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Zachary J. Burt

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**THE PREFERENCES OF EXERCISE AND PHYSICAL ACTIVITY IN  
INDIVIDUALS WITH AN INTELLECTUAL DISABILITY**

A Masters Thesis

Presented to

The Graduate College of  
Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Health Promotion and Wellness Management

By

Zachary J. Burt

July 2016

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# **THE PREFERENCES OF EXERCISE AND PHYSICAL ACTIVITY IN INDIVIDUALS WITH AN INTELLECTUAL DISABILITY**

Kinesiology

Missouri State University, July 2016

Master of Science

Zachary J. Burt

## **ABSTRACT**

The purpose of this study was to explore the preferences of exercise and physical activity in individuals with an intellectual disability. It took place during Bear Play, a physical activity program geared towards working with individuals with a disability at Missouri State University. This project was facilitated through the partnership of Missouri State University's Kinesiology department and the Arc of The Ozarks. A convenience sample was drawn from individuals participating in the program during the 2015-2016 academic year. Each participant was asked to complete a survey. Data were collected by using a survey administered on an IPAD and covered many activities under the topics of anaerobic exercise, aerobic exercise, flexibility activities, sport activities, and recreational activities. Using descriptive statistics, only a slight difference was found between preference for exercise and physical activities. Strong evidence provided support that respondents preferred participating with others in all themes represented on the survey instead of alone. These results provide practical application and considerations for program design and providing choice for individuals with an intellectual disability.

**KEYWORDS:** exercise, intellectual disability, participation, perceptions, physical activity, physical activity program, preferences

This abstract is approved as to form and content

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Rebecca Woodard, PhD  
Chairperson, Advisory Committee  
Missouri State University

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# INTRODUCTION

## Overview

Physical activity and exercise are very low in individuals with an intellectual disability. It has been reported that among adults with intellectual disabilities (ID), there is existing evidence that indicates only a small proportion of adults with ID (17.5% to 33%) meet physical activity guidelines (Temple, Frey, & Stanish, 2006). Because of this, obesity and poor health problems are prevalent. This study aimed to identify preferences of different types of physical activity and exercise that individuals with ID enjoy and will potentially perform more often. If activities can be identified that could be used more frequently than others, the trends of obesity and poor overall health in this population could be reduced by increasing the amount of engagement in physical activity. Identifying these activities could provide a better starting point for other service providers when initiating a physical activity or exercise program. Due to increased barriers compared to other populations, ensuring that the effort needed to engage in physical activity is manageable and perceived as achievable is important. In addition, the higher preference for sedentary activity among the least active individuals suggests that it would be valuable to examine what attracts adults with an ID to particular physical activities and what aspects of participation they find enjoyable (Temple, 2007).

## **Research questions**

The purpose of this study was to investigate the four research questions that are outlined below.

1. What are the exercise and physical activity preferences of individuals with an intellectual disability?
2. Do individuals differ in preference for exercise versus physical activity?
3. Do individuals prefer to engage in exercise and physical activity alone or with others?
4. Are there gender differences in preference and engagement type between males and females?

## **Delimitations**

This study's main focus was to explore the preferences of individuals with ID in regards to their engagement in exercise and physical activity. Delimitations in this study begin with the participants. Participants included a convenience sample of 20 individuals diagnosed with ID who engage in exercise and physical activity. Since prevalence rates of inactivity are high in all ages of this population, recruiting from a convenience sample population was attempted in order to achieve a representative sample. Inclusion criteria for the participants included:

1. Diagnosis of ID by psychologist or clinical professionals.
2. Participation in MSU Kinesiology department and the Arc of The Ozarks sponsored physical activity or exercise program Bear Play.
3. Minimum 18 years of age.

## **Limitations**

This study was limited by the following factors:

1. Time commitment for research and participants.
2. Participants had control of exercise and physical activity outside of study.
3. Participants recruited may not be accurately represented for the desired population of study.
4. Survey only allows them to answer with provided preferences, the true preferences for individuals may not be found or represented in the survey.
5. Self-reporting of survey.
6. Positive or negative associations with physical activity and exercise constantly change.
7. All individuals are from Missouri.

## **Assumptions**

This study was based upon the following assumptions:

1. Participants accurately and truthfully answered the self-report survey that was given.
2. Participants engaged in physical activity and exercise.
3. Participants accurately identified positive and negative preferences.

## **Definitions**

Aerobic Exercise - Exercise to improve the ability of circulatory and respiratory systems to supply oxygen to body.

Anaerobic Exercise - Exercise to improve the ability of muscles to exert force and to continue to perform without fatigue.

Bear Play - A structured program tailored for the purpose of offering access for individuals to engage in exercise and physical activity here at Missouri State University in the department of Kinesiology.

Exercise - type of physical activity consisting of planned, structured, and repetitive bodily movement done to improve and/or maintain one or more components of physical fitness (Pescatello, Arena, Riebe, & Thompson, 2013).

Flexibility Training - Program to develop range of motion at a joint.

Intellectual Disability (ID) - Embraces a broad range of impairments involving general mental abilities that impact adaptive functioning in three domains of conceptual, social, or practical.

Participation - Participant has attended at least one session of the physical activity program prior to survey administration.

Physical Activity - Any bodily movement produced by the contraction of skeletal muscle that results in a substantial increase in caloric requirements over resting energy expenditure (Pescatello, Arena, Riebe, & Thompson, 2013).

Preferences - An identified greater liking for one alternative over another or others.

Recreational Activity - Voluntary activities done for pleasure on a regular basis.

Sport Activity - Competitive physical activity or games governed by a set of rules.

### **Significance of the Study**

The significance of this study was to begin to establish trends of physical activity and exercise engaged in by individuals with an ID. If trends can be identified, service providers can use the findings as a resource that could contribute to increasing

participation in physical activity and exercise. These trends can help identify which activities provide more enjoyment and can be used as a guideline to prescribe activities for increased participation. Service providers can use this information to provide a better structure to new participants of physical activity and exercise programs. It can also identify important activities that have low or negative preferences that could be modified or changed to help increase preferences of these activities. If trends can be identified, it could lead to greater physical activity and exercise levels which can result in better physical health, reducing the large trends of obesity and physical activity in individuals with an ID. By increasing physical activity and exercise, therefore reducing high sedentary levels, the overall quality of life in this population can be enhanced.

## **LITERATURE REVIEW**

This review of the literature provides an in depth view of the benefits of physical activity and the negative implications of not engaging in physical activity in individuals with an ID. There are few studies that have been conducted that aim to identify the preferences of physical activity in this population. A summary of this literature is presented according to the following areas; health outcomes for individuals with an ID, physical benefits of exercise programs for individuals with an ID, psychological benefits of exercise programs for individuals with an ID, choice of activity in a physical fitness program, barriers of physical activity in individuals with an ID, and theoretical foundations.

These themes were chosen in the review of literature due the topics being most frequently included in the current and past research studies. These are common modes of investigating topics of exercises and physical activity. These areas were chosen due to the influence they play in exercise prescription research and participation in physical activity programs.

### **Health outcomes for individuals with an intellectual disability**

Physical activity is a key aspect to overall quality of life in all individuals. It can provide many positive health benefits such as reduced stress, weight management, energy, and an increase in self-confidence. Individuals with an ID have been reported to achieve far less physical activity compared to individuals without an ID. Previous research of physical activity among adults with ID states that existing evidence indicates

only a small proportion of adults with ID (17.5% to 33%) meet physical activity guidelines (Temple et al., 2006). This has led to many negative health outcomes in this population. A review of death certificates suggested that individuals with ID live, on average, 15 years less than do other individuals (Glover & Ayub, 2010). Furthermore, self-appraisal of health status reported the epidemiological data that a mere 5% of individuals with cognitive disabilities described themselves as having an excellent health status, far less than that reported by 30% of persons without disabilities (Reichard, Stolzle, & Fox, 2011). Due to the low health status of this population due to sedentary lifestyle and poor diet, this group experiences high rates of chronic diseases associated with insufficient physical activity contributing to increased premature and preventable morbidity (Beange, McElduff, & Baker, 1995; Draheim, Williams, & McCubbin, 2002).

Health disparities affecting individuals with ID are a critical public health concern. A growing body of literature has indicated that, compared to the general population, individuals with ID experience disproportionate rates of many disease states, including but not limited to arthritis, asthma, cardiovascular disease, diabetes, periodontal disease, and gastrointestinal conditions (Anders & Davis, 2010; De Winter, Magilsen, van Alfen, Willemsen, & Evenhuis, 2011; Haveman et al., 2010; Khocht, Janal, & Turner, 2010; Reichard, Stolzle, & Fox, 2011). Interventions that aim to increase physical activity in this population are needed to help improve physical fitness in this population. Identifying activities that individuals with an ID is the first task to help increase physical activity levels. If someone enjoys an activity they are more likely to continue engaging in that activity as well as engage in it for a longer duration of time. By identifying what

individual's activity preferences are, service providers can begin to use the information as a guideline to help find other similar activities that they would also adhere to.

### **Physical benefits of exercise programs for individuals with an intellectual disability**

The substantial evidence for a lower level of fitness in people with ID suggests that this population's engagement in physical activity must increase. For more than 30 years, experimental studies have investigated the effects of exercise on individuals with ID (Shin & Park, 2012). Researchers have reported that exercise training induces positive changes in cardiovascular fitness (Rimmer, Heller, Wang, & Valerio, 2004), muscular strength (Suomi, 1998), body composition (Prommering, Brose, Randolph, Murray, Purdy, Cadamagnani, & Foglesong, 1994), and performance (Mann, Zhou, McDermott, & Poston, 2006). These findings show that there are many positive benefits to be gained by individuals with an ID who participate in a physical activity program. A study by Wu et al. (2010) found that after a six-month intervention using a healthy physical fitness program that there were statistical decreases in weight, BMI score, BMI category, and positive improvement in V-shape sit and reach test, sit-up in 30 and 60 s tests. Only the shuttle run test did not improve at the post-test among people with ID. Appropriate regular physical activity will improve health behaviors and efficacy of weight management for people with ID (Wu et al., 2010). Due to the findings of multiple studies it is clear that physical activity has a positive relationship with health benefits in this population. It shows that there are many benefits to be gained with participation in physical activity and physical activity programs.



## **Psychological benefits of exercise programs for individuals with an intellectual disability**

There are also many psychological effects to be gained from individuals with an ID participating in a physical activity program. Psychosocial benefits of physical activity may be most beneficial when conducted in groups, especially in inclusive settings; individuals participating in community-based physical fitness programs reportedly enjoyed learning how to play new sports, maintaining social contact with others, and receiving social praise and acknowledgment from those without a disability (Lante, Walkley, Gamble, & Vassos, 2011). The clear benefits of regular physical activity are recognized to the show that increasing intensity and frequency of physical activity would be the best way to improve overall health of persons with ID (Blick, Saad, Goreczny, Roman, & Sorenson, 2015; Carraro & Gobbi, 2012; Robertson et al., 2000). Due to both the physical and psychological effects shown in participating in a physical activity program these programs need to be emphasized and an increase in participation is needed in this population.

## **Choice of activity in a physical fitness program**

Individuals with an ID often make choices with the assistance of caregivers. In some instances individuals with an ID do not have control over their activity choices. Due to a collaboration of deciding choice, motivating both the individual and the caregiver on the importance of physical activity is needed to improve the adherence of participation in these programs. Regular contact between caregivers and residents is an opportunity to support healthy behaviors in an everyday context, where both caregivers

and residents can be actively involved (Marshall, McConkey, & Moore, 2003).

Identifying activities that each participant would choose or not choose is important in the long term adherence of a physical activity program. If you do not enjoy something you are less likely to continue participating in that specific activity. By identifying what activities each participant prefers service providers can begin to identify trends that could lead to both increased participation and enjoyment in a physical activity program.

### **Barriers for physical activity in individuals with an intellectual disability**

There are many barriers to this population when it comes to attaining the recommended amount of physical activity. Studying barriers is an essential starting point to the implementation of successful physical activity programs for people with an ID. Some barriers to physical activity such as social support, physical environment factors, and cost are common to both populations (Bodde & Seo, 2009). Barriers unique to people with ID such as the need for tangible supports, transportation, knowledge of opportunities, and affordability are especially important to target in health promotion efforts for this population (Bodde & Seo, 2009). By identifying what activities individuals in a program prefer to engage in service providers can begin to establish a more meaningful starting point in physical activity programming. There is a large need to increase the physical activity this population receives. Finding activities that not only remove unique barriers to this population but provide strong support can allow for service providers to begin to attempt to increase the physical activity in this population. Allowing for choice is vital in all programming but is especially unique in this group of individuals. Establishing preferences and trends that individuals enjoy can help to lead participants to

find other activities they may enjoy or prefer to do as well and lead to many physical and psychological benefits.

### **Theoretical Foundations**

A theoretical model that explicitly incorporates some individual-level and environmental influences is the Behavioral Choice Theory (Rachlin, Kagel, & Battalio, 1980). Access is conceptualized as the amount of work or effort needed to engage in the behavior. Other studies have pointed out that when the ‘cost’ of access is equal for active and sedentary alternatives, people will engage in activities they find the most reinforcing. When reinforcement for active and sedentary activities is equal, people generally participate in the behavior with the least ‘cost’, i.e. the most accessible (Epstein & Roemmich, 2001). Behavioral choice theory incorporates some environmental individual level influences. The theory posits that the decision to be active or sedentary is based in part on access to sedentary and active alternatives and the reinforcing value of those alternatives (Epstein & Roemmich, 2001). Access in behavioral choice theory is the stated concept of how much work is needed to participate in the behavior. By using this theory, this study can theorize that the individuals will choose the activities they find to have the least cost associated in the engagement of that activity. If the cost of the activity is too high the individuals will most likely choose not to participate in that activity and will engage in another.

A study by Temple et al. (2006) explored the determinants of physical activity in a study of 37 adults with ID. Step counts measured by a pedometer were correlated with barriers, enjoyment and preferences. Using the three tenets of the Behavioral Choice

Theory she found that barriers to physical activity and preference for sedentary behavior were significantly correlated with lower step count the sedentary groups identified different barriers than the active groups (Bodde & Seo, 2009).

Finding activities that have a low cost associated with them, while still allowing for participation in physical activity is needed. If we can increase the amount of activity individuals receive while keep the cost of the individuals activities low ,we can expect to see more participation in physical activity programs leading to the desired benefits of achieving more physical activity. A study found that a good adoption and adherence to a physical activity program for older adults with cognitive and physical functional disabilities were found when they specifically designed the program to create the perception of fun rather than work (Podgorski, Kessler, Cacia, Peterson, & Henderson, 2004). This could be due to the association of the low cost of fun perceived activities, compared to the high perceived cost of work activities.

## **METHODS**

This study was conducted to describe the preferences of physical activity in individuals with an ID. This chapter includes information on the participants, instruments, procedures, data collection and statistical design/analysis.

### **Sampling Procedure**

Sampling procedures began with the convenience sample which was obtained through the partnership of Missouri State University Kinesiology department and the Arc of the Ozarks in Springfield Missouri. A survey was administered using an IPAD with survey monkey software. Surveys were kept confidential during the whole process. The survey itself included a variety of exercise and physical activities which had been grouped into five main activity themes. The themes included aerobic exercise, anaerobic exercise, flexibility activities, sport activities, and recreational activities. The participant then identified verbally or by pointing to the appropriate diagram as to whether they prefer engaging in that activity or if they did not prefer to engage in that activity. The principle investigator assisted participants in completing the survey using an IPAD. The time needed for the completion was approximately 10 minutes.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable. Prior approval for this project was obtained from the Missouri State University Institutional Review Board on April 6, 2016: IRB approval #16-0380). The parent or guardian of each

individual received and signed the informed consent form. Each participant received and assigned an assent form that outlined the project. Participation in this study was voluntary. If at any time a participant felt uncomfortable answering the survey, they could stop the survey without consequence and no response were recorded for that individual. Complete confidentiality of the results were maintained. No names or personal identification were used in reporting this study to interested persons. HIPAA guidelines and criteria were followed as directed by the Arc of the Ozarks established HIPAA procedures.

### **Survey Measures**

The Burt Preferences of Exercise and Physical Activity Survey that was given to the participants of the Bear Play program was a picture survey uploaded on survey monkey, a website tailored to collecting data in survey format. It had pictures of activities that fall under the five themes of aerobic exercise, anaerobic exercise, flexibility activities, sport activities, and recreational activities. In Bear Play these five themes account for the majority of the activities the participants engaged in.

The survey was non-validated survey and was created by the primary investigator that reflected the main activities that individuals engage in during Bear Play. The pictures used were divided into themes of each type of exercise and had multiple pictures per question to help clearly show what activities reflect the exercises. The question breakdown for aerobic exercise theme were walking and running for cardio, and biking for fitness. The question breakdown for anaerobic exercise were resistance machines for chest, shoulder, and triceps muscles; resistance machines for back muscles; resistance

machines for leg muscles; resistance training with cable machines; resistance training with barbells, resistance training with dumbbells, body weight leg exercises; body weight upper body exercises; and body weight core exercises. The question breakdown for the flexibility theme were upper body flexibility training, lower body flexibility training, and yoga activities for flexibility. The question breakdown for the sport theme were basketball, volleyball, baseball/softball, racket sports, and soccer. The last question breakdown of the theme recreational activities included kickball, and catching and throwing of different kinds. These questions were chosen due to these being the most basic modalities practiced in the Bear Play which were observed by the principal investigators.

The survey began with an indication question asking if the participants had been to the Bear Play program at least one time in the 2015-2016 academic year. If the answer was “yes” the survey began and asked if they were male or female. It then displayed pictures of activities under the identified themes. The participants either indicated if they preferred that activity or if they did not prefer the activity by answering “yes” or “no”. If the individual had shown to prefer the activity the survey had a built in logic loop that would then ask if they enjoyed the activity “alone” or preferred to do it “with others”. This was asked to start to identify if there were activities the individuals preferred to do in a group. Due to a delay in social understanding and interaction establishing activities that can be done in a group could lead to improving social interaction in this population. There was also a modified survey which had a smiley face for “yes” and a sad face for “no”. It had a picture of a single individual, and a picture of a group of people for the “alone or “with others” questions. This was used for non-verbal individuals in the Bear

Play program to help make sure the question very clearly understandable and so the primary researcher and get the most accurate answer for each individual.

### **Data Collection**

The target sample was composed of various individuals with an intellectual disability from Southwest Missouri currently participating in Bear Play at Missouri State University. The survey was completed by 20 individuals with an ID from the Arc of the Ozarks in order to appropriately detect a significance and identify patterns. Out of the 20 participants completing the survey, 13 were male and 7 were female. Participants were between 18 and 65 years old with a mean age of 36. A convenience sample was drawn from the participants of Bear Play. The participants were obtained through convenience sampling through the current partnership of the ARC of the Ozarks and the Missouri State University Kinesiology department. Data were collected by administering a survey which covered the preferences of exercise and physical activity. Preferences were measured by using a survey administered on an IPAD and covered many activities under the topics of anaerobic exercise, aerobic exercise, flexibility activities, sport activities, and recreational activities.

### **Data Analysis**

Due to the nature of this study falling under descriptive research, which involves describing current events or conditions, a survey was created. The use of surveys is one of the most common tools used for this type of research. The data analysis was used to give numerical values that described these conditions. Data were analyzed using



descriptive statistics to first identify frequencies of yes or no for each category for the type of activity themes. Frequencies of choosing yes or no were then analyzed for each individual activity and as to whether participants wanted to engage in preferred activities alone or with others.

## **RESULTS**

The purpose of this study was to investigate the preferences of exercise and physical activity in individuals with an ID. Descriptive statistics were used to answer three research questions: What are the exercise and physical activity preferences of individuals with an ID? Do individuals differ in preference for exercise versus physical activity? Do individuals prefer to participate in exercise and physical activity alone or with a group? Are there gender differences in preference and engagement type between males and females?

The results of this study were presented according to each research question. The survey was completed by 20 individuals with an ID from the Arc of the Ozarks. All of the individuals had participated in a Missouri State University sponsored exercise and physical activity program Bear Play during the past academic year. The survey was developed on Survey Monkey and administered via IPAD by undergraduate students assisting with Bear Play. Out of the 20 participants completing the survey, 13 were male and 7 were female. Participants were between 18 and 65 years old with a mean age of 36. While date of birth was not an item on the survey, each individual's age was obtained from the Bear Play program application forms completed by parents and/or guardians.

For the first research question, the survey asked participants to identify their preferred exercise and physical activity preferences. The survey was organized into five themes including aerobic exercise, anaerobic exercise, flexibility activities, sport activities, and recreational activities. Out of the 20 respondents, 85% preferred aerobic exercises such as walking or running while 80% preferred biking. For the variety of

anaerobic exercises, preference ranged from 95% to 45% with the most preferred being resistance machines for the upper body with the least preferred being training with barbells. 85% preferred flexibility activities for both the upper and lower body while only 55% preferred yoga activities. Preferred sport activities ranged from basketball (85%) to racket sports (55%). 85% preferred recreational activities such throwing and catching and 75% preferred kickball. See Table 1 for complete results for each survey item.

The second research question addressed whether participants preferred exercise or physical activity. It was clear from the responses that the least preferred activities included resistance training with barbells (45%), Yoga activities for flexibility training (55%), and playing racket sports (55%). The overall preference for all aerobic training was 83%, the overall preference for all anaerobic training was 74%, the overall preference for all flexibility training was 75%, the overall preference for all sport activities were 74%, and the overall preference for all recreation activities were 80%. The percent of all preferred exercise activities was 75%. The percent of all preferred physical activities was 76%. The data provides evidence that there is a slight difference in preference leaning towards physical activity compared to exercise activities.

For the third research question, the survey asked participants to identify their preference of engaging in an activity alone or with others. This was only asked if the individuals indicated they preferred a certain activity. Responses of “alone” or “with others” were brought upon with the logic loop that was used when an answer of “yes” to preferring a certain activity was given by a participant. Of the respondents, 17% preferred activities “alone” compared to 83% answering “with others”. Within the exercise theme

21% preferred engaging in exercise activities “alone”, compared to 79% answering “with others”. Within the physical activity theme 8% preferred engaging in physical activity “alone”, compared 92% answering “with others”. The overall preference for preferring to do aerobic activities “alone” was 21%, compared to preferring engaging “with others” 79%. The overall preference for preferring to do anaerobic activities “alone” was 22%, compared to preferring engaging “with others” 78%. The overall preference for preferring to do flexibility activities “alone” was 20%, compared to preferring engaging “with others” 80%. The overall preference for preferring to do sports activities “alone” was 9%, compared to preferring engaging “with others” 91%. The overall preference for preferring to do recreational activities “alone” was 6%, compared to preferring engaging “with others” 94%. This clearly shows that there is a large preference of participating in exercise and physical activity with others compared to doing the activities alone. See Table 1 for results for each survey item.

The fourth research addressed whether there were any gender differences between males and females in relation to preference of activity or in engagement type. Thirteen males and seven females completed the survey. The data were similar to that from the first and second research questions. A majority of both groups preferred all activities except resistance training with barbells, Yoga for flexibility, and playing racket sports. A majority of both males and females preferred to engage in activity with others. See Table 2 for results for each survey item.

Table 1. Percentages of participants who preferred each exercise and physical activity and if preferred, would they like to engage in activity alone or with others ( $N= 20$ ).

Exercise or Physical Activity	Preferred %	Engage in Activity Alone %	Engage in Activity with Others %
Resistance Machines for Chest, Shoulders, and Triceps	95% (19)	16% (3)	84% (16)
Resistance Machines for Back Muscles	75% (15)	13% (2)	87% (13)
Resistance Machines for Leg Muscles	85% (17)	18% (3)	82% (14)
Resistance Training with Cable Machines	80% (16)	19% (3)	81% (13)
Resistance Training with Barbells	45% (9)	33% (3)	67% (6)
Resistance Training with Dumbbells	70% (14)	29% (4)	71% (10)
Body Weight Leg Exercises	60% (12)	25% (3)	81% (9)
Body Weight Upper Body Exercises	75% (15)	20% (3)	80% (12)
Body Weight Core Exercises	80% (16)	31% (5)	69% (11)
Biking for Cardio	80% (16)	19% (3)	81% (13)
Walking or Running for Cardio	85% (17)	24% (4)	76% (13)

Table 1 (continued). Percentages of participants who preferred each exercise and physical activity and if preferred, would they like to engage in activity alone or with others ( $N=20$ ).

Exercise or Physical Activity	Preferred %	Engage in Activity Alone %	Engage in Activity with Others %
Upper Body Flexibility Training	85% (17)	18% (3)	82% (14)
Lower Body Flexibility Training	85% (17)	24% (4)	76% (13)
Yoga for Flexibility	55% (11)	18% (2)	82% (9)
Playing Basketball	85% (17)	12% (2)	88% (15)
Playing Kickball	75% (15)	0% (0)	100% (15)
Playing Volleyball	70% (14)	7% (1)	93% (13)
Playing Softball or Baseball	80% (16)	6% (1)	94% (15)
Playing Soccer	80% (16)	13% (2)	87% (14)
Playing Racket Sports	55% (11)	9% (1)	91% (10)
Catching and Throwing	85% (17)	12% (2)	88% (15)

Table 2. Number of males (N=13) and females (N=7) who preferred each exercise and physical activity and if preferred, would they like to engage in activity alone or with others.

Exercise or Physical Activity	Preferred		Engage in Activity Alone		Engage in Activity with Others	
	M	F	M	F	M	F
Resistance Machines for Chest, Shoulders, and Triceps	12	7	3	0	9	7
Resistance Machines for Back Muscles	9	6	1	1	8	5
Resistance Machines for Leg Muscles	11	6	3	0	8	6
Resistance Training with Cable Machines	10	6	2	1	8	5
Resistance Training with Barbells	4	5	2	1	2	4
Resistance Training with Dumbbells	8	6	4	0	4	6
Body Weight Leg Exercises	6	6	3	0	3	6
Body Weight Upper Body Exercises	9	6	3	0	6	6
Body Weight Core Exercises	11	5	4	1	7	4
Biking for Cardio	10	5	3	1	7	4
Walking or Running for Cardio	10	7	3	0	7	7

Table 2 (continued). Number of males (N=13) and females (N=7) who preferred each exercise and physical activity and if preferred, would they like to engage in activity alone or with others.

Exercise or Physical Activity	Preferred		Engage in Activity Alone		Engage in Activity with Others	
	M	F	M	F	M	F
Upper Body Flexibility Training	11	6	3	1	8	5
Lower Body Flexibility Training	11	6	4	0	7	6
Yoga for Flexibility	5	5	2	0	3	5
Playing Basketball	11	6	1	0	10	6
Playing Kickball	10	5	0	1	10	4
Playing Volleyball	9	5	1	0	8	5
Playing Softball or Baseball	11	5	1	0	10	5
Playing Soccer	9	6	1	1	8	5
Playing Racket Sports	6	5	1	0	5	5
Catching and Throwing	12	5	2	0	10	5



## **DISCUSSION**

The purpose of this study was to explore the preferences of exercise and physical activity in individuals with an ID. This information could help program leaders identify starting points for individuals when beginning an exercise program in this population. This information could help lead to not only identifying activities that individuals with an ID prefer, but also help establish a better starting point in programming prescriptions in relation to exercise.

The first question was to identify the exercise and physical activity preferences of individuals with an ID. Participants indicated that their most preferred activities were aerobic exercises, anaerobic exercises with resistance machines, overall flexibility exercises, sports activities such as basketball, and recreational activities such as throwing and catching. These results are supported by Behavioral Choice Theory (Rachlin, Kagel, & Battalio, 1980). Using this theory, Epstein and Roemmich (2001) found that individuals will choose activities they find that are most accessible and most familiar. Therefore, requiring less overall physical and psychological cost to participate. All of the exercises and physical activities mentioned above are options offered in the Missouri State University Exercise and Physical Activity Bear Play Program, so participants have already been exposed to and may already engage in them on a regular basis. The least preferred activities included using barbells for resistance training, Yoga for flexibility, and racket sports. These results also support Behavioral Choice Theory as they are not as accessible as the preferred activities and are more complex to perform. They are options in the Bear Play program but rarely do participants choose to engage in these activities.

Marshall, McConkey, and Moore (2003) found that identifying activities that individuals would choose or not choose to participate in is necessary for adherence to an exercise program. Based on anecdotal observations, the preferred exercise and physical activities that the respondents identified as preferred are what they choose to regularly participate in during the Bear Play program. The results support the assumption that identifying what individuals enjoy could lead to a more active lifestyle, which could lead to positive health effects for individuals with an ID (Reichard et al., 2011).

Findings related to the second research question indicated a slight difference in overall preference between exercise (75%) and physical activities (76%). These results are also supported by Behavioral Choice Theory (Rachlin, Kagel, & Battalio, 1980). The questions asked in the survey were chosen due to the observations by the primary investigators. Activities that have already been associated with participation in the Bear Play program were included in the survey. Selecting activities that have already been associated with participation could have contributed to the minimal difference in preference for exercise or physical activity. Research has shown that individuals participate in activities they enjoy. There is no research, however, to support whether individuals with an ID prefer exercise over physical activities. The results do support the importance of allowing individuals to select their own exercise and physical activity programs.

The third research question addressed whether participants preferred to participate in exercise and physical activities alone or with a group. The results provided strong evidence supporting that respondents preferred participating with others in all themes represented on the survey. As reported by Lante et al. (2011), individuals with

disabilities enjoyed participating in community-based physical fitness programs. With Behavioral Choice Theory (Rachlin, Kagel, & Battalio, 1980), people engage in activities they find reinforcing. The results of this study support these findings. Inclusiveness, social contact, and social acknowledgement are associated with engaging in activities with others.

Bodde and Seo (2009) noted social support as a barrier to engaging in physical activity. By recognizing the importance of inclusion and engagement with others, service providers can establish more meaningful exercise and physical activity programming.

Findings related to the fourth research question indicated that both male and female participants enjoyed participating in a majority of the exercise and physical activities, and preferred participating with others. Previous research has not specifically investigated gender differences in these areas for individuals with an ID. These results support the assumptions that enjoyment of an activity and social contact reinforce participation (Bodde & Seo, 2009; Rachlin, Kagel, & Battalio, 1980).

### **Potential Limitations**

There were several potential limitations to the current study that may have biased the responses on the survey. The survey included exercise and physical activities that many of the participants currently engage in due to their prescribed programs. While there was some choice given when developing individual programs, the programs were designed by the primary investigators. If participants were not already familiar with the items on the survey, their responses might have been different.

Similarly, participants typically exercised and were physically active with at least one other person while at Bear Play. Many of the options in Bear Play are group oriented. In addition, all participants receive services from the Arc of the Ozarks. They are roommates or friends who spend extensive time together outside of Bear Play. Each participant also has a fulltime caregiver accompanying them 24 hours a day. Since participants are used to participating in groups and having a constant caregiver in their daily lives, they might not have considered the possibility of being alone as an option that they could realistically select.

The design of the survey itself could have been a limitation. All questions were accompanied by pictures. For many categories, more than one picture was displayed. For example, under resistance machines for back muscles there were four different exercises. Preference or non-preference might have been determined based on only one, but not all of the pictures. In addition, the individual in each picture was known by all participants. Some respondents might have been less likely to prefer an activity or want to participate in a group if the individual in the photos was unfamiliar.

## **Conclusions**

The most socially valid component of this project was the design itself. In working with individuals with exceptionalities, especially those with an ID who might struggle with communication, creating opportunity for choice becomes an ethical consideration with broad implications for practice. The opportunity to make choices is central to human dignity. The sample size was small with the findings most likely not generalizable. This approach for determining preferences, however, was the most

impactful finding of this study. Within the limits of the study the following conclusions can be stated.

1. Participants indicated that their most preferred activities were aerobic exercises, anaerobic exercises with resistance machines, overall flexibility exercises, sports activities such as basketball, and recreational activities such as throwing and catching.
2. Only a slight difference in overall preference between exercise (75%) and physical activities (76%) was found.
3. Strong evidence supported that respondents preferred participating “with others” in all themes represented on the survey instead of alone.
4. Due to survey design it is clear that choice plays a major factor in what activities individuals participate in regardless of it being exercise or physical activity.
5. By incorporating technology that make administering a survey accessible and easily interpreted. Investigators are able to directly communicate with individuals without the assistance of care givers. This allows for individuals with an ID to not only speak for themselves but also contributes to the choices that are often decided for them.

### **Directions for Future Research**

The following suggestions should be considered for future research.

1. The study should be replicated with a larger sample. A larger sample size would strengthen the results and allow for generalization.
2. A study of the difference in preference by disability should be conducted. The definition of an intellectual disability in study could be broken down to more specific groups and could allow for even more data in correlation of specific disability.
3. Additional studies using other physical activity programs involving individuals with intellectual disabilities should be conducted to add a literature base.
4. The study could be replicated with a group of individuals with intellectual disabilities that are sedentary. This could add a different perspective to the preferences of exercise and physical activity.

5. A wider variety preference survey study should be administered. Using the survey built off a more robust activity pool could help identify more accurate preferences.

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## **APPENDIX**

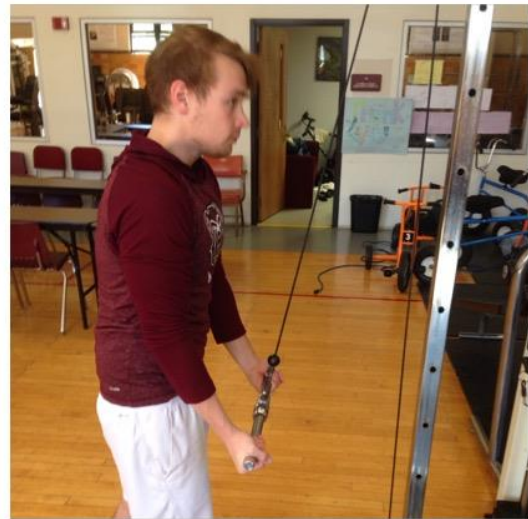
### **Burt Preferences of Exercise and Physical Activity Survey**

Have you been to Missouri State University fitness program at least once in the last year (2015-2016)?

- Yes
- No

Are you male or female?

- Male
- Female

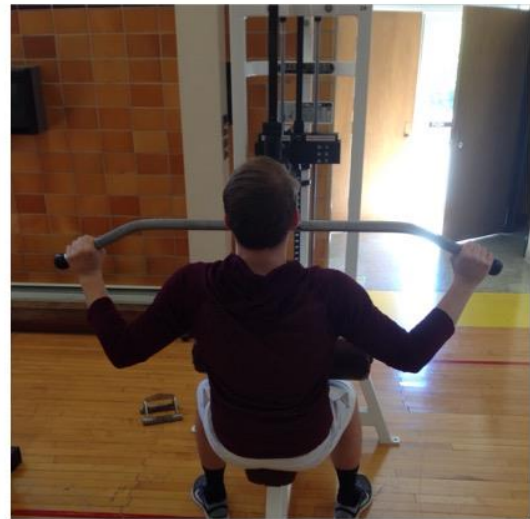
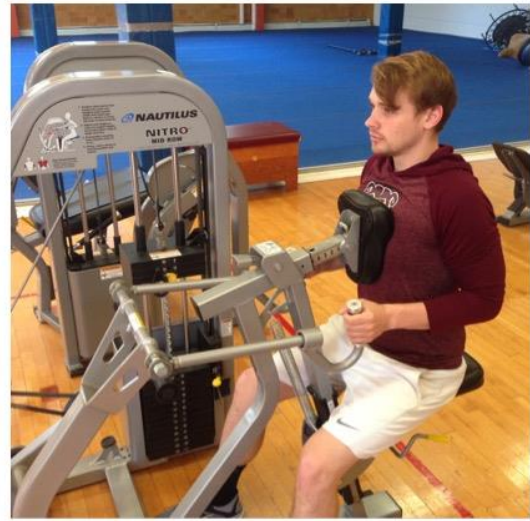


Do you enjoy resistance machines for chest, shoulders, and triceps muscles?

- Yes
- No

If yes, do you enjoy doing resistance machines for chest, shoulders, and triceps muscles alone or with other people?

- Yes
- No



Do you enjoy resistance machines for back muscles?

- Yes
- No

If yes, do you enjoy doing resistance machines for back muscles alone or with other people?

- Yes
- No



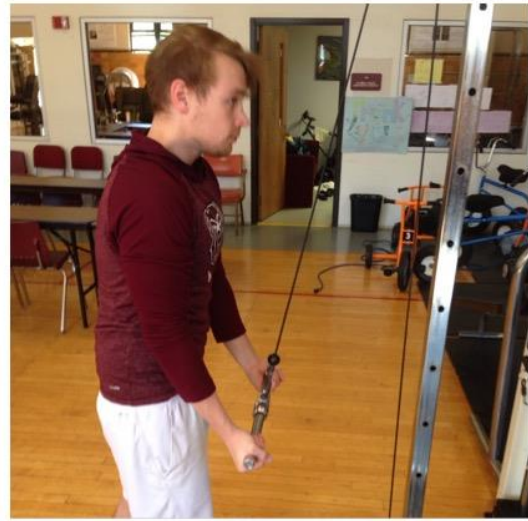
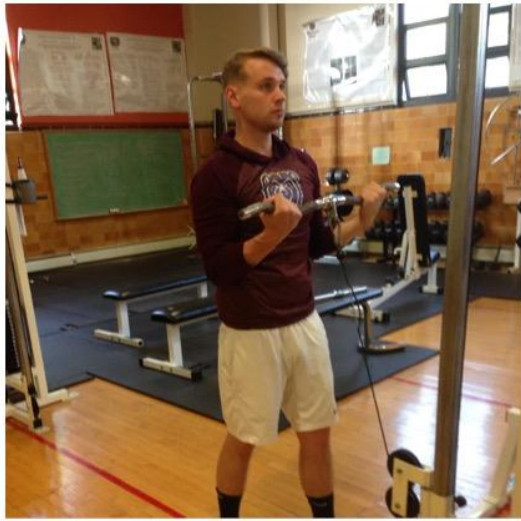


Do you enjoy resistance machines for leg muscles?

- Yes
- No

If yes, do you enjoy doing resistance machines for leg muscles alone or with other people?

- Yes
- No

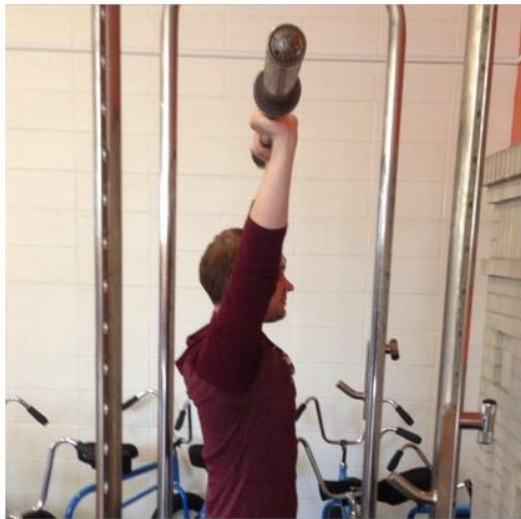


Do you enjoy resistance training with cable machines?

- Yes
- No

If yes, do you enjoy doing resistance training with cable machines alone or with other people?

- Yes
- No



Do you enjoy resistance training with barbells?

- Yes
- No

If yes, do you enjoy doing resistance training with barbells alone or with other people?

- Yes
- No





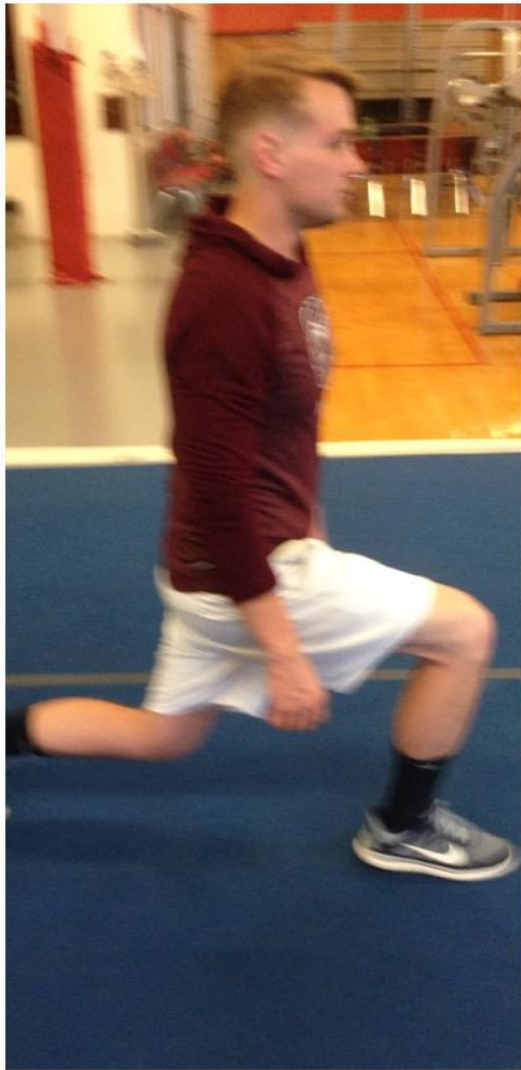
Do you enjoy resistance training with dumbbells?

- Yes
- No

If yes, do you enjoy doing resistance training with dumbbells alone or with other people?

- Yes
- No





Do you enjoy body weight leg exercises?

- Yes
- No

If yes, do you enjoy doing body weight leg exercises alone or with other people?

- Yes
- No



Do you enjoy body weight upper body exercises?

- Yes
- No

If yes, do you enjoy doing body weight upper body exercises alone or with other people?

- Yes
- No



Do you enjoy body weight core exercises?

- Yes
- No

If yes, do you enjoy doing body weight core exercises alone or with other people?

- Yes
- No





Do you enjoy biking for cardio?

- Yes
- No

If yes, do you enjoy biking for cardio alone or with other people?

- Yes
- No



Do you enjoy walking or running for cardio?

- Yes
- No

If yes, do you enjoy walking or running for cardio alone or with other people?

- Yes
- No



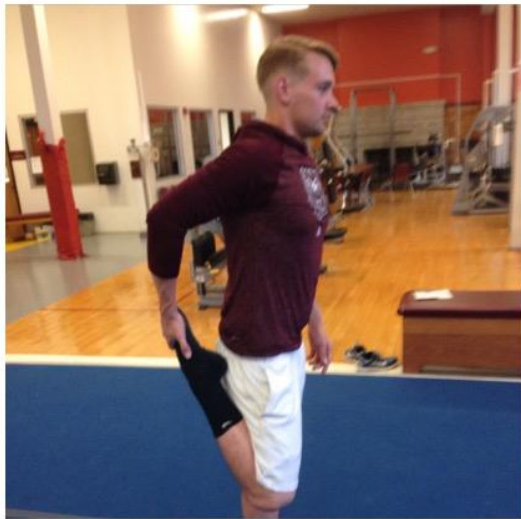
Do you enjoy upper body flexibility training?

- Yes
- No

If yes, do you enjoy doing upper body flexibility training alone or with other people?

- Yes
- No





Do you enjoy lower body flexibility training?

- Yes
- No

If yes, do you enjoy doing lower body flexibility training alone or with other people?

- Yes
- No



Do you enjoy Yoga activities for flexibility training?

- Yes
- No

If yes, do you enjoy doing Yoga activities for flexibility training alone or with other people?

- Yes
- No





Do you enjoy playing basketball?

- Yes
- No

If yes, do you enjoy playing basketball alone or with other people?

- Yes
- No



Do you enjoy playing kickball?

- Yes
- No

If yes, do you enjoy playing kickball alone or with other people?

- Yes
- No





Do you enjoy playing volleyball?

- Yes
- No

If yes, do you enjoy playing volleyball alone or with other people?

- Yes
- No



Do you enjoy playing softball or baseball?

- Yes
- No

If yes, do you enjoy playing softball or baseball alone or with other people?

- Yes
- No





Do you enjoy playing soccer?

- Yes
- No

If yes, do you enjoy playing soccer alone or with other people?

- Yes
- No



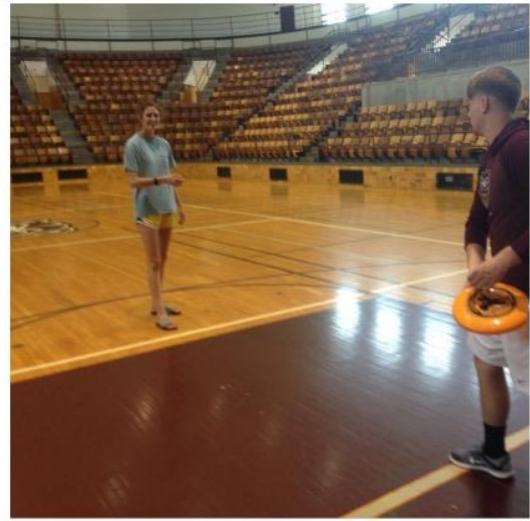
Do you enjoy playing racket sports (tennis/racquetball)?

- Yes
- No

If yes, do you enjoy playing racket sports (tennis/racquetball) alone or with other people?

- Yes
- No





Do you enjoy catching and throwing?

- Yes
- No

If yes, do you enjoy catching and throwing alone or with other people?

- Yes
- No