most motivated by "Fitness." The majority of the female participants (48.1%) chose to do Cardio-Vascular activity, while the top two activity choices for males were Free Weight (34.3%) and Strength Training (33.0%). The top two music genre choices for the female participants were Popular (20.1%) and Hip hop/Rap (19.9%), and the favorite two choices for the male participants were Hip-hop/Rap (22.8%) and Rock/Metal (20.8%) (See Table 4). The majority of the male participants (69.3%) did not bring a personal stereo with the reason most often cited as the "feeling it as a hassle."

An independent-samples *t* tests comparing the PACES mean scores based on gender indicated a significant difference between females and males ($t(344)= 2.184$, $p< .05$). The mean of the female group (M=38.8529, sd=9.23440) was significantly higher than the mean of the male group (M=36.4375, sd=11.20951).

Table 4:

Gender Based Descriptive Statistics of Motives, Activity Types and Music Types

	Female	Male
Motive		
Environment	9%	11.1%
Fitness	27.4%	32.9%
Friends	13.2%	15.4%
Instructor	2.6%	1.7%
Music	44.9%	30.3%
Other	3%	8.5%
Total	100%	100%
Activity Type		
Cardio-Vascular	48.1%	19.4%
Fitness Class	2.5%	.3%
Free Weight	16.1%	34.3%
Open gym	13.7%	12%
Spin Class	1.4%	1%
Strength Training	18.2%	33%
Total	100%	100%
Music Type		
Blues	.0%	2.6%
Classical	1%	2%
Country	7.1%	3%
Dance	8.3%	4.6%
Electronic	2.2%	7.6%
Gospel	1%	1%
Hip-hop/Rap	19.9%	22.8%
Jazz	1.2%	2%
Latin-American	4.7%	2%
Melodic	.5%	1%
Other	1.7%	2%
Popular	20.1%	7.6%
Punk	7.1%	9.1%
Reggae	2.5%	4.1%
R&B	9.6%	6.6%
Rock/Metal	13.2%	20.8%
Total	100%	100%

Summary of Results

Based on the results of the independent samples *t* tests, the null hypothesis suggesting that the Personal Stereo group would not reach higher levels of enjoyment was rejected. We can infer from this research that the Personal Stereo group reached relatively higher enjoyment levels than the Non-Personal Stereo group. Responses collected and analyzed provided some explanation as to why individuals would or would not use personal stereos while engaged in physical activities. The participants in the Personal Stereo group felt more energized, they enjoyed their experiences more, and they preferred being in control of the music they listened to. The overall results provided evidence for the assertion made by Karageorghis and Terry (1997) that listening to music while exercising has a psychophysical effect on participants. Findings of this study also support Wininger and Pargman's (2003) findings that preference of music may enhance individuals' physical activity enjoyment.

CHAPTER V

DISCUSSION

The purpose of this study was to explore the reasons why people listen to their personal stereo while engaged in physical activity at a fitness facility, and to understand the effect this behavior has on their level of enjoyment. Findings in this study attempted to establish a better understanding that if physical activity enjoyment level is affected by self-chosen music, and the reasons why individuals use or do not use self-chosen music during physical activity.

The findings clearly indicated that individuals' enjoyment level was positively affected by self-chosen music. The Personal Stereo group reached a higher enjoyment level than the Non-Personal Stereo group. This was further supported by the fact the participants who reported music as the most motivating factor and actually exercised with their personal stereo, reached the highest enjoyment level among all groups. The results of this study are similar to those of Wininger and Pargman (2003) which indicated that music was the most important factor affecting enjoyment and satisfaction with exercise.

Responses of the participants in the Personal Stereo group provided some explanation for the reasons why individuals would use personal stereos while engaged in physical activity. The participants in the Personal Stereo group reported that they brought and exercised to their personal stereos because they felt more energized, enjoyed it more, and that they preferred being in control of the music they listened to. The results supported Karageorghis and Terry's (1997) findings of the psychophysical

effects of music on physical activity. These effects include reduced sensations of fatigue, improved mood state, psychomotor arousal and increased synchronization (Karageorghis & Terry, 1997). The results were also consistent with Bull's (2000) findings. Individuals who use personal stereos usually emphasize the importance of using the "correct music" to control their mood and feelings, and that experience a heightened sense of presence in order to "go with the flow" of the music (Bull, 2000).

A finding that has not previously been discussed in the literature was the gender differences found in this study. Gender differences were found in three areas: motivations, physical activity types and physical activity enjoyment level. Female participants were mostly motivated by music while male participants were motivated by fitness. The majority of the female participants chose to do Cardio-Vascular activity, while most male participants preferred Free Weights and Strength Training. The female participants also reached higher physical activity enjoyment levels than the male participants. One potential explanation for this difference could be the fact that the majority of the female participants (61.2%) used a personal stereo while the majority of males (69.3%) did not. However, another explanation could be that it was much easier for the participants who chose to do Cardio-Vascular activities to use their personal stereos than the participants who chose to do other activities such as Free Weights and Strength Training. The wires of the personal stereos may limit some physical actions.

Self-Determination Theory may help to explain the results and responses from the Personal Stereo group and Non-Personal Stereo group. An individual may engage in highly autonomous behaviors for the sake of feeling fun, pleasure and satisfaction from participation in an activity (Deci & Ryan, 1985; Ryan & Deci, 2000). Participants who used personal stereo while exercising seemed to have a more enjoyable experience. The action of using a personal stereo while exercising can be interpreted as self-determined

behavior. Engaging in this type of self-determined behavior may positively impact the enjoyment level experienced. By choosing not to use a personal stereo, individuals were also engaged in self-determined behavior. For example, they were motivated by music and they were satisfied with the background music, so they chose not to use the personal stereo. This might help to explain why some of the participants in the Non-Personal Stereo group still had relative high scores on the PACES.

Implications for Future Research and Practitioners

As previous and current studies have established, physical activity enjoyment is a positive incentive for consistent engagement in physical activity, which will ultimately affect the health and quality of life of Americans. Results of this study have further indicated that preferred music has a positive effect on perceived physical activity enjoyment. However, some factors seemed to affect participants' preference in the music they would use when engaged in physical activity in this study. The top three music genre choices cited by the participants in this study for physical activities were Hip-hop/Rap (21.3%), Pop (16.3%) and Rock/Metal (15.6%). "Upbeat music" was a common comment made by the participants regarding these three genres, and this somewhat reflected the participants' needs to exercise to music that had a steady rhythm. Further exploration of specific music genre or the musical characteristic such as the tempo, rhythm, pitch or timbre, is needed.

Music-listening appears to be a good way to provide physical activity enjoyment for both females and males. However, the results of this study demonstrated gender differences in motivations, physical activity type and physical activity enjoyment level. The females appears to be motivated by music and they prefer to listen to their personal stereos when engaged in cardio-vascular activities such as jogging or cycling. In doing so, they could usually reach higher levels of physical activity enjoyment. The male

participants appeared to be motivated by their pursuit of fitness and physique. They preferred physical activities such as strength training or free weights, and generally reached average or lower physical activity enjoyment levels. The findings regarding gender differences hold some implications for practitioners who desire to meet customers' needs. If the patrons of the facility are mainly female, the use of personal stereos or the provision of a good variety background music could encourage their engagement in physical activity. For the male patrons, the provision of strength training programs and personal fitness coaches may be a potential way to increase their enjoyment in physical activity. A general concern of the male participants in this study who chose not to use a personal stereo was that the wires of the personal stereo limited their physical actions. If they did not experience the constraints, the male participants would also prefer to use a personal stereo. With the advance of technology, a wireless headset may be one solution to this problem in the future. Until wireless technology is readily accessible and affordable for personal use, the provision of background music appears to be the most helpful. If there could be staff at the facility who were responsible for playing music CDs or cassettes in response to their patrons' music choices, individuals may also be able to reach higher physical activity enjoyment levels.

For the practitioners in a variety of environments that encourage physical activity, it is important to consider the enjoyment of the experience that will lead to customer satisfaction and positive experience with the organization. It is suggested that managers either encourage patrons to bring their own personal stereos or place installed music playing devices on equipment to provide a source of enjoyment for patrons. The music playing devices should be installed especially on the cardio-vascular machines like the treadmill and the bikes. Conducting periodic surveys of patrons' music preferences is also suggested. So that managers are able to play music that meets patrons' needs. It is also

suggested that the organization purchase personal stereos and establish a check-out system for patrons with limited resources.

Summary

The findings in this study indicated that individuals' enjoyment level was positively affected by listening to self-chosen music. Individuals who brought and exercised to their personal stereos felt more energized, enjoyed it more, and preferred being in control of the music they listened to. Listening to music on their headsets helped them to block out unwanted thoughts and concentrate on the physical activity. Their behavior could be viewed as a kind of self-determined behavior, which may ultimately lead to heightened enjoyment levels. Females may be more prone to have an enjoyable exercise experience since they more frequently listen to their preferred music. Given that enjoyment is a factor in exercise adherence and endurance, females who listen to music while exercising may experience long-term health benefits.

Based on the findings of this study it is suggested that researchers explore the factors that may affect participants' preference in the music they would use when engaged in physical activity. Factors to consider include the specific music genres and musical characteristics (such as the tempo, rhythm, pitch and timbre). Based on the findings of this study, managers of health clubs or similar organizations can encourage patrons to bring their own personal stereos when exercising. Installation of music playing devices that provide a source of enjoyment for patrons could also be placed on equipment. This practice would especially be relevant for the cardio-vascular machines like the treadmill and the bikes.

APPENDIX A

Research Instrument

Physical Activity Enjoyment Scale

Please rate how you feel *at the moment* about the physical activity you have just been doing.

1	2	3	4	5	6	7
I enjoy it						I hate it
1	2	3	4	5	6	7
I feel bored						I feel interested
1	2	3	4	5	6	7
I dislike it						I like it
1	2	3	4	5	6	7
I find it pleasurable						I find it unpleasurable
1	2	3	4	5	6	7
I am very absorbed in this activity						I am not at all absorbed in this activity
1	2	3	4	5	6	7
It's no fun at all						It's a lot of fun
1	2	3	4	5	6	7
I find it energizing						I find it tiring
1	2	3	4	5	6	7
It makes me depressed						It makes me happy
1	2	3	4	5	6	7
It's very pleasant						It's very unpleasant
1	2	3	4	5	6	7
I feel good physically while doing it						I feel bad physically while doing it
1	2	3	4	5	6	7
It's very invigorating						It's not at all invigorating
1	2	3	4	5	6	7
I am very frustrated by it						I am not at all frustrated by it
1	2	3	4	5	6	7
It's very gratifying						It's not at all gratifying
1	2	3	4	5	6	7
It's very exhilarating						It's not at all exhilarating
1	2	3	4	5	6	7
It's not at all stimulating						It's very stimulating
1	2	3	4	5	6	7
It gives me a strong sense of accomplishment						It does not give me a strong sense of accomplishment
1	2	3	4	5	6	7
It's very refreshing						It's not at all refreshing
1	2	3	4	5	6	7
I felt as though I would rather be doing something else						I felt as though there was nothing else I would rather be doing

Gender: ☐ Female ☐ Male Age:_____

Where did you work out today? ☐ SRC ☐ Ram' s Head

What motivates you MOST while you are exercising?

☐ Environment ☐ Music ☐ Instructor
☐ Friends ☐ Fitness ☐Other _____

Did you listen to your own music while exercising?

☐ No (→Please answer Section A)
☐ Yes (→Please answer Section B)
☐ I did both (→Please answer Section C)

Section A.

1. What exercise activities did you do today? (Check all that apply)

☐Fitness Class ☐Spin class ☐Cardio-Vascular
☐Strength Training ☐Free Weight ☐Open Gym

2. I do not listen to my own music while exercising because _____

_____

Section B.

1. During which exercise activities did you listen to your own music? (Check all that apply)

☐Fitness Class ☐Spin class ☐Cardio-Vascular
☐Strength Training ☐Free Weight ☐Open Gym

2. I listen to my own music while working out because _____

_____

3. What type of music do you like to listen to while exercising? (Check all that apply)

☐Pop ☐Country ☐Jazz ☐Blues ☐Latin-American
☐R&B ☐Rock/Metal ☐Classical ☐Electronic ☐ Dance
☐Melodic ☐Reggae ☐Punk ☐Hip hop / Rap ☐Gospel ☐Other_

Section C.

1. During which exercise activities did you listen to your own music? (Check all that apply)

☐Fitness Class ☐Spin class ☐Cardio-Vascular
☐Strength Training ☐Free Weight ☐Open Gym

2. During which exercise activities did you NOT listen to your own music? (Check all that apply)

☐Fitness Class ☐Spin class ☐Cardio-Vascular
☐Strength Training ☐Free Weight ☐Open Gym

3. I listen to my own music while working out because _____

_____

4. What type of music do you like to listen to while exercising? (Check all that apply)

☐Pop ☐Country ☐Jazz ☐Blues ☐Latin-American
☐R&B ☐Rock/Metal ☐Classical ☐Electronic ☐ Dance
☐Melodic ☐Reggae ☐Punk ☐Hip hop / Rap ☐Gospel

Thank you! Your response is very helpful!

APPENDIX B

IRB Approval

Ting-Chun Weng

TO:	Diane Groff
DEPARTMENT:	Exercise and Sport Science
ADDRESS:	CB# 8700 Campus
DATE:	11/18/2005
FROM:	Lawrence B. Rosenfeld Behavioral Institutional Review Board
IRB NUMBER:	EXSS 2005-014
APPROVAL PERIOD:	11/18/2005 through 11/17/2006
TITLE:	Effect of Music-listening on the enjoymnet of Physical Activity Experience
SUBJECT:	Expedited Protocol Approval Notice--New Protocol

The above research study has been reviewed and approved by the Behavioral IRB Chair or Co-Chair, on an Expedited basis, Category 7.

[✓] New approval [ ] Renewal approval [ ] Modification approval per 45 CFR 46.110(b)(2)
[ ] Secondary data

Please note that, if checked, the following Federal regulations are applicable to this research study:

[ ] 45 CFR 46.404 -The IRB finds that no greater than minimal risk to children is presented, and that adequate provisions have been made for soliciting the assent of the children and the permission of their parents or guardians, as set forth at 45 CFR 46.408.

[ ] 45 CFR 46.116(d) - Approval of a consent procedure that does not include all of the elements of informed consent, or a waiver of the requirement to obtain informed consent has been satisfied.

[✓] 45 CFR 46.117(c)(2) - Waiver of the requirement for documentation of written (signed) consent.

[ ] 45 CFR 164.512 - Criteria for waiver of HIPAA Authorization have been satisfied.

[ ] 45 CFR 164.508 - HIPAA Authorization Form approved.

The above Approval Period informs you of the date that IRB approval expires for this research study. You will be notified in advance of this date to submit an application for renewal or termination of IRB approval.

Please note that IRB approval is required prior to any modifications being made to this research study.

If you have any questions or concerns about your study's approval, please contact the Behavioral IRB Office at 962-7761 or e-mail the office at aa-irb-chair@unc.edu. Thank you.

Approved by:

Behavioral IRB Chair or Co-Chair

11/18/05
Date of Approval

APPENDIX C

Fact Sheet and Implied Consent

DEPARTMENT OF EXERCISE AND SPORT SCIENCE

Effects of Music-Listening on the Enjoyment of Physical Activity Experience

As a graduate student in the Department of Exercise and Sport Science at the University of North Carolina at Chapel Hill I, Ting-Chun Weng, am studying the effect of music-listening on the enjoyment of physical activity. I would appreciate your participation in this research study; it should only take about two minutes. Your involvement is completely voluntary—you can stop anytime you wish to—and you do not have to answer any questions you do not care to answer for any reason.

The study involves filling out a short survey. The responses of all particiapants (approximately 380) will be anonymous.

If you have any questions about the study please feel free to contact me at 919-923-2573 or tcweng@email.unc.edu, or my thesis advisor, Dr. Diane Groff, at 919-962-0534 or groff@email.unc.edu.

All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

I appreciate your time and participation

APPROVED
Behavioral IRB, UNC-Chapel Hill
from 11/17/05 to 11/17/06

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