WHEELCHAIR BASKETBALL ATHLETES: MOTIVES FOR PARTICIPATION

by

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The purpose of this study was to examine the differences between demographic and individual player characteristics (i.e., gender, wheelchair basketball division, and individual athlete classification) and motives for involvement in adult wheelchair basketball athletes. Ninety-six wheelchair basketball players from teams in the National Wheelchair Basketball Association (NWBA), ages 18-67 years old, participated in the study. Participants completed a Qualtrics survey that collected demographic information and included the Motives for Physical Activities Measure-Revised (MPAM-R). The MPAM-R measures five different motives for participation in athletes: interest/enjoyment, competence, appearance, fitness, and social motivation. Results demonstrated a significant difference [$F_{(4,82)} = 3.118$, p=.020] between the Women's Division and the Championship Division on the competence scale (MD=0.74, p=.041), as well as a significant difference [$F_{(4,80)} = 3.665$, p=.009] between the Men's Collegiate Division and Division III on the fitness scale (MD= 0.96, p=.047). The results of this study offer some insight into motivating wheelchair basketball players and differences among various divisions in the NWBA. The results from this study may benefit recreational therapy professionals, wheelchair basketball athletes, their coaches, and professionals involved in the promotion of adapted sports.

WHEELCHAIR BASKETBALL ATHLETES: MOTIVES FOR PARTICIPATION

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by

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Introduction

Individuals with disabling conditions report having poorer health than those from the general population in the United States. Furthermore, individuals with disabling conditions are twice as likely to be physically inactive as compared to someone who does not have a disability (Altman & Bernstein, 2008). The statistics support the need for individuals with disabilities to participate in a diverse range of physical activity including adapted sports. In order to promote the participation of persons with disabilities in sport and physical activity, it is essential to understand their motivation and interest in engaging in an activity.

Self-Determination Theory (SDT) offers one theoretical concept for understanding an individual's motivation for engaging in an activity. SDT has been widely applied throughout the study of sport to understand an individual's motivation for engaging in an activity. SDT is a motivation and personality theory that focuses on meeting the innate psychological needs of competence, relatedness, and autonomy. Competence is the need to feel effective in action and capable of meeting day-to-day challenges. Relatedness is the feeling of being connected to and belonging with others. Lastly, autonomy refers to the perception that one is the source of one's own behavior (Deci & Ryan, 2002; LaGuardia & Ryan, 2002). When these needs are met, an individual is considered to be functioning at his or her optimal level and is more likely to be intrinsically motivated.

Intrinsic motivation is the inherent tendency to seek out new experiences, to explore and learn, and to exercise one's abilities (Ryan & Deci, 2000). So if an athlete's basic needs are met, they are more likely to be motivated to continue to participate in an activity. However, an athlete may also participate in a sport because they are extrinsically motivated, which means that they are involved in an activity in order to receive tangible rewards or to avoid punishment

(Battistelli, Montani, Guicciardi, & Bertinato, 2014). If an athlete is extrinsically motivated, they are less likely to continue to participate in an activity because the activity is a means to an end. An extrinsically motivated individual is not experiencing feelings of competence or autonomy (Frederick-Recascino, 2002). It is important that athletes' basic needs are met and that they are intrinsically motivated so that they continue to participate in sport. Adapted sports provide immense benefits to those that participate; however, these benefits will never be attained if an athlete is not continually motivated to participate.

Benefits of Adapted Sports Participation

The research literature demonstrates vast benefits of adapted sports (Hanson, Nabavi, & Yuen, 2001; Price, Davidoff, & Balady, 2000; Wilhite & Shank, 2009), and the benefits may have lifelong implications for participation. Compared to people without disabilities, many individuals with disabling conditions have a lower quality of life, limited community integration, and poorer health (Yazicioglu, Yavuz, Goktepe, & Tan, 2012). When persons with disabling conditions participate in adapted sport, it gives them opportunities to address the negative impacts of their disabilities.

Adapted sports are activities that involve physical exertion and the use of specific physical skills. Researchers have documented that involvement in adaptive sports can significantly improve the quality of life, community integration, and health of the participants. Individuals with disabilities who engage in sports have greater peer relations and increased social interactions than those who do not engage in adapted sports (Blinde & McClung, 1997; Shapiro & Martin, 2010). These same individuals experience enhanced independence, a more positive view of themselves, feelings of empowerment, and motivation for continued engagement (Hanson et al., 2001; Giacobbi, Stancil, Hardin, & Bryant, 2008). Additionally, involvement in adapted sports has been demonstrated to encourage engagement in meaningful life activities and

roles (Wilhite & Shank, 2009). Physiologically, athletes who participate in adapted sports have increases in maximum oxygen uptake, ventilatory threshold, and other signs of aerobic fitness (Abel, Platen, Rojas Vegas, Schneider, & Struder, 2008; Leicht., Bishop, & Goosey-Tolfrey, 2012; Price et al., 2000).

Given the benefits of engagement in adapted sports, it is important to promote active participation among individuals with disabling conditions. Therefore, it is essential to understand what factors influence an individual's participation, as an individual's participation may be motivated by a combination of intrinsic and extrinsic rewards (Wilhite & Shank, 2009).

Currently, however, there is limited research that examines what motivates wheelchair and adapted sport athletes to participate in a given sport. Understanding what motivates these athletes is important because it can relate to adherence, attitudes associated with the sport, and well-being (Frederick & Morrison, 1996; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). In most of the research on motives for activity participation, the respondents were from the general population and engaged in university or fitness health center settings. There is very little research on motives for participation for individuals involved in adapted sports. This study addresses part of the gap in the literature to understand what motivates these athletes to continue to participate in the sport of wheelchair basketball.

Purpose of the Research

The purpose of this study was to determine the differences between individual player characteristics and motives for involvement in adult wheelchair basketball. For this study, adult wheelchair basketball athletes were those who are 18 years or older. While there are multiple motivations for an athlete's participation in competitive wheelchair sports competition, determining the differences between individual characteristics and motivation may aid in

engaging others to participate in sports. The goal of this study was to examine the differences between scores on the motivational subscales of the MPAM-R and select characteristics of wheelchair basketball athletes. This study examined the following research questions:

1.0 Is there a difference between the means of the five scales of the Motives for Physical Activities Measure-Revised (MPAM-R) and gender?

2.0 Is there a difference between the means of the five scales of the MPAM-R and the five different divisions examined in the National Wheelchair Basketball Association (NWBA)?

3.0 Is there a difference between the means of the five scales of the MPAM-R and the eight individual athlete classifications?

Methodology

Participants for this study were selected based on their involvement in competition sponsored by the NWBA. Team representatives (coaches) were contacted by email and asked to facilitate team member participation in the study. Teams that agreed to participate in the study were sent a Qualtrics survey link via the team representative. The Qualtrics survey consisted of demographic questions and the MPAM-R scale.

Sampling and Sampling Technique

All participants were 18 years or older and members of the NWBA. Participation was voluntary and the participants were not required to fill out the Qualtrics survey. The NWBA is comprised of over 200 wheelchair basketball teams within seven different divisions and twenty-two conferences (NWBA, 2016).

Of these seven divisions, participants from five of the divisions, Division III, Women's Division, Men's Collegiate, Women's Collegiate, and the Championship Division, were contacted. The two divisions omitted were the Junior Prep Division and the Junior Varsity Division. These two divisions were not included because individuals on these teams are not all at least 18 years of age.

Individual wheelchair teams were identified through the NWBA registry of teams. In order to secure an adequate and representative sample, the study solicited representation in the following manner. A convenience sample was used for the Women's Division and the Women's Collegiate Division in which all teams were sampled (nine teams in the Women's Division and four teams in the Women's Collegiate Division). All teams were included in order to create a comparable sample size to ensure representation and statistical power. Stratified sampling was used for teams in the Championship Division, Division III, and the Men's Collegiate Division. In

the Men's Collegiate Division, 5 out of 9 teams were contacted; in Division III, 39 out of 78 teams were contacted; and in the Championship Division, 15 out of 29 teams were contacted (See Table 1).

To ensure adequate representation by division, teams in Division III, Men's Collegiate, and Championship teams were assigned a number. Individual teams were then selected using a random numbers chart. Once a team agreed to participate, the coach or team representative was sent the Qualtrics link. One team from Division III declined to participate, so the next team was contacted and invited to participate.

Table 1.
Sampling Technique

Division	Number of Teams	Number of Teams Sampled	Percentage of Teams Sampled
Women's	9	9	100%
Men's Collegiate	9	5	56%
Women's Collegiate	4	4	100%
Division III	78	39	50%
Championship	29	15	52%

Membership in each division was determined by division criteria. To be a member of a collegiate team, an individual must be in college and be a member of the associated team. The Championship Division provides the highest level of competition and is open to both men and women whereas the Women's Division is a league devoted to women only. Lastly, Division III is a recreational level league that is open to novice or inexperienced players or those who cannot participate in a different league due to financial or geographic limitations (NWBA, 2016).

Instrumentation

The study used an electronic questionnaire that includes demographic information and the MPAM-R scale. These questionnaires were emailed as a Qualtrics survey to the individual

team members of each team that agreed to participate. Before an individual could begin the survey, they had to agree to consent to participate in order to proceed to the survey questions.

Participant Information. To generate a profile of respondents, demographic information and data on participant characteristics were collected. Information on the gender, age, individual wheelchair basketball player classification (1.0-4.5), number of years of involvement in the sport, frequency of participation, the number of sports in which the athlete engages, and the wheelchair basketball division (Division III, Championship Division, Women's Division, Women's Collegiate, and Men's Collegiate) were recorded for comparisons.

Athlete individual classifications are divided into four major classes, one through four, with half classes for exceptions that do not fit exactly into one class. These classes are based on trunk movement, rotation, and players' abilities in terms of their basketball skills (Gil-Agudo, Ama-Espinosa, & Crespo-Ruiz, 2010). Athletes classified as a 4.5 have minimal functional limitation whereas an athlete with a classification of 1.0 has the highest level of functional limitation.

Motives for Physical Activities Measure-Revised (MPAM-R) Scale. The MPAM-R scale was used to determine motivation for involvement. The MPAM-R consists of 30 items with a Likert type scale of 1 to 7, with 1 meaning not at all true for me and 7 meaning very true for me (Ryan et al., 1997). The MPAM-R measures five different motives for participation: interest/enjoyment, competence, appearance, fitness, and social motivation. Previous research demonstrated that the scales of interest/enjoyment, competence, and social motivation tend to correlate with intrinsic motivation whereas the scales of fitness and appearance are more likely to be associated with extrinsic motivation. There is no calculated total motivation score; instead, the separate scores of each subscale are averaged and compared to determine the stronger

motivators. Higher average scores demonstrate the greater importance of a motive. Past measures of internal consistency indicate adequate reliability for each subscale as Cronbach's alpha scores ranging from 0.78 to 0.92 (Ryan et al., 1997). Satisfactory construct validity is confirmed by moderate correlation with psychological constructs of autonomy, competence, and relatedness (Wilson, Rodgers, & Fraser, 2002).

Data Collection Procedures

Once teams and individual athletes were identified, a modified Dillman Total Design Method for electronic surveys was employed as a means to increase response rates. Each team was contacted, informed of the research, and asked to participate. The initial contact was considered the pre-notice. In the second step, each team was sent the survey. Based on the needs of the NWBA, the second step was employed one week following the pre-notice. A week after the initial contact, a representative of the NWBA sent a follow-up email with the link to the survey to the teams and team members that explained the study was reviewed and approved by the NWBA. The contact from the team representative served as a reminder and also included the survey for those who had not received the survey. One week after the NWBA follow-up email, a final email containing the link to the survey was sent to all participating team members. Based on past research, this survey delivery model has demonstrated quicker return times when compared to surveys that were mailed (Schaefer & Dillman, 1998). The process of the Dillman Total Design Method for electronic surveys was slightly modified by extending the time between sending emails at the request of the NWBA.

Analyses and Results

To explore the motives of wheelchair basketball, several analyses were performed. The research questions were tested using descriptive and statistical testing. Descriptive frequencies were used to create a profile of the sample.

A 't'-test examined if there were differences between the means of the five different scales (interest/enjoyment, competence, fitness, appearance, and social) of the MPAM-R and gender. Analysis of Variance (ANOVA) was performed to see if there were differences between the means of the five different scales of the MPAM-R and the five different divisions of wheelchair basketball. Lastly, a second ANOVA was completed that compared the means of the different scales of the MPAM-R and the eight different individual classifications of the wheelchair basketball athletes.

The study used mean item scale scores in analysis. Adding the scores of the items associated with each scale and then dividing the total by the number of questions calculated the means for the five scales of the MPAM-R. For example, there are seven questions that measure competence. The scores of these seven questions were added together and then divided by seven in order to give an average for the competence scale. This was calculated for each individual and for each scale.

Participant Information

The participant information collected offered a profile of the study participants. Included in participant information was age, gender, individual wheelchair basketball classification, NWBA team division, number of years playing wheelchair basketball, number of sports participated in outside of wheelchair basketball, and the frequency of wheelchair basketball participation.

There were 96 individuals who responded to the survey and the majority of the respondents were male (61.5%) with ages ranging from 18-67 years (*M*= 29.40, *SD*= 10.34). The majority of respondents were from the Division III league (42.7%), with the other divisions having similar numbers of respondents (Women's Collegiate- 13.5%, Men's Collegiate- 12.5%, Championship- 13.5%, and Women's- 8.3%). The individual classifications of the respondents were spread out among the eight different classifications. The most reported classification was 3.0 (19.8%) and the least reported individual classification was 4.0 (4.2%). The majority of participants have played wheelchair basketball for 1-3 years (21.9%) or for 10 years or more (28.1%). The last piece of information collected data on how many months of the year the respondents participated in wheelchair basketball. Almost half of the athletes (47.9%) participated between 9-12 months of the year (See Table 2).

Table 2.
Demographic Information of NWBA Wheelchair Basketball Athletes (N=96)

Question	*N*	%	*M*	*SD*
Age			29.40	10.34
Gender				
Male	59	61.5		
Female	26	29.2		
Wheelchair Basketball Division				
Championship	13	13.5		
Division III	41	42.7		
Women's	8	8.3		
Men's Collegiate	12	12.5		
Women's Collegiate	13	13.5		
Individual Classification				
1.0	9	9.4		
1.5	5	5.2		
2.0	13	13.5		
2.5	12	12.5		
3.0	19	19.8		
3.5	11	11.5		
4.0	4	4.2		
4.5	12	12.5		
Number of Years Involved in Wheelchair Basketball				
Less than a year	8	8.3		
1-3 years	21	21.9		
4-6 years	17	17.7		
7-9 years	15	15.6		
10 years or more	27	28.1		
Frequency of Participation				
0-3 months	3	3.1		
3-6 months	13	13.5		
6-9 months	26	27.1		
9-12 months	46	47.9		
Number of Sports Engaged in Other than Wheelchair Basketball				
0	30	31.3		
1	26	27.1		
2	20	20.8		
≥3	11	11.5		

Differences Between Motives for Participation and Gender

A t-test was used to test if there was a difference between gender and the five different scales of the MPAM-R. No significant differences were found between the five motives for participation and gender (See Table 3).

Table 3.
Differences between gender and motives for involvement

	Men		Women		*p*
	M	*SD*	*M*	*SD*	
Interest/Enjoyment Scale	6.217	0.720	6.006	0.648	0.419
Competence Scale	6.181	0.805	5.862	0.929	0.790
Appearance Scale	4.534	1.536	4.590	1.360	0.293
Fitness Scale	5.902	1.019	5.814	0.899	0.465
Social Scale	4.921	1.001	5.385	0.800	0.297

Differences Between Motives for Participation and Wheelchair Basketball Division

An ANOVA tested if there were any differences between the different divisions in the NWBA and the five scales of the MPAM-R. Two significant differences emerged. For the competence scale, there was a significant difference [$F_{(4,82)} = 3.118$, p=.020] between groups. Scheffe's post hoc tests demonstrated differences between the Women's Division and the Championship Division (*MD*= 0.74, p= .041) (See Table 4). The other significant difference was on the fitness scale [$F_{(4,80)} = 3.665$, p=.009] between the Men's Collegiate Division and Division III (*MD*= 0.96, p= .047) (See Table 5).

Table 4.
Differences between Motives for Involvement and Division on the Competence Scale

Division	*M*	*SD*	*F*	*p*
Women's Division (n= 8)	5.32*	1.50		
Division III (n=38)	6.18	0.76		
Men's Collegiate (n=12)	5.81	0.99	3.118	.020
Women's Collegiate (n=13)	6.00	0.44		
Championship (n=12)	6.06*	0.85		

* indicates significant difference ($p<.05$) between Women's Division and Championship Division athletes

Table 5.
Mean Differences between Motives for Involvement and Division on the Fitness Scale

Division	*M*	*SD*	*F*	*p*
Women's Division (n= 8)	5.25	0.94		
Division III (n=40)	6.11*	0.76		
Men's Collegiate (n=12)	5.15*	1.21	3.665	.009
Women's Collegiate (n=13)	6.02	0.88		
Championship (n=12)	6.07	1.06		

* indicates significant difference ($p<.05$) between Division III and Men's Collegiate Division athletes

Differences Between Motives for Participation and Individual Classification

An ANOVA was used to test if there were any differences between the eight different individual classifications and the five scales of the MPAM-R. No significant differences were found among the individual classifications and the MPAM-R scales. To expand the inquiry, the individual classifications were collapsed into four classifications instead of eight and tested for differences. The half classes (1.5, 2.5, 3.5, and 4.5) were combined with the whole number classes associated with them. This yielded the same results with no significant differences (See Table 6).

Table 6.
Mean Differences between individual classification and motives for involvement

Scale	*df*		*F*	*p*
	Between groups	Within groups		
Interest/enjoyment scale	7	70	1.075	.388
Competence scale	7	73	0.759	.623
Appearance Scale	7	70	0.772	.613
Fitness Scale	7	75	0.738	.641
Social Scale	7	72	0.755	.626

Discussion and Implications for Future Research

In an effort to understand the motives of wheelchair athletes, this study examined the differences between scores on the motivational subscales of the MPAM-R and select characteristics of wheelchair basketball athletes. There were limited findings of significance; two significant differences were identified. There were statistically significant differences between player divisions and the MPAM-R scale results.

The first difference was between the Championship Division and the Women's Division on the competence scale. The Championship Division had a significantly higher score on the competence scale than the Women's Division. Previous research has demonstrated that individuals who participate in the sport as compared to general fitness tend to have greater levels of competence and interest/enjoyment (Ryan et al., 1997; Frederick-Recascino & Schuster-Smith, 2003). While both groups participated in wheelchair basketball, the Championship Division generally represents a more elite athlete than the other divisions. Based on the findings, the Championship Division had high scores on the competence scale.

As noted in the literature, competence is an intrinsic motivator and it is considered important in order for an individual to continue to participate in an activity (Ryan et al., 1997). The results suggest that the more elite the athlete, the higher they will rate in competence. The findings have implications for the provision of opportunity for all levels of adapted sport engagement, particularly with female athletes. Recent policy efforts by the U.S. Department of Education seek to increase opportunities to engage in competitive sports at the secondary school level for students with disabling conditions (Galanter, 2013). One recommendation is to expand the opportunities for individuals with disabling conditions to develop skills for sports engagement. It is through such efforts that the individual with a disabling condition may be able

to develop the competence to engage in adapted sport activities at an elite level of performance. The results also have implications for access and opportunity from other service providers. In concert with the school system, community parks and recreation programs may consider expanding opportunities for children, youth, and adults with disabling conditions to engage in adapted sports. Adapted sports clubs may also have a role.

Based on the findings in this study, an area of future research would be to explore ways to intrinsically motivate women in the Women's Division to continue to participate. This might include workshops and training for the coaches that focus on different motivational approaches, specifically those that stress intrinsic motivation for the athletes.

Previous research has examined if supportive coaching behavior could promote an athlete's basic psychological needs (Adie, Duda, & Ntoumanis, 2008; Álvarez, Balaguer, Castillo, & Duda, 2009; Banack, Sabiston, & Bloom, 2011). Specifically, the practice of autonomy supportive coaching has been shown to promote basic needs satisfaction and, in turn, intrinsic motivation. Examples of autonomy-supportive coaching are providing athletes with choices, giving athletes opportunities to initiate activities, giving constructive feedback, and showing concern for the athletes both on and off of the court (Banack et al., 2011). A training for coaches could provide drills that give athletes choices and teach them how to provide constructive feedback that could foster their athletes' intrinsic motivation.

The other significant difference was between Division III and Men's Collegiate Division on the fitness scale. Division III scored significantly higher than Men's Collegiate Division, meaning that the Division III athletes were more motivated by the extrinsic motivator of fitness when compared to athletes from the Men's Collegiate Division. In this study, Division III athletes likely scored higher on the fitness scale because staying in shape was more central to

their participation; this is in contrast to the Men's Collegiate Division athletes who participated because it appealed to their sense of competence.

When comparing the means of the scales of the MPAM-R to the different divisions there were some differences that were not statistically significant but important to note. On the competence scale, there was a difference (*MD*=0.86, *p*=.133) between Division III and the Women's Division. Division III had higher scores on the competence scale than those in the Women's Division, meaning that they were more intrinsically motivated to participate in wheelchair basketball. This opens an avenue for future research because coaches of the Women's Division may want to look at how they motivate their players to participate and consider some modifications possibly based on what coaches do in the Championship Division and Division III. In addition, perhaps some cross division play may serve as impetus for appealing to wheelchair athletes' motivation for competence.

On the fitness scale, there were also some differences that were not significant but important nonetheless. There was a difference between the Women's Division and Division III (*MD*=0.86, *p*=.221), with the Women's Division scoring higher. There was also a difference between Men's Collegiate and both the Championship Division (*MD*=0.92, *p*=.211) and Women's Collegiate (*MD*=0.86, *p*=.246). The Men's Collegiate scored higher on the fitness scale than both of these other divisions. Previous research found a gender difference on the fitness scale, but the current study did not support this previous finding. Frederick and Ryan (1993) and Ryan et al. (1997) both observed that women scored higher on the scales of fitness and appearance when compared to men. So it is not surprising to see a difference between the Women's Division and Division III, which was mainly comprised of males. The second finding of the Men's Collegiate Division scoring higher than the Championship Division and Women's

Collegiate is unexpected. Fitness is an extrinsic motivator; so, in general, an athlete that is motivated extrinsically will not be as motivated to continue to participate in a sport compared to an athlete that is motivated intrinsically. Increasing competence values over fitness outcomes may serve to shift the motivation perspective of the Men's Collegiate Division player. Initiating the shift may be a coaching function and can be integrated into the coaching approach.

The results of this study also suggest that there was no difference between the individual player classifications of the wheelchair basketball athletes. This study supports the notion that there is no difference in motivating factors between the individuals with varying degrees of disability. The review of the literature identifies that this area needs more attention.

The results offer additional insight into motivating wheelchair basketball players and differences between various divisions in the NWBA. Ryan and Deci (2000) noted that a motivational climate that supports psychological needs is more likely to develop intrinsic motivation towards an activity. This means that if coaches, recreational therapists, and other professionals can provide environments that foster the development and growth of psychological needs, this may lead to more intrinsically motivated individuals in adapted sports. Recreational therapists could create interventions that focus on the growth of the basic psychological needs of autonomy, competence, and relatedness and implement these strategies during sessions with individuals that participate in adapted sport. These professionals could also host local play and educate individuals with disabling conditions about the benefits of adapted sports. Additionally, recreational therapy professionals could advocate for wheelchair sports starting in the rehabilitation setting, by communicating with other disciplines such as physical therapy and orthotics and prosthetics. By increasing these interactions, individuals with disabilities could have more exposure to adapted sports.

Understanding the motivational factors for all athletes is important. Given the breadth of benefits of participation in adapted sport activities, the motivation and continued engagement of the wheelchair athlete is important. Retention and continuing participation across wheelchair sports divisions is a challenge and options should be explored to maintain the athletes' interest and active participation. This participation should begin in the rehabilitation process and continue across the lifespan.

Improved health and wellness in people, regardless of disability status, can lead to more productive, happier, and engaged individuals. Adapted sports are one way in which people with physical disabilities can improve their health and wellness. Since the research literature demonstrates vast benefits of adapted sports (Hanson et al., 2001; Price et al., 2000; Wilhite & Shank, 2009), it would seem logical that professionals such as recreational therapists would promote the lifelong implications from participation. Currently, however, there is limited research examining factors that motivate wheelchair and adapted sport athletes to participate in their sport. Understanding what motivates these athletes is important because it can relate to adherence, attitudes associated with the sport, and well-being (Frederick & Morrison, 1996; Ryan et al., 1997). This study demonstrated that there are differences in motivating factors among the different divisions in the NWBA. It also identified areas of future research. One area of inquiry involves an exploration of motivation and participation factors and approaches in the Women's Division, including motivational climate, coaching, and an examination of practices.

Limitations

This study examined motivating wheelchair basketball players and the differences between various divisions in the NWBA. However, there are some important limitations to note.

Limited number of participants. This study included 96 wheelchair basketball athletes from the NWBA, which may not be completely representative of all of the athletes in the league. A stratified random sample with modifications was used to survey teams from the NWBA and in total 72 teams were contacted. Of the approximately 720 wheelchair basketball athletes contacted, only 96 responded (13.3% response rate).

Representative nature of participants. This study included more male respondents (61.5%) than female respondents, as well as more Division III athletes (42.7%) than any other division. These numbers could be seen as a limitation but it is important to understand that Division III is the largest division, and generally, the sport of wheelchair basketball is dominated by men (NWBA, 2016). The Qualtrics survey used also limited the sample to those with Internet access.

Respondent truthfulness. Participants in this study completed online questionnaires. There was no way for the researcher to control for truthfulness of responses, and there was no way to help if a participant did not understand a question.

SDT dynamic processes. SDT identifies dynamic processes that change over time, and may not be observed using a cross-sectional method. Additionally, the motives for participation are fluid and an individual may change in motivational focus as they continue in an activity. There is no way for the researcher to control for this in this study.

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Appendix A

Extended Literature Review

Extended Literature Review

Introduction

This literature review is organized to offer a thorough review of research regarding wheelchair sports and specifically athlete motivation in wheelchair basketball. The literature review begins with an overview of individuals with disabling conditions and then transitions into adapted sports participation and the benefits of adapted sports. The next area covered is the sport of wheelchair basketball and areas of research. The final section focuses on motivation and what motivates individuals without disabilities, individuals with disabilities, and individuals that participate in wheelchair basketball.

Overview of Disabling Conditions

According to the International Classification of Functioning, Disability, and Health (ICF), disability is an umbrella term for impairments, activity limitations, and participation restrictions. Instead of viewing it as a dichotomous concept, disability is functioning that individually differs due to changes in body structure that impact body function, activities and participation function, and personal and environmental factors (WHO, 2001). It is estimated that there were approximately 56.7 million (18.7%) Americans living with a disability in 2010 and 12.6% of the population had a severe disability. A severe disability is categorized as one in which an individual is unable to perform one or more functional activities, uses a wheelchair, cane, crutches, or walker, needs assistance from another person to perform one or more activity of daily living (ADL) or instrumental activity of daily living (IADL), has one or more selected symptoms that interfere with everyday activities, or are diagnosed with an intellectual or developmental disability. Individuals with disabilities constitute the world's largest minority and are at high risk for secondary health conditions (WHO, 2014). The number of people with

disabilities is on the rise due to advances in technology and the trend in increased life expectancy (U.S. Department of Health and Human Services, 2005).

Adapted Sports and Persons with Disabling Conditions

Compared to people without disabilities, many individuals with disabilities have a lower quality of life, limited community integration, and poor health (Yazicioglu, Yavuz, Goktepe, & Tan, 2012). Therefore, while options for community engagement and physical activity are limited, it is essential for individuals with disabling conditions to engage in meaningful activity.

Adapted sports offer an opportunity to both promote community engagement and to improve functioning. Adapted sports are activities that involve physical exertion and the use of specific physical skills by individuals whose participation may be motivated by a combination of intrinsic and extrinsic rewards (Wilhite & Shank, 2009). Researchers have documented that involvement in adapted sports can significantly improve the quality of life, community integration, and health of their participants. (Abel, Platen, Rojas Vega, Schneider, & Strüder, 2008; Giacobbi, Stancil, Hardin, & Bryant, 2008; Zabriskie, Lundberg, & Groff, 2005).

Adapted sports were used after WWII to help soldiers and civilians affected by the war to rehabilitate. Originally used as a form of treatment and rehabilitation, adapted sports are now seen as both a recreation activity and a means to improve functioning. Sir Ludwig Guttemann, the individual credited with pioneering and making adapted sports possible, established the Spinal Injuries Centre at Stoke Mandeville Hospital, where he was able to promote participation in sports for individuals with spinal cord injuries (Goosey-Tolfrey, 2010). Guttemann designed these programs to have benefits in three main areas: physical rehabilitation and health, recreation and psychological well-being, and social reintegration (Goosey-Tolfrey, 2010). Currently, individuals with various disabilities participate in a wide range of adapted sports.

Physical Benefits of Adapted Sports

Individuals who engage in adapted sports receive many of the same physical benefits that athletes without disabilities receive. Athletes who participate in adapted sports have increases in maximum oxygen uptake (VO_{2max}), ventilatory threshold (VT), greater left ventricle volumes (LV), and other signs of aerobic fitness (Coutts & McKenzie, 1995; Lakomy, Campbell, & Williams, 1987; Price, Davidoff, & Balady, 2000).

Lakomy et al. (1987) examined the physiological responses of maximum heart rate, VO_{2max}, blood lactate levels, maximum ventilation and 5 km pushing performance for twelve wheelchair athletes. Ten athletes with paraplegia and two athletes with quadriplegia completed an incremental exercise test and a 5 km timed treadmill test. The researchers found that the wheelchair athletes had lower VO_2 max values compared to athletes without disabilities performing a similar arm exercise. The results demonstrate that the same physiological responses that influence endurance runners also influence the endurance performance of wheelchair athletes.

The amount of training necessary to reach the recommended energy expenditure for wheelchair athletes was studied by Abel et al. (2008). Participants were male athletes with spinal cord injuries (n=36) who participated in either wheelchair basketball, tennis, or rugby. Energy expenditure was collected using indirect calorimetry during a typical training session. Based on the athletes tested, the energy expenditure of the wheelchair basketball and wheelchair tennis athletes was sufficient to maintain fitness according to ACSM guidelines.

Goosey-Tolfrey and Leicht (2013) reviewed literature to determine if field-based environment wheelchair testing compared to laboratory testing affected performance. Field-based testing has been shown to provide more accurate measures because athletes are in their

own sports wheelchair, the tests are completed on the same surface used during the sport, and many of same skills used during competition are being analyzed. The authors suggested that physiological measures that reflect a "good" athlete still need to be defined and identified. Limitations in the literature suggest that each sport should have its own parameters.

In a study by Leicht, Bishop, and Goosey-Tolfrey (2012) the effects of exercise on athletes with paraplegia (n=8), quadriplegia (n=9), and non-spinal cord injuries (n=8) was examined. The researchers utilized a submaximal exercise test and measured peak oxygen uptake (%VO_{2peak}), heart rate (HR), blood lactate concentration (BLa), and rating of perceived exertion (RPE). Results indicated that there were no significant differences among the sample in response to exercise when comparing their individual %VO_{2peak} and RPE to BLa reference points. This did not support the author's hypothesis of the athletes with quadriplegia would have a lower %VO_{2max} in submaximal exercise compared to the other groups. The results demonstrated that practitioners can prescribe exercise intensity as a function of %VO_{2peak} or based off of RPE.

Price et al. (2000) compared cardiac morphology and function of wheelchair athletes, long-distance runners, and sedentary individuals during a graded arm exercise. The results suggested that both wheelchair athletes and the long-distance runners had increased LV volumes and that the runners had a significantly lower submaximal heart rate in the arm exercise compared to the two other groups. The authors concluded that both long-term arm and leg exercises can increase LV volume compared to untrained control subjects, although to a lesser extend in those who used arm exercise, thus giving these athletes a physiological advantage by reducing the workload of the heart.

In a study involving 30 male wheelchair athletes, Coutts and McKenzie (2005) instituted a progressive exercise test to peak oxygen uptake on a wheelchair ergometer to measure $VO_{2peak,}$ ventilatory threshold in one minute (VTL), and ventilatory threshold expressed as a percentage of peak VO_2 (VT%). The subjects were classified by their disabilities and into three categories based on the sports that they participated in: track, basketball, or other. The results demonstrated that athletes with quadriplegia had a lower VO_{2peak} than those with paraplegia and that athletes that participated in track had the highest VTL and VO_{2peak} followed by those who participated in basketball and lastly other sports. It was established that there are varying fitness performance levels between the different sports.

Psychological Effects and Quality of Life Changes due to Adapted Sports

Individuals with disabilities receive more than physical benefits from adapted sports; they benefit psychologically as well. Participation in adapted sports correlate to increased quality of life (QoL), as well as, overall health and life satisfaction (Groff, Lundberg, & Zabriskie, 2009; Zabriskie et al., 2005). Furthermore, individuals who participate in adapted sports have feelings of empowerment, extraversion, motivation for continued involvement, and decreased levels of anxiety and depression (Giacobbi et al., 2008; Gioia, et al., 2006).

In a cross-sectional design to compare 30 elite athletes with disabilities to 30 individuals with disabilities who did not participate in any adapted sports, Yazicioglu et al. (2012) examined effects of adapted sports participation on QoL and life satisfaction of individuals with physical disabilities. The cross-sectional design compared the 30 elite athletes with disabilities to 30 individuals with disabilities who did not participate in any adapted sports by providing a questionnaire with four parts: socio-demographic data, World Health Organization Quality of Life Scale, Satisfaction With Life Scale (SWLS), and two open-ended questions on sports

participation. The results indicated that the participants who were involved in adapted sports had significantly higher QoL and life satisfaction scores than those participants who did not engage in adapted sports.

Zabriskie et al. (2005) examined the QoL and athletic identity of individuals with disabilities in a community-based therapeutic recreation and adaptive sport program. A total of 130 participants completed either an alpine skiing (n=92) or a horseback riding sessions (n=37) and then completed a 28-item questionnaire about program involvement, participation, perceptions, and socio-demographics at completion of activities. The results showed that participation in these programs influenced QoL, overall health, quality of family life, and quality of social life in a positive manner.

A study completed by Groff et al. (2009) examined the effects of participation in adapted sports on QoL and athletic identity in 73 athletes with cerebral palsy participating in the 2005 Cerebral Palsy World Championship. Participants completed the Athletic Identity Measurement Scale and the Influence on Quality of Life Scale. The researchers found that there was a significant relationship between the influence of adapted sports on QoL and athletic identity. Furthermore, the majority of the sample agreed or strongly agreed that adapted sports influenced their overall health, QoL, quality of family life, and quality of social life.

Giacobbi et al. (2008) examined the relationship between physical activity and QoL experienced by 26 individuals with disabilities recruited from a wheelchair basketball tournament. The participants were administered the Physical Activity Scale for Individuals with Physical Disabilities and in-depth interviews that concentrated on physical activity and QoL. The results demonstrated that the participants perceived psychological benefits, physical health benefits, social opportunities, social influences, and increased overall QoL from the adapted

sport and that the participants' evaluations support self-efficacy beliefs, feelings of empowerment, and motivation for continued involvement.

The association between sports activity and psychological profiles in patients with spinal cord injury (SCI) was examined by Gioia et al. (2006). A cross-sectional design was used that divided 137 males with SCIs into two groups according to sport participation: high frequency and no sport participation. The researchers administered the State-Trait Anxiety Inventory, Form X2 to measure anxiety, the Eysenck Personality Questionnaire for extraversion, and the questionnaire for depression and found that there was a significant difference between groups in anxiety levels and extraversion. Additionally, there was a significant difference in depression between groups and also between individuals with quadriplegia and individuals with paraplegia in which those with quadriplegia had higher scores of depression.

While the psychological benefits of adapted sports are evident, there are other psychosocial and community-based benefits. Adapted sports also play a role in the social integration of individuals with disability into the life of the community.

Social Benefits and Community Integration due to Adapted Sports

Individuals who engage in adapted sports also tend to benefit socially and in areas of community integration. Researchers (e.g., Blinde & McClung, 1997; Shapiro & Martin, 2010) have demonstrated that individuals with disabilities who engage in sports have greater peer relations and increased social interactions than those who do not engage in adapted sports. These same individuals experience enhanced independence and a more positive view of themselves (Hanson, Nabavi, D, & Yuen, 2001; Lundberg, Taniguchi, McCormick, & Tibbs, 2011). Additionally, involvement in adapted sports has been demonstrated to encourage engagement in meaningful life activities and roles (Wilhite & Shank, 2009).

Shapiro and Martin (2010) investigated the relationships between athletic identity, affect, and peer relationships among 36 young athletes with physical disabilities. The participants completed the Private-Public Athletic Identity Scale, the Positive and Negative Affect Schedule, and the Peer Relations Scale. The participants reported averages of 4.0 of 5.0 on the private athlete scale, 2.4 of 5.0 on the public athlete scale, 4.4 of 5.0 on the positive affect scale, 1.7 of 5.0 on the negative affect scale, and 5.0 of 6.0 on the peer relations subscale. The results demonstrated a significant relationship between positive affect and peer relations and no relationship between athletic identity and peer relations, suggesting that adapted sports provide young athletes with disabilities the opportunity to express themselves emotionally and experience peer relationships.

A study by Lundberg et al. (2011) investigated the outcomes of adapted sports and recreation participation in individuals with disabilities by conducting in-depth open-ended interviews (n=17). The researchers determined that involvement in adapted sports and recreation led to enhanced ability of participants to build social networks, experience independence, positively compare themselves with others without disabilities, and feel a sense of normalcy. These findings demonstrate the importance of the social interactions inherent to adapted sports and recreation and the need for individuals with disabilities to interact with their peers.

Hanson et al. (2000) examined participation in sports in individuals with spinal cord injuries and their level of community integration measured by the Craig Handicap Assessment and Reporting technique (CHART). The authors compared 30 athletes with spinal cord injuries to 18 individuals with disabilities that did not participate in sports and found that the athletes had significantly higher scores in four out of five subsections (physical independence, mobility, occupation, and social integration) than the nonathletic group.

Blinde and McClung (1997) examined the effect of recreational activities in eleven women and twelve men with disabilities who participated in activities such as: horseback riding, swimming, fitness, weightlifting, racquetball, bowling, tennis, fishing, walking, and tai chi. The researchers recorded interviews post-intervention and determined that four areas were impacted in the participants' view of their physical self: (a) experiencing the body in new ways, (b) enhancing perceptions of physical attributes, (c) redefining physical capacities, and (d) increasing the perceived confidence to pursue new physical activities. Additionally, two areas concerning their social self were affected: social interactions and experiences and initiating social experiences in other contexts.

Wilhite and Shank (2009) examined how participation in sport helps individuals with disabilities achieve and maintain health and well-being. The researchers interviewed 12 participants and used the framework of the ICF to understand how the participants pursued and maintained their health. Results demonstrated that benefits included enhanced functional capacity, health promotion, relationship development, increased optimism, and inclusion in meaningful life activities and roles. The researchers concluded that sport are valuable for increasing physical fitness, emotional well-being, and social interactions and that the ICF can be used as a framework to increase sports participation in individuals with disabilities.

While adapted sports began as a form of rehabilitation, it has evolved into a complex set of offerings. Adapted sports have many documented benefits for individuals with disabilities, including psychological effects and quality of life, social benefits and community integration, and changes in physical functioning and overall health. Wheelchair basketball is an example of an adapted sport that can be participated in to obtain these benefits.

Wheelchair Basketball in Adapted Sports

Wheelchair basketball is one of the more popular adapted sports for individuals with disabilities, with approximately 30,000 participants worldwide (Gil-Agudo, Del Ama-Espinosa, & Crespo-Ruiz, 2010). The International Paralympic Committee (IPC) is the global organization for all Paralympic activities, however wheelchair basketball, along with a few other sports, has its own classification system created and governed by the International Wheelchair Basketball Federation (IWBF). In the United States, a different classification system was created in 1999 by the National Wheelchair Basketball Association (NWBA). This classification system was created because many involved in the sport did not like the system used by the IWBF. Currently, both associations use the IWBF classification system.

In the IWBF classification system, athletes are divided into four major classes, one through four, with half classes for exceptions that do not fit exactly into one class. These classes are based on trunk movement, stability, and players' functional capacity in terms of their playing skills (Gil-Agudo et al., 2010). Athletes classified as a 4.5 have minimal disability whereas an athlete with a classification of 1.0 has the highest level of disability. At any given time during the game, there can only be five players from a team with a maximum of 14.0 points on the court. These systems are designed to provide individuals with disabilities of varying levels of ability the opportunity to play together (See Table 4).

Table 7.

Individual Functional Classification Guidelines

Functional Class	Description
Class 1.0	No active movement of the trunk in the vertical, forward, or sideways plane
Class 1.5	Has characteristics of a class 1.0, but able to move partially out into forward plane, able to rotate upper trunk, able to transition from catching to passing or shooter faster than class 1.0, more stable upon contact than class 1.0, and more at ease with ball within cylinder of movement.
Class 2.0	Has active use of upper trunk in the vertical and forward planes, able to rotate the upper trunk while upright in both directions, able to hold the ball forward with both arms extended, able to lean the trunk into the forward plane about 45 degrees with control and return to the upright sitting position, able to actively bring upper trunk off the backrest of the chair, and uses hands to return to upright of trunk if no thighs-unless knees are significantly higher than the hips.
Class 2.5	Has characteristics of class 1.0, but able to lean forward 90 degrees and return to upright sitting position without proper upper extremity assist with knees higher than hips, able to lean forward and rotate the upper trunk simultaneously, Able to lean forward and rotate the upper trunk simultaneously, active movement of both the Upper and Lower Trunk but not coordinated or as one unit, lower Trunk is not against the backrest at all times, may have a lordosis (Curve in low back) to assist in returning to upright, and more stable than a Class 2.0 player but still has loss of stability in trunk.
Class 3.0	Displays active use of the upper and lower trunk in the forward and vertical planes: Can lean forward 90 degrees, placing chest on thighs and return to upright with ease without knees significantly higher than hips, can hold the ball with both hands outstretched in front of face without loss of stability, can rotate upper and lower trunk as a unit not supported by wheelchair backrest, rotation of the trunk occurs at the level of the pelvis not the waist, unable to maintain stability leaning sideways, and works within a ‘Cylinder’
Class 3.5	Has characteristics of a class 3.0, but able to move partially out into the sideways plane and return to upright sitting, able to remain upright in hard contact situations forward, able to sit with hips higher than knees, often raises and lowers trunk with each push, able to generate some power in legs with pushing, able to retrieve a ball with two hands on the floor slightly to the side and return to upright position, can lean to the side but remains within his base of support, plays within a WIDER cylinder than a Class 3.0 player, does not have full volume of action to either side.
	Displays the ability to move the trunk maximally in all planes of movement with

Class 4.0	weakness to one side, has one strong side and one weaker side, able to lean strongly to one side, usually able to lean to weak side slightly, can hold the ball with outstretched hands in front or overhead without loss of stability even in contact situations, no need to counterbalance even in contact situations unless contact is forceful and directed into the weaker side.
Class 4.5	Displays the ability to move the trunk maximally in all planes of movement with no significant weakness in any direction, full volume of action in all planes, displays ability to lean to either side during shooting, passing, contesting a shot or trying to intercept a pass.

According to both the IWBF and the NWBA, an individual must have a lower limb disability in order to participate in the sport (IWBF, 2016; NWBA, 2016). The NWBA further elaborates on this and states that "to be eligible for play in the NWBA, a player must have an irreversible lower extremity disability such as paralysis, amputation, or radiological evidence of limb shortening, partial to full ankylosis or joint replacement, which consistently interferes with mobility" (NWBA, 2016). In order for an individual to participate in a sanctioned wheelchair basketball league, the individual must meet the minimal disability criteria and have it certified by a doctor.

In most of the studies examined, the vast majority of wheelchair basketball players have had SCIs that resulted in either paraplegia or quadriplegia (Abel et al., 2008; Skordilis et al., 2001; Sporner et al., 2009). However, SCIs are not the only injury found in wheelchair basketball players. In a study conducted by Leicht et al. (2012), the participants were divided into three groups: quadriplegic, paraplegic, and non-SCI. Individuals that were categorized in the non-SCI group had diagnoses of amputation, club foot, and brittle bones. Giacobbi et al. interviewed 26 wheelchair basketball athletes that self-reported their health conditions as: paraplegia, amputation, cerebral palsy, quadriplegia, spina bifida, and chronic pain (2007). de Lira et al. also identified elite athletes from Brazil with diagnoses of poliomyelitis that

participated in wheelchair basketball (2010). These are the most common injuries and disabilities found in wheelchair basketball athletes that meet the criteria to participate in the sport.

Research in Wheelchair Basketball

Much of the research surrounding wheelchair basketball has focused on the anaerobic performance and functional classification, biomechanics and specific skills related to basketball, and psychological and motivational factors. Since the inception of the IWBF functional classification system, researchers have compared and tested the different classes to see if they differ on cardiorespiratory fitness, field tests, and skills specific to basketball. Researchers have also been interested in what motivates individuals to participate in wheelchair basketball and if wheelchair basketball athletes have different characteristics than individuals with disabilities that do not participate in sport.

Anaerobic performance and functional classification. de Lira et. al (2010) evaluated the aerobic and anaerobic performance of 17 highly trained wheelchair basketball athletes to see if there was a correlation with the IWBF functional classification system. The athletes underwent cardiopulmonary exercise testing and performed a Wingate-like-30 second sprint test which measures power output. The results demonstrated that there was a correlation with IWBF functional classification system, as the functional classification number increased so did power output, anaerobic, and aerobic performance.

A study by Crespo-Ruiz, Del Ama-Espinosa, and Gil-Agudo (2011) examined the biomechanics of ten elite wheelchair basketball athletes and compared the analysis to each individual's functional classification. The authors marked 22 different spots on the athletes' right upper limb for the analysis and found that push phase duration, the ratio of push

phase/recovery phase, and contact and propulsion angle decreased with functional classification. They speculated that this finding may be due to the fact that individuals with lower functional classifications tend to have greater disability and less strength in their arms and decreased range of motion in their shoulders and wrists. This study suggests that more emphasis should be placed on biomechanical analysis to assess functional classification.

Molik, Laskin, Kosmol, Skucas, and Bida (2010) examined the relationship between upper extremity AnP and functional classification in the IWBF in 97 male wheelchair athletes. The participants completed the Wingate Anaerobic Test with an arm ergometer and the researchers observed no significant difference in AnP between classes 1.0-2.5 and classes 3.0-4.5. The researchers suggested to collapse the current classification system and considering adding a physiological test like AnP or aerobic performance, biomechanical analysis, standardized sport-specific performance, or fitness testing.

Vanlandewijck, Spaepen, and Lysens (1995) examined the relationship between wheelchair basketball performance and the level of physical impairment in 52 elite wheelchair basketball players. The authors videotaped wheelchair basketball games and analyzed them using the Comprehensive Basketball Grading System. The physical fitness parameters of aerobic power, propulsive force, and maximal exercise capacity were tested in a laboratory setting. The results demonstrated that there was a difference in field performance and cardiorespiratory fitness between class I athletes and the other classes but there was no difference between classes II, III, and IV. The authors agree with the finding of Brasile (1990) to decrease the number of functional classifications.

Biomechanics and specific skills related to basketball. Brasile (1990) compared the NWBA classification of 79 males to a skills test consisting of five tests: pass for accuracy with

non-dominant hand, 20-meter sprint, obstacle dribble, minute shot with dominant hand, minute shot with non-dominant hand, and spot shot. These tests were derived and modified from previous studies by Brasile (1984, 1986). The results demonstrated that there were no significant differences between Class II and Class III in any skills level. The researchers also determined that the amount of time that an athlete has played basketball effects skill proficiency. The most important predictors of overall skill were the participant's NWBA classification level followed by the number of years the athlete has played basketball. These results support the notion to decrease the number of classes in the classification system.

Vanlandewijck, Daly, and Theisen (1999) examined wheelchair basketball performance in 48 male athletes with disabilities by assessing aerobic capacity (25-meter shuttle run), anaerobic capacity (30 second sprint), and six specific basketball skills (lay-up, wheelchair and basketball handling, sprint capacity, shot, wheelchair maneuverability, and pass accuracy). The results demonstrated that the wheelchair basketball field battery used in this study is valid and reliable with respect to anaerobic capacity and basketball skill proficiency. The shuttle run adapted for wheelchair users as an aerobic measure did not establish significant validity.

In a study by Malone, Gervais, and Steadward (2002), the researchers recorded, by video, all the clean free throws completed during the 6th Men's Gold Cup Wheelchair Basketball Championship and examined the different release parameters and shooting techniques between the classes. The authors found significant differences between the upper classes (classes 3 and 4) compared to the lower classes (classes 1 and 2). The lower class, on average, released the ball from a lower height with a greater velocity and angle of release. This technique created a larger margin of error; however, there was no significant difference in free throw shooting percentages between the four classes.

De Groot, Balvers, Kouwenhoven, and Janssen (2012) investigated the reliability and validity of ten wheelchair basketball field tests: pass-for-accuracy, 5-meter sprint, free throw shooting, 20-meter sprint with ball, maximal pass, slalom, lay ups, pick-up the ball, spot shot, and suicide. The results demonstrated that reliability for speed-related test items were good and the validity was moderate to good for most test items when examined by competition standards, player ratings, and coach ratings. The ten field tests could be divided into two constructs, tests that involved speed and tests that involved shooting/passing. The shooting and passing tests were found to be the least reliable and valid and must be cautiously interpreted.

Psychological and motivational factors. In a study by Martin, Byrd, Watts, and Dent (2015), grit, hardiness, and resilience were tested as predictors of sport engagement and life satisfaction in 75 wheelchair basketball athletes. The results demonstrated that athletes that were higher in resilience and hardiness expressed greater life satisfaction compared to those with lower levels of resilience and hardiness. The authors also found that hardiness was more related to life satisfaction than resilience and that grit did not promote life satisfaction. For sport engagement, grit was the most important factor out of the three measures. Overall, grit was found to be strongly related to sport engagement and relatively unrelated to life satisfaction, hardiness was strongly related to life satisfaction and relatively unrelated to sport engagement, and resilience was moderately related to both sport engagement and life satisfaction.

Paulsen, French, and Sherrill (1990) compared the mood states of 26 wheelchair basketball athletes to 28 individuals that used wheelchairs but did not participate in any sport. The authors used the Profile of Mood States to examine scores of anger, confusion, depression, fatigue, tension, and vigor. Elite athletes typical demonstrate an iceberg profile, meaning they score above the 50^{th} percentile for vigor and below the 50^{th} percentile for tension, anger,

depression, fatigue, and confusion. The results showed that both the athletes and the non-athletes showed iceberg profiles and that the wheelchair basketball athletes scored significantly lower on depression than the non-athletes.

The relationship between four different types of self-efficacy (performance, training, resiliency, and thought control) as well as positive and negative affect in wheelchair basketball athletes was examined by Martin (2008). In general, the athletes were found to express more positive feelings compared to negative affect. The wheelchair basketball athletes reported moderate to strong efficacy cognitions but had the weakest training efficacy. Individuals that were efficacious about their training tended to also have strong performance efficacy. Additionally, athletes with strong resiliency and thought control efficacy also had more positive affect and less negative affect.

Wheelchair sports plays an important role in the well-being of the wheelchair athlete with multiple benefits. One area in need of additional inquiry is what motivates individuals to participate in sport. To understand the role of motivation, one needs an understanding of the Self-Determination Theory (SDT) (Ryan and Deci, 2000).

Self-Determination Theory (SDT)

SDT is a theory that examines growth tendencies and innate psychological needs, and how these influence self-motivation and personality integration. SDT is applied in understanding and providing motivation for participation in adapted sports programs such as wheelchair basketball. SDT describes the factors and various processes that foster human motivation. Additionally, SDT research also examines the environmental factors that promote and hinder self-motivation, social functioning, and personal well-being (Ryan & Deci, 2000).

According to Ryan and Deci (2000) individuals have three innate psychological needs that must be met in order to be self-motivated: the need for competence, the need for relatedness, and the need for autonomy. Competence is the need to feel effective and capable of completing tasks and trials of everyday life. The desire for competence leads individuals to pursue challenges that are ideal for their capabilities and to continually try to maintain and enhance those skills and abilities through an activity (Ryan & Deci, 2000). Relatedness is a feeling of being connected or belonging to others. Relatedness is not concerned with the achievement of a certain outcome, instead it encompasses the tendency to connect with and be accepted by others. Autonomy is the need to be responsible for one's own behavior, motives, and internal demands (LaGuardia & Ryan, 2002). Individuals experience their behavior as an expression of themselves when they are autonomous. As individuals, we seek support for these needs in order to have a healthy psychological environment in which to participate. In most of the research on participation motivation, much of the focus has been on the needs of competence and autonomy because the satisfaction of these needs has reliably been proven to demonstrate intrinsically motivated behavior (Frederick-Recascino, 2002). Relatedness can also be important for participation motivation, especially in activities that are considered less interesting and engaging.

If these basic needs are met, an individual is intrinsically motivated, meaning that there is a natural tendency towards exploration, mastery, assimilation, and spontaneous interest (Ryan & Deci, 2000). Additionally, when an individual is in a state of intrinsic motivation, they are at a level of optimal challenge and this fulfills the need for competence. When an individual is experiencing choice in their behavior the need for autonomy is fulfilled (Frederick-Recascino, 2002). These are feelings that are frequently associated with the sport.

In contrast, an individual is extrinsically motivated if involvement in a sport is to primarily attain outside rewards. The individual is not engaged because they enjoy the sport, instead they are receiving an external reward such as improved personal appearance or avoiding punishment. The individual is not experiencing feelings of competence or autonomy, instead the activity is a means to an end. An individual participating in an activity can be both intrinsically and extrinsically motivated but will vary in the relative amount of each motivation.

Motivation

In order to understand why an individual participates in an activity, one must understand what motivates them to participate in the activity. Motivation involves energy, direction, persistence and equifinality, which are all aspects of activation and intention. However, motivation is not a single construct; instead, there are a collection of different types of motivations that differ in category and level of generality. This means that an individual could decide to participate in an activity for a number of different reasons that vary greatly depending on experiences and consequences (Ryan & Deci, 2000).

Motivation for Individuals without Disabilities

Kilpatrick, Hebert, and Bartholomew (2005) examined the motives for sports participation versus exercise participation with the Exercise Motivation Inventory-2 (EMI-2) in 233 college students. The authors also collected descriptive information about the frequency, duration, intensity, and adherence of the participants' physical activity. The EMI-2 has 14 different factors that represent different motives for engaging in physical activity. The results showed that participants that exercised rather than participated in a sport were more motivated by appearance, strength and endurance, stress management, weight management, and all three health-related variables (health pressure, ill-health avoidance, and positive health), whereas sport

participants rated affiliation, challenge, competition, enjoyment, and social recognition as more important motives. Gender differences were also found with men reporting higher levels of challenge, competition, social recognition, and strength and endurance motivation. Women only rated weight management higher than men.

A study completed by Quindry, Yount, O'Bryant, and Rudisill (2011) examined the motives for engagement in physical activity in individuals ranging in age from 13 to 84 years. Participants were grouped based on their age: adolescent (<19 years), young adults (20-34 years), middle-aged adult (35-49 years), young old adult (50-64 years), and old adult (65+ years) and given the EMI-2. Overall results including all ages demonstrated that participants were motived by health motives and fitness motives with interpersonal motives being reported the least. A gender difference was also demonstrated with women reporting a stronger weight management motivation while men tended to engage in exercise for the reason of competition. The authors found general differences between the age groups with young old adults having the highest fitness motivation, middle-aged adults reporting the highest body-related motives, young old and old adults reporting the highest levels of health motives, middle-aged adults having the highest psychological motivation, and adolescents and young adults having the highest levels of interpersonal motivation.

In a study conducted by Ryan, Frederick, Lepes, Rubio, and Sheldon (1997), athletes who participated in Tae Kwon Do were found to be more highly associated with motives of interest/ enjoyment and competence compared to the aerobic participants. On the other hand, the aerobic participants had higher levels of appearance as a motive for participation compared to the individuals that engaged in Tae Kwon Do.

Frederick-Recascino and Schuster-Smith (2003) found similar results when comparing the motives for engagement for bicycle racers and fitness exercisers. The study compared the competitive attitudes, participant motivation, physical activity, and adherence levels between 58 adult amateur bicycle racers and 65 fitness exercisers. The authors found that the cyclists had higher intrinsic-oriented motives and lower extrinsic-oriented motives than the group of non-competitive exercisers. Furthermore, sports competiveness was positively related to intrinsic motivation. The exercise group showed higher levels of appearance motivation, a type of extrinsic motivation, than the cyclist group.

These studies demonstrate that in the population of individuals without disabilities there is a gender difference as well as distinctions in motivation in relation to age. In general, women tend to be more motivated by weight management whereas men were more focused on competition and challenge (Kilpatrick et al., 2005; Quindry et al., 2011). The trend in motivation across the lifespan reveals that at first individuals may be intrinsically motivated but as they progress to middle and old age individuals are more motivated by body, appearance, and health-related motives (Quindry et al., 2011). Furthermore, a difference between sport and general exercise was also found. Individuals that participate in a sport are more likely to be intrinsically motivated than those who participate in fitness or aerobic exercise (Frederick-Recascino & Schuster-Smith, 2003; Ryan et al., 1997).

Motivation for Individuals with Disabilities

As with individuals without disabilities, many studies have been conducted that examine the reasons why individuals with disabilities participate in sport. These studies have used open-ended questions (Furst, Ferr, & Megginson, 1993), questionnaires (Fung, 1992; Tasiemski, Kennedy, Gardner, and Blaikley, 2004), and interviews (Ashton-Shaeffer, Gibson, Holt, &

Willming, 2001; Curry & Wolfe, 2013; Kirkby, 1995) to determine the most common motives for participation for individuals with disabilities. These individuals have stated that they most commonly participate in sport because it is fun, for camaraderie, for physical benefits, and to improve their health (Curry & Wolfe, 2013; Furst et al., 1993). Additionally, gender differences were also found with men more motivated by achievement and athletic identity and females more motivated to participate due to goals and social benefits (Fung, 1992; Tasiemski et al., 2004; Skordillis et al., 2001).

Furst et al. (1993) studied the reasons why 25 athletes with disabilities participate in the sport of triathlon. A survey created by the authors which contained both open and closed questions was distributed to the participants and there were three major findings. First, almost all of the athletes (91%) stated that they were physically active in sport, exercise, or both before the onset of their disability. Additionally, according to the athletes, the primary influence to exercise regularly for them comes first from other individuals with disabilities, next prior experience in the sport, then friends, doctors/therapists, and finally, health concerns. Lastly, the athletes were asked why they competed and gave the following responses in order from the most responses to the least: it's fun, physical development/improve health, love of competition, and socializing.

The different motives and attitudes of both individuals with and without disabilities that participated in netball were examined in a study by Kirkby (1995). Thirty-six (36) athletes with disabilities and 21 individuals without disabilities were interviewed and differences were found in motives for participation. Athletes with disabilities were more likely to participate in netball in order to meet new people, to socialize, or for fitness, whereas individuals without disabilities

commonly stated reasons for participating were because a family member participates or to help or learn more about disability.

The differences for participating in elite sport between male and female athletes with disabilities from the United States, Great Britain, and Japan was examined by Fung (1992). Participants completed a questionnaire that assessed seven motives for participation: fitness, team atmosphere, skill development, excitement and challenge, friendship, achievement and status, and energy release. The author found that there were significant differences between the genders, with men more driven by the need to achieve and attain status whereas women were motivated by friendship. Additionally, there were significant differences between individuals from the three countries. British and American athletes differed from Japanese athletes on the factor of fitness, American and Japanese athletes differed on the factor of excitement and challenge, and athletes from all three countries differed on the factor of team atmosphere.

A study completed by Curry and Wolfe (2013) interviewed 14 athletes with disabilities who participated in various sports in order to determine what specifically motivates adults with disabilities to participate in sport. The interviews were analyzed and similar motivational themes of competition, fun, camaraderie, physical benefits, influencing others, coaches, and "the feeling" were found. Physical benefits was found to be the most prominent theme and all of the participants mentioned some type of physical benefit gained from their sport.

Athletic identity in 678 individuals with spinal cord injuries was examine by Tasiemski et al. (2004). For this study, athletic identity was described as the degree to which an individual see themselves as an athlete. The authors found that athletic identity in individuals with spinal cord injuries is higher in males than females and higher in those who engaged in more hours of sports participation. The mean scores of the Athletic Identity Measurement Scale (AIMS) were

compared to scores of adolescent swimmers with disabilities and able-bodied adults and the scores of the individuals with spinal cord injuries were consistently lower. This was true for gender, individuals that engaged in more than one hour a week of sport participation, and for those with higher athletic status. This suggests that individuals with spinal cord injuries do not see themselves as much as athletes compared to others with disabilities and individuals without disabilities.

Skordillis et al. (2001) gave 34 male and 14 female wheelchair marathoners and 166 male and 29 female wheelchair basketball players the Sport Orientation Questionnaire (SOQ) and the Task and Ego Orientation in Sport Questionnaire (TEOQS) in order to compare the different groups on their sport orientation and goal perspectives. For SOQ, the authors found that the male wheelchair basketball players tended to score significantly higher on the competitive scale than the female wheelchair basketball players; however, the females scored higher on the goal orientation subscale. Additionally, the wheelchair basketball players scored significantly higher on the SOQ win orientation subscale than the marathoners but the wheelchair marathoners scored higher on the goal orientation subscale. As for the TEOSQ, the authors found that the wheelchair marathoners scored significantly higher on the ego orientation subscales. These findings demonstrate that there are differences in sport orientation and goal perspectives in sport and gender.

Motivation for Wheelchair Basketball Athletes

There have been numerous studies completed that focus on the motives of wheelchair basketball athletes. These studies have compared wheelchair basketball athletes to able-bodied wheelchair basketball players, as well as compared the goals and self-efficacy of athletes of different functional classifications.

Fliess-Douer, Hutzler, and Vanlandewijck (2003) used the Task and Ego Orientation in Sport Questionnaire to examine the differences between classifications of wheelchair basketball participants. The authors divided players into two groups based on functional classification: low-point players (those who are classified up to 2.5 points in the functional classification system) and high-point players (those above 2.5). Results found that there were no significant differences between the low-point and high-point players and that the individuals were predominantly task-oriented. This finding suggests that physical impairment in wheelchair basketball athletes has no effect on goal perspective.

Ten female wheelchair basketball players ranging in age from 18 to 32 years were interviewed about their experiences in elite-level sport by Ashton-Shaeffer et al. (2001). Semi-structured interviews were used and the authors discovered two prominent themes of resistance and the use of sport as a means to confront stereotypes of disability, femininity, and sport and the second theme of empowerment as a result of their sport experiences. The participants were elite-level athletes but identified that their interest began in the community or rehabilitation.

In a study by Skordilis, Koutsouki, Asonitou, and Jensen (2002) the sports achievement orientation of wheelchair basketball athletes and non-disabled basketball players without disabilities were compared. The authors found that wheelchair basketball athletes scored higher on the scales of competitiveness and goal orientation, meaning that these athletes participate in basketball in order to meet personal goals and to compete with their opponents more than the athletes without disabilities. Additionally, the results demonstrated that the outcome of the game was not of great importance to either of the groups.

The motivational aspects of 57 wheelchair basketball players were compared to those of 70 able-bodied basketball players in a study by Hutzler and Shemesh (2012). The authors

measured self-efficacy, task and ego orientation, and questions on family encouragement and sport activity. The results demonstrated no difference with self-efficacy between the groups but able-bodied athletes scored high on both task and ego orientation. Wheelchair basketball athletes had higher family encouragement and the low-point wheelchair basketball players had lower self-efficacy than the high-point players.

Perreault and Vallerand (2007) examined motivation and coping skills of able-bodied basketball players compared to those of wheelchair basketball players. The study showed that both groups had similar amounts of the different types of motivation. Female wheelchair basketball players scored higher than male wheelchair basketball players on intrinsic motivation to experience stimulation but scored lower on introjection. Again, for coping both wheelchair basketball players with and without disabilities had similar results for coping skills. This study demonstrates that these two groups have similar motives for participating in basketball and are able to cope in similar ways.

Summary

The extended literature review offers a summary of the literature pertinent to the research area of motivation in wheelchair basketball athletes. Much of the research in wheelchair basketball has focused on the classification of athletes and the physiological benefits of the sport. The studies that did look at motivation in wheelchair basketball tend to either be general and interview-based or focus on task and ego orientation, coping, and self-efficacy. This review of the literature demonstrates the need for more studies that focus on the motivating factors for individuals to engage in wheelchair basketball

Appendix B

Extended Results and Conclusion

Extended Results and Discussion

Relationship of Motives for Participation and Gender

A t-test was used to test if there was a difference between gender and the five different scales of the MPAM-R. No significant differences were found between the five motives for participation and gender. Table 5 shows the results of the t-test completed to test the relationship of gender and motives for participation.

Table 8.
Differences between Gender and Motives for Involvement

	Men		Women		Significance
	M	*SD*	*M*	*SD*	
Interest Scale	6.217	0.720	6.006	0.648	0.419
Competence Scale	6.181	0.805	5.862	0.929	0.790
Appearance Scale	4.534	1.536	4.590	1.360	0.293
Fitness Scale	5.902	1.019	5.814	0.899	0.465
Social Scale	4.921	1.001	5.385	0.800	0.297

Relationship of Motives for Participation and Wheelchair Basketball Division

To test if there were any differences between the different divisions in the NWBA and the five scales of the MPAM-R, an ANOVA was employed. Two significant differences emerged. For the competence scale, there was a significant difference [$F_{(4,82)} = 3.118$, p=.020] between groups. Scheffe's post hoc tests demonstrated differences between the Women's Division and the Championship Division (*MD*= 0.74, p= .041). The other significant difference was on the fitness scale [$F_{(4,80)} = 3.665$, p=.009] between the Men's Collegiate Division and Division III (*MD*= 0.96, p= .047). The following tables show the results of the relationships between the five different motives for involvement and the five different NWBA wheelchair basketball divisions (See Tables 6-10).

Table 9.
Differences between Divisions and Motives for Involvement Interest/Enjoyment Scale

		Mean Difference	Standard Error	*p*
Women's Division	Division III	-0.370	0.289	0.800
	Men's Collegiate	-0.128	0.334	0.997
	Women's Collegiate	-0.282	0.334	0.949
	Championship	-0.579	0.339	0.576
Division III	Women's	0.370	0.299	0.800
	Men's Collegiate	0.242	0.232	0.895
	Women's Collegiate	0.089	0.232	0.998
	Championship	-0.209	0.240	0.943
Men's Collegiate	Women's	0.128	0.334	0.997
	Division III	-0.242	0.232	0.895
	Women's Collegiate	-0.155	0.289	0.990
	Championship	-0.451	0.293	0.668
Women's Collegiate	Women's	0.282	0.334	0.949
	Division III	-0.088	0.232	0.998
	Men's Collegiate	0.155	0.289	0.990
	Championship	-0.297	0.293	0.905
Championship Division	Women's	0.579	0.339	0.576
	Division III	0.201	0.240	0.943
	Men's Collegiate	0.451	0.293	0.668
	Women's Collegiate	0.297	0.293	0.905

Table 10.
Mean Differences between Motives for Involvement and Division on the Interest/Enjoyment Scale

Division	*M*	*SD*	*F*	*p*
Women's Division (n= 7)	5.84	0.76		
Division III (n=38)	6.21	0.67		
Men's Collegiate (n=12)	5.94	0.27	1.021	.402
Women's Collegiate (n=12)	6.12	0.15		
Championship (n=11)	6.41	0.20		

Table 11.
Differences between Divisions and Motives for Involvement Competence Scale

		Mean Difference	Standard Error	*p*
Women's Division	Division III	-0.855	0.317	0.133
	Men's Collegiate	-0.488	0.371	0.786
	Women's Collegiate	-0.679	0.366	0.491
	Championship	-1.202	0.371	0.041**
Division III	Women's	0.855	0.317	0.133
	Men's Collegiate	0.367	0.270	0.762
	Women's Collegiate	0.177	0.262	0.977
	Championship	-0.347	0.270	0.798
Men's Collegiate	Women's	0.488	0.371	0.785
	Division III	-0.367	0.270	0.762
	Women's Collegiate	-0.190	0.262	0.987
	Championship	-0.714	0.332	0.337
Women's Collegiate	Women's	0.679	0.366	0.491
	Division III	-0.177	0.262	0.977
	Men's Collegiate	0.190	0.323	0.987
	Championship	-0.523	0.326	0.631
Championship Division	Women's	1.202	0.371	0.041**
	Division III	0.347	0.270	0.798
	Men's Collegiate	0.714	0.332	0.337
	Women's Collegiate	0.523	0.326	0.631

**$p<.05$

Table 12.
Differences between Divisions and Motives for Involvement Appearance Scale

		Mean Difference	Standard Error	*p*
Women's Division	Division III	-0.353	0.555	0.981
	Men's Collegiate	0.014	0.650	1.000
	Women's Collegiate	-1.097	0.650	0.585
	Championship	-1.064	0.661	0.630
Division III	Women's	0.353	0.555	0.981
	Men's Collegiate	0.369	0.473	0.962
	Women's Collegiate	-0.742	0.473	0.652
	Championship	-0.710	0.489	0.716
Men's Collegiate	Women's	-0.014	0.650	1.000
	Division III	-0.369	0.473	0.962
	Women's Collegiate	-1.111	0.581	0.460
	Championship	-1.078	0.594	0.514
Women's Collegiate	Women's	1.097	0.650	0.585
	Division III	0.742	0.473	0.652
	Men's Collegiate	1.111	0.581	0.460
	Championship	0.033	0.594	1.000
Championship Division	Women's	1.064	0.661	0.630
	Division III	0.710	0.489	0.716
	Men's Collegiate	1.078	0.594	0.514
	Women's Collegiate	-0.817	0.594	1.000

Table 13.
Mean Differences between Motives for Involvement and Division on the Appearance Scale

Division	*M*	*SD*	*F*	*p*
Women's Division (n= 8)	4.04	1.03		
Division III (n=37)	4.40	1.41		
Men's Collegiate (n=12)	4.03	1.77	1.688	.162
Women's Collegiate (n=12)	5.14	1.45		
Championship (n=11)	5.11	1.26		

Table 14.

Differences between Divisions and Motives for Involvement Fitness Scale

		Mean Difference	Standard Error	*p*
Women's Division	Division III	-0.860	0.355	0.221
	Men's Collegiate	0.100	0.419	1.000
	Women's Collegiate	-0.766	0.412	0.491
	Championship	-0.812	0.419	0.439
Division III	Women's	0.860	0.355	0.221
	Men's Collegiate	0.960	0.302	0.047**
	Women's Collegiate	0.094	0.293	0.999
	Championship	0.043	0.302	1.000
Men's Collegiate	Women's	-1.000	0.419	1.000
	Division III	-0.960	0.302	0.047**
	Women's Collegiate	-0.865	0.367	0.246
	Championship	-0.912	0.375	0.211
Women's Collegiate	Women's	0.765	0.412	0.491
	Division III	-0.095	0.293	0.999
	Men's Collegiate	0.865	0.367	0.246
	Championship	-0.051	0.367	1.000
Championship Division	Women's	0.817	0.419	0.439
	Division III	-0.043	0.302	1.000
	Men's Collegiate	0.917	0.375	0.211
	Women's Collegiate	0.051	0.367	1.000

**$p<.05$

Table 15.
Differences between Divisions and Motives for Involvement Social Scale

		Mean Difference	Standard Error	*p*
Women's Division	Division III	0.208	0.372	0.989
	Men's Collegiate	0.100	0.445	1.000
	Women's Collegiate	-0.362	0.430	0.950
	Championship	0.155	0.445	0.998
Division III	Women's	-0.208	0.371	0.989
	Men's Collegiate	-0.108	0.323	0.999
	Women's Collegiate	-0.569	0.392	0.490
	Championship	-0.053	0.323	1.000
Men's Collegiate	Women's	-0.100	0.445	1.000
	Division III	0.108	0.323	0.999
	Women's Collegiate	-0.461	0.392	0.846
	Championship	0.546	0.408	1.000
Women's Collegiate	Women's	0.362	0.430	0.950
	Division III	0.569	0.306	0.490
	Men's Collegiate	0.462	0.392	0.846
	Championship	0.512	0.392	0.784
Championship Division	Women's	-0.155	0.445	0.998
	Division III	0.053	0.323	1.000
	Men's Collegiate	-0.055	0.408	1.000
	Women's Collegiate	0.516	0.392	0.784

Table 16.
Mean Differences between Motives for Involvement and Division on the Social Scale

Division	*M*	*SD*	*F*	*P*
Women's Division (n= 8)	5.10	0.49		
Division III (n=39)	4.89	1.06		
Men's Collegiate (n=11)	5.00	0.98	0.897	.470
Women's Collegiate (n=13)	5.46	0.86		
Championship (n=11)	5.02	0.88		

Relationship of Motives for Participation and Individual Classification

An ANOVA was used to test if there were any differences between the eight different individual classifications and the five scales of the MPAM-R. No significant differences were found among the individual classifications and the MPAM-R scales (See Table 11). To expand the inquiry, the individual classifications were collapsed into four classifications instead of eight and tested for differences. This yielded the same results with no significant differences.

Table 17.
Differences between individual classifications and motives for involvement

Scales	*df*	Mean square	*F*	*p*
Interest/enjoyment scale	7	0.529	1.075	0.388
Competence scale	7	0.575	0.759	0.623
Appearance scale	7	1.632	0.772	0.613
Fitness scale	7	0.730	0.738	0.641
Social scale	7	0.711	0.711	0.626

Appendix C

Survey Instrument

Wheelchair Basketball Athletes: Motives for Participation

Q: Your participation in this questionnaire is completely voluntary, and completion is your willingness to participate. By checking yes you are agreeing to participate in this study, I understand that by checking yes this means that I consent to participate.

- ❍ Yes
- ❍ No

Q1 What is your age?

Q2 What is your gender?

- ❍ Male
- ❍ Female

Q3 What is your classification for wheelchair basketball?

- ❍ 1.0
- ❍ 1.5
- ❍ 2
- ❍ 2.5
- ❍ 3
- ❍ 3.5
- ❍ 4
- ❍ 4.5

Q4 How long have you participated in wheelchair basketball?

- ❍ less than a year
- ❍ 1-3 years
- ❍ 4-6 years
- ❍ 7-9 years
- ❍ 10 years or more

Q5 How many sports do you participate in other than wheelchair basketball?

- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5 or more

Q6 How many months of the year do you participate in wheelchair basketball?

- ❍ 0-3 months
- ❍ 3-6 months
- ❍ 6-9 months
- ❍ 9-12 months

Q7 What NWBA division is your team in?

- ❍ Women's
- ❍ Division III
- ❍ Men's Collegiate
- ❍ Women's Collegiate
- ❍ Championship

Q8 The following is a list of reasons why people engage in physical activities, sports, and exercise. Respond to each question (using the scale given), on the basis of how true that response is for you in reference to wheelchair basketball.

Q9 Because I want to be physically fit.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q10 Because it is fun.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q11 Because I like to engage in activities which physically challenge me.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q12 Because I want to obtain new skills.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q13 Because I want to look or maintain weight so I look better.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q14 Because I want to be with my friends.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q15 Because I like to do this activity.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q16 Because I want to improve my existing skills.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q17 Because I like the challenge.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q18 Because I want to define my muscles so I look better.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q19 Because it makes me happy.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q20 Because I want to keep up my current skill level.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q21 Because I want to have more energy.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q22 Because I like activities that are physically challenging.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q23 Because I like to be with others that are interested in this activity.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q24 Because I want to improve my cardiovascular fitness.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q25 Because I want to improve my appearance.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q26 Because I think it's interesting.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q27 Because I want to maintain my physical strength to live a healthy life.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q28 Because I want to be attractive to others.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q29 Because I want to meet new people.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q30 Because I want to enjoy this activity.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q31 Because I want to maintain my physical health and well-being,

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q32 Because I want to improve my body shape.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q33 Because I want to get better at my activity.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q34 Because I find this activity stimulating.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q35 Because I will feel physically unattractive if I don't.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q36 Because my friends want me to.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q37 Because I like the excitement of participation.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Q38 Because I enjoy spending time with others doing this activity.

- ❍ Not at all true for me 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ Very true for me 7

Appendix D

IRB Approval

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
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600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Exempt Certification

From: Social/Behavioral IRB
To: Ashley Bohnert
CC:
Thomas Skalko
Thomas Skalko
Date: 1/25/2016
Re: UMCIRB 15-002028
Wheelchair Basketball Athletes: Motives for Participation

I am pleased to inform you that your research submission has been certified as exempt on 1/24/2016. This study is eligible for Exempt Certification under category # 2.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.