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Reasons For Physical Activity and Exercise Participation in Senior Athletes

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REASONS FOR PHYSICAL ACTIVITY AND EXERCISE PARTICIPATION IN SENIOR ATHLETES

by

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GRADUATE COMMITTEE APPROVAL

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As chair of the candidate's graduate committee, I have read the thesis of Deborah Lynne Fife in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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ABSTRACT

REASONS FOR PHYSICAL ACTIVITY AND EXERCISE PARTICIPATION IN SENIOR ATHLETES

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Research on motives of physical activity and exercise in the elderly is limited. This study used the Participation Motivation Questionnaire for Older Adults (PMQOA) to assess reasons for engaging in regular physical activity in participants of the 2007 Hunstman World Senior Games. The 259 subjects ranged from ages 50 to 85 years and were divided into tertiles based on frequency of exercise, determined by weekly exercise time and days. The most commonly reported reasons for exercise were to stay healthy, keep physically fit, and stay in shape.

A previously conducted factor analysis on the PMAOQ revealed six underlying factors given for engaging in regular exercise: social, fitness, recognition, challenge/benefits, medical and involvement. Analysis of variance indicated significant differences in reasons for exercise between exercise tertiles and three factors; social, fitness, and challenge/benefits. There were also significant differences in reasons given for exercise between gender for the medical and social factors. Bivariate correlations

indicated associations between both BMI and fitness perceptions with some PMQOA factors. Additionally, significant correlations were found between the six PMQOA factors, the strongest being between challenge/benefits, recognition, involvement, and social.

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REASONS FOR PHYSICAL ACTIVITY AND EXERCISE PARTICIPATION IN SENIOR ATHLETES

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Abstract

Research on physical activity and exercise in the elderly is limited. This study used the Participation Motivation Questionnaire for Older Adults (PMQOA) to assess reasons for engaging in regular physical activity of participants at the 2007 Hunstman World Senior Games. The 259 subjects ranged from ages 50 to 85 years and were divided into tertiles based on frequency of exercise, determined by self reported weekly exercise time and days for further comparison. The most commonly reported reasons for exercise were to stay healthy, keep physically fit, and stay in shape.

A previously conducted factor analysis on the PMAOQ revealed six underlying factors given for engaging in regular exercise: social, fitness, recognition, challenge/benefits, medical and involvement. Analysis of variance indicated significant differences in reasons for exercise between exercise tertiles and three factors; social, fitness, and challenge/benefits. There were also significant differences in reasons given for exercise between gender for the medical and social factors. Bivariate correlations indicated associations between both fitness perceptions and BMI with some PMQOA factors. Additionally, significant correlations were found between the six PMQOA factors, the strongest being between challenge/benefits and recognition, involvement, and social.

Introduction

The benefits of regular exercise are well established; yet over two-thirds of adults in the United States are not consistently active and about one-third are completely sedentary (Center, 2006; Dishman, 1994a). It is well known that exercise decreases the risk for many potentially fatal chronic diseases including reducing the incidence of stroke, hypertension, type 2 diabetes, colon and breast cancers, and obesity (Armstrong, Balady, Berry, Davis, Davy, Davy, et al., 2006). In addition to prolonging the quantity of life, exercise enhances the quality of life by improving cardiovascular and respiratory function; increasing performance at work; increasing feelings of well-being; decreasing stress, anxiety, and depression; increasing HDL cholesterol; and reducing total body fat, blood pressure, and insulin needs (Armstrong et al., 2006). Specifically as this relates to the elderly, exercise enhances mobility, increases functional activities of daily living, and decreases disability (Daley & Spinks, 2000; Yasunaga & Tokunaga, 2001; Shephard, Kavanagh, Mertens, Qureshi, & Clark, 1995).

The American population is aging, thus contributing to the growing number of elderly who exercise regularly (CDC, 2006). From 1998-2003, the percentage of inactive elderly decreased and those reporting some leisure-time activity and regular leisure-time activity increased (2006). Despite this, Dishman (1994b) indicates that over half of our nation's seniors do not exercise and do not have intentions of doing so. Although it is understood that physical capacities tend to decline with age, studies show that the effects of aging can be treated with an active lifestyle (Lowenthal, Kirschner, Scarpace, Pollock, & Graves, 1994).

 Physical Activity and Exercise

The U.S. Department of Health and Human Services' document Healthy People 2010 defines a healthy life as one in which "individuals have a full range of function from infancy through old age, allowing them to enter into satisfying relationships with other people and to work and play. Currently, the average baby born can expect to live 77 years, but only 64 of those years will be considered healthy" (DHHS, 2000, p. 5). The first objective/goal listed in Healthy People 2010 is to "Increase quality and years of healthy life," (p. 9). The "quality" of life for the elderly is determined by expected years in good or better health, expected years free of activity limitations, and expected years free of selected chronic diseases (2000). Physical activity and exercise is one of the main recommendations for improving one's physical health and it is encouraging to note that some seniors indicate exercise as a major goal for their leisure time (Dishman, 1994a).

It is perplexing to consider why so many individuals, both young and old, are physically inactive despite the numerous health benefits. Many people identify barriers such as lack of time or resources as explanations for why they do not exercise. Dishman (1994b) indicated that lack of knowledge of the benefits of regular physical activity, lack of access to activity programs, and lack of social support were all barriers that prevente the elderly from exercising. Some studies have shown that aging in general decreases positive attitudes about exercise (Rhodes, Martin, Taunton, Rhodes, Donnelly, & Elliot, 1999). Even when attitudes may be favorable, Lee (1993) determined "The perception of barriers, or costs to exercise, reduces the probability of performing the behavior" (p. 326).

Studies done on the motivational determinants for participating in exercise indicate that participation varies based on activity level s, socioeconomic status, and gender. Boyette, Lloyd, Boyette, Watkins, Furbush, and Dunbar, et al. (2002) found that biomedical status, past exercise participation, education, and socioeconomic status as most predictive of initiation and adherence to an exercise program. Some of the top reasons older women identified for participating in exercise were for physical fitness, social interactions, mental health, and enjoyment (Paxton, Browning, & O' Connell, 1997; Kirby, Kolt, Habel, & Adams, 1999). Similarly, the desire to improve health and to age better have also been identified as determinants of exercise in past research (Cohen-Mansfield, Marx, & Guralnik, 2003; O'Brien Cousins, S., 2001). Others, (Aarts, Paulussen, & Schaalma, 1997) found that past experiences, knowledge, and habits may be some of the best predictors of exercise intentions and maintenance.

The Hunstman World Senior Games is a worldwide sporting competition for seniors, taking place annually since 1987. There is no skill level required and participants must be at least 50 years of age. Events consist of vigorous individual and team sports such as basketball, running, cycling, swimming, volleyball, pickle ball, and tennis as well as leisure events such as square dancing, bowling, ping pong, horseshoes and walking. In 2007, nearly 10,000 participants came from all around the world to take part in the games. Considering that a majority of adults in the U.S. are inactive, there is something fundamentally different between these athletes and their sedentary peers. Because of their active lifestyles, many enjoy a full range of function into their later years, thus making them an ideal group to study.

Wide-ranging research on determinants of exercise has been done by scientists in the field but differences in reasons based on exercise frequency have rarely been studied. Further research is needed to determine why some exercise more often than others and what leading factors enhance long-term physical activity adherence. The purpose of this study is to build on previous research and study reasons for persistent patterns of exercise behavior in a senior athlete population based on physical activity level.

Methods

Participants

Participants (n=259; 112 women, 147 men) were senior athletes at the 2007 Hunstman World Senior Games in St. George, Utah. Participant age ranged from 50 to 85 years, with the average age being 65.33 (SD= 7.19) years. At the games, complimentary health screenings were offered to all games participants. Subjects for the present study recruited from participants in the health screenings. Participants gave permission for further contact and those who submitted an e-mail address were included in the current study.

Instruments

This study assessed reasons for engaging in physical activity and exercise using the Participation Motivation Questionnaire for Older Adults (PMQOA) (Kirby et al., 1998, 1999). The PMQOA was created initially as the Participation Motivation Questionnaire and was used for youth participating in sports. It was later modified for older adults through focus groups with researchers in gerontology and exercise (Gill, Gross, & Hunddleston, 1983). The content validity and reliability of the PMQOA has

been established in previous studies (Kolt, Driver, & Giles, 2004; Kirby et al., 1998, 1999). The 30-item, six factor questionnaire evaluates reasons why older adults participate in physical activity and exercise Items include statements such as "I want to improve my fitness" and "I like the social aspects." Questions were rated on a three-point Likert scale as follows: not at all important, somewhat important, and very important. Participants responded to all items and indicated how important each item was in reference to their participation in physical activity and exercise.

Additional demographic questions assessed age, blood pressure, current smoking status, past smoking status, BMI, fitness perception, activity perception, time spent watching television, and time spent on the computer. There were two descriptive questions classifying the degree or frequency of exercise: How much time per week do you participate in physical activity or exercise that makes you breathe hard or sweat, such as brisk walking, jogging, bicycling, swimming, or other aerobic activities? And: How many days per week are you physically active or exercising to the point of breathing hard or sweating?

Fitness perception was determined by asking participants if they viewed themselves as much more fit, more fit, about the same, less fit, and much less fit than other people their age. Perceptions of how active individuals viewed themselves were derived from two questions, how physically active are you and compared to other persons your age do you see yourself as being much more fit, more fit, about the same, less fit, and much less fit than others. Possible answers to this question included: very inactive,

inactive, average, active, and very active. TV hours and computer hours were self-reported.

Procedure

Free health screenings were offered at the Senior Games to all participants and registered guests. A carotid artery screening was offered to participants on a first come first serve basis. Carotid screening participants were asked to give their contact information, including e-mail address for follow-up.

Of the 675 who received the carotid screening, 342 provided their e-mail address for future contact. An electronic version of the PMQOA was created using the survey program Qualtrics (www.qualtrics.com). Four months after the games, subjects were sent the PMQOA and demographic questions in an electronic form. Of the 342 that had an e-mail address, 259 completed the PMQOA; therefore, there was a 75.7% response rate. The study was approved by the Brigham Young University Internal Review Board.

Statistical Analysis

Data reduction measures were used to reduce the 30 items into six factors related to reasons given for participating and exercise (Kolt, Driver, Giles, 2004). Factor scores were created using the means of all associated items in each of the six categories: social, fitness, recognition, challenge/benefits, medical, and involvement. Participants were divided into tertiles based on their average self-reported weekly exercise time and exercise days. Simple descriptive statistics were calculated as well as kurtosis and skewness to determine if the sampling distributions were normal for each factor.

Chronbach's alpha was used to calculate the reliability of the six factors in the PMQOA and to determine if questions in each factor clustered together. The reliability of the six factors were social $\alpha = 0.90$, fitness $\alpha = 0.77$, recognition $\alpha = 0.75$, challenge/benefits $\alpha = 0.80$, medical $\alpha = 0.66$, and involvement $\alpha = 0.57$.

SPSS was used to determine associations between variables. One-way ANOVA examined the gender differences and between group differences across the six factors and the tertiles of exercisers, with significance set at $p < 0.05$. The tertile groups were compared to identify differences in reasons for participating in exercise for those who exercise more and less frequently. Tukey HSD post hoc tests were used to contrast the significant ANOVA comparisons and to identify which exercise groups differed. Bivariate correlations were calculated for the six factor scores and participants' BMI, fitness perception, activity perception, exercise time, exercise days, current smoking status, past smoking status, and age.

Results

Description of Participants

The current sample was a fairly active, healthy, motivated group of older adults. Participants had an average systolic blood pressure of 123 mmHg/min (SD = 12.2) and an average diastolic blood pressure of 75 (SD=8.4). Average BMI was 26.00 (SD = 4.99), females being slightly lower than males (24.80 and 26.89, respectively). On average, respondents watched 2.8 hours of television daily (SD = 1.45), with males averaging 2.9 and females 2.8 hours. Average daily computer use was 0.25 hours, or 15 minutes per day for both men and women.

On the whole, the sample considered themselves “more fit than others” and “active” on a scale from very inactive to very active. Participants engaged in an average of 5.39 hours of vigorous activity per week, 5.3 (SD=2.6) for women and 5.5 (SD=2.4) for men. Participants were also physically active to the point of breathing hard or sweating 3.84 days per week, with no differences between males and females. Various Senior Games sports and activities were reported. Some of the most common events were softball, track, volleyball, tennis, and basketball. Less commonly reported events were pickle ball, golf, cowboy action shooting, square dancing, swimming, triathalon, and bowling.

Factor Ranking Based on Exercise Time and Days

Subjects were divided into exercise tertiles based on the number of hours per week they engage in exercise that caused them to breathe hard or sweat. The lowest tertile, rare exercisers (n=117, exercised 4.99 hours or less per week) ranked fitness and medical as the most important reasons for participating in leisure time physical activity, followed by challenege/benefits, involvement, social, and recognition. The middle tertile, moderate exercisers (n=38, exercised between 5.0 and 6.99 hours per week) ranked fitness and challenge/benefits as highest, followed by medical, involvement, social, and recognition. The frequent exercisers (n=99, exercised 7.0 or more hours per week), or those who report the most leisure time exercise and physical activity reported fitness, medical and challenge/benefits as the three top reasons for exercising, followed by social, involvement and recognition.

Based on the number of days per week that participants were physically active or exercising to the point of breathing hard or sweating the lowest tertile (n=107, 2.99 or less days per week) reported reasons for exercising in the following order: fitness, medical, challenge/benefits, social, involvement, and recognition. The middle tertile (n=55, 3 to 4.99 days per week) differed slightly with fitness and medical being the top two reasons reported followed by challenge/benefits, involvement, social, and then recognition. The most frequent exercisers, or the highest tertile (n=94, greater than 5 days per week) again differed slightly from the bottom two tertiles and reported fitness and challenge/benefits as the highest two reasons, followed by medical, involvement, social, and recognition. Clear trends in all tertile groups indicate that fitness is the most important reason for engaging in regular physical activity, with recognition as the least important reason.

Kurtosis for the entire sample suggests a relatively flat curve for social, recognition, medical, and involvement factors with a more peaked curve for fitness and challenge/benefits, indicating a fairly normal sample distribution. Skewness suggests a slight shift toward the left, or smaller numbers for all the six factors except recognition. Recognition was skewed to the right, indicating that there were more responses for this factor being not at all or somewhat important to their participation in exercise. For within factor and percentage rankings see Table 1.

Summary of Analysis of Variance

Differences based on gender. Mean scores for each of the six factors differed only slightly between males and females, as indicated in Table 2. The largest difference in

factor means between genders was found within the social factor, the average for females being approximately 0.14 higher than males and the medical factor with females being 0.12 higher than males. No other factors were significantly different between genders.

Differences based on exercise time. For analysis of differences in reasons based on exercise frequency, subjects were divided into tertiles for number of hours exercised per week. There were significant differences in reasons given for exercise for three factors: social, fitness, and challenge/benefits, F=4.473, p=0.012; F=13.508, p<.001; and F=7.168, p=.001, respectively (see Table 3). A Tukey HSD post hoc analysis indicated that those in the highest fitness tertile, or frequent exercisers ranked social, fitness, and challenge/benefits significantly higher than those in the lowest tertile. The other three factors, recognition, medical, and involvement failed to show significance between the lowest and highest tertiles.

In five of the six factors, the middle tertile, or moderate exercisers did not differ significantly from the lowest and highest tertiles. Fitness was the only factor that showed a significant difference between the lowest and middle tertiles of exercisers (p=.021), but failed to show significance between the middle and highest exercise tertiles.

Differences based on exercise days. The analysis of differences in reasons for exercise based on reported exercise days showed slightly different results than differences based on exercise time. Tertiles were created based on reported number of days per week in which subjects engaged in exercise that caused sweating or hard breathing. Results showed that there was a significant difference in reasons for participating in exercise for the fitness factor, F= 13.978, p<.001. Those who were

frequent exercisers only reported the fitness factor significantly higher than those in the rare exercise group, there were no significant differences between the low and high exercise groups with the remaining factors (see Table 4).

Bivariate Correlations

Each of the six PMQOA factors were compared with BMI, fitness perception, activity perception, exercise time, exercise days, blood pressure, current smoking status, past smoking status, and age (see Table 5). Fitness perception and activity perception were derived from self-reported descriptive questions in which participants compared their fitness and activity to others their age.

Fitness perception showed moderate positive correlations with exercise time and exercise days (r=.45 and r=.37, respectively), meaning that those who exercise more frequently perceive themselves as more fit and active. Fitness perception also showed a positive moderately strong correlation with the fitness factor (r=.44) and a weak negative correlation with recognition (r=-.17) and challenge/benefits (r=-.30). All of these factors were significant at p=0.01.

As exercise time and number of exercise days increase, results showed that BMI tended to decrease significantly (r=-.13, p=.04 and r=-.15, p=.02, respectively) and fitness perception increased (r=.45, p<.001 and r=.37, p<.001, respectively). Exercise time and days also had positive weak to moderate correlations with three of the factors; fitness, recognition, and challenge/benefits. Both exercise time and exercise days had the strongest significant correlation with fitness and the lowest significant correlation with recognition.

Discussion

This study investigated the various potential reasons for exercise in an elderly active population. Findings show that different exercise frequency groups give varying reasons for engaging in regular exercise. Those who exercise most frequently rate social, challenge/benefits, and fitness reasons higher than less frequent exercisers.

Data from NHANES III indicate that participants were well under the national BMI average of 29.2 for adults ages 50-74 (Ogden, Fryar, Carroll, & Flegal, 2004). U.S. Government statistics indicate that from 1976 to 2004, adults considered overweight by BMI measures has increased from 15.0% to 32.9% (Center, 2004). Athletes in the Senior Games represent a possible unique group of individuals who are active in their later years. Considering this, it is worth trying to understand the reasons these active seniors give for regular participation in physical activity and exercise.

Social reasons have been cited in previous research as being especially important to habitual exercisers (Annesi, 2004; Brassington, Atienza, Perczek, DiLorenzo, & King, 2002; Paxton et al., 1997). As expected, exercising for social reasons proved more important to females than males, similar to previous research, even though females reported slightly less vigorous exercise time per week (approximately 0.2 hours less) and fewer exercise days (Kirby et al., 1999). Age, independent of gender showed a positive weak correlation with the PMQOA factor involvement, suggesting that the more advanced in age, the more important social and involvement reasons may become.

Grove and Spier (1999) found that for those who value the social aspect of physical activity, the ideal number of individuals to exercise with is between 12 and 20,

which is about the size of some team-based sports. Taking this into account, the high activity levels of participants at the Senior Games may be due to the strong social support, challenging sports, and team unity they enjoy.

The PMQOA factor challenge/benefits proved significantly more important to the frequent exercise group versus the rare exercise group ($p<.001$), suggesting that challenging activities may help older adults become frequent exercisers. Because both the social factor and challenge/benefits were found to be highly significant, consideration should be given to include group activities when designing programs and recreational activities for older adults. Gender differences should also be taken into account to increase participation and retention.

In previous studies, fitness, or exercising for improved physique has also been reported as important. It tends to be somewhat more important in men (Schuler, Boxon-Hutcherson, Philipp, Ryan, Isosaari, & Robinson, 2004) but the current study found it to be slightly more important in women. In addition, fitness was found to be a more important reason for exercising in the frequent versus rare exercise groups. Four of the five items in the fitness factor were the highest ranked reasons for engaging in regular exercise. McMurdo (2000) indicated that some elderly refrain from exercise, thinking they will only receive benefits from continuous, vigorous exercise. However, research indicates that many benefits can be gained from engaging in regular, moderate exercise (Pate, Pratt, Blair, Haskell, Macera, Bouchard, et al., 1995). Responses to items such as "I want to be physically fit," "I want to stay in shape," and "I want to improve my fitness" may represent desires for long term habitual exercise and higher fitness levels.

Contrary to expectations, the medical factor was not significantly different for any of the fitness tertiles although there was significant difference between genders, females ranking it higher. This may be due to the fact that many of the participants are already comparatively active and may not have as many adverse medical conditions as non-athletes or less active. One limitation in this factor may have been that the questions were too subjective such as "I like to exercise to prevent/assist back pain" and "I like to exercise to keep my joints mobile." If a participant had neither of these conditions, their results may not be reflected in the medical factor as important. Also, the means were the same for both the rare and frequent exercise groups, suggesting that this factor may be fairly important to all participants and would thus fail to show a significant difference between exercise frequency groups.

Correlations between BMI, fitness perception and exercise frequency with the medical factor were not found. Bradley, Kolt and Williams (2005) reported that some who exercise regularly indicate that prevention of future disability and medical problems serve as their stimulus. Other studies indicate that exercise decreases feelings of loneliness and isolation that older adults may feel and that it can decrease depression while improving mental health (McMurdo, 2000; Fife, 1997).

In assessing exercise frequency, perhaps it is best done by reporting weekly exercise time rather than days. Some may exercise for long segments of time only a few times per week while others exercise for a little time every day. These two individuals would be categorized differently and may be misrepresented by being put into different exercise groups based on how they report their physical activity. The analysis of variance

looked at differences based on both exercise time and exercise days, but found very different results in reasons for exercising between tertiles.

For each of the PMQOA factors, the means for the frequent exercise tertile was higher than the rare exercise tertile. The only exception to this was with the medical factor, where both the rare and frequent exercise groups had a mean of 2.25. Although the analysis of variance indicated significant differences in reasons for participating in exercise between exercise frequency tertiles, all six reasons were more important to the frequent exercise tertile, suggesting that these individuals may be more motivated all around.

Social, fitness, and challenge/benefits were the significant determinants for frequent exercise. Recognition proved insignificant, indicating that in this population subjects did not value outside acknowledgement or credit as important for exercise participation. Epstein (1998) observed that many physical activity and exercise studies have been done that focus on just one type of factor intervention, and there is a need to target multiple levels of one's environment such as behavioral, psychological, social, physical, etc. The combination of challenge/competition, social, and fitness reasons that subjects reported as being the most important to them may explain the type of participants in the Senior Games well. Creating stimulating, moderately vigorous group activities may be one formula for increasing regular exercise participation for older adults.

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Table 1 Within Factor Means and Percentage Rankings

Factor	*Factor Means*	*SD*	*%*	*Rank*
Factor 1 (Social)	2.023	.58		
I want to be with my friends			33.5	13
I like the company			30.0	17.5
I like the social aspects			27.3	19
I like being part of a group			25.8	21
I like to meet new friends			17.7	24
Factor 2 (Fitness)	2.754	.34		
I want to exercise or play sport to keep healthy			85.8	1
I want to be physically fit			82.7	2
I want to stay in shape			80.8	3
I want to improve my fitness			75.4	4
I like to get exercise			62.7	7.5
Factor 3 (Recognition)	1.662	.44		
I like the rewards			37.3	10
I want to get rid of energy			8.8	26
I want to be noticed for what I do			6.5	27.5
I like to feel important			6.5	27.5
I want to be popular			3.5	29
Factor 4 (Challenge/Benefits)	2.293	.42		
I like to have fun			64.2	6
I like the activity			58.8	9
I like the challenge			35.8	11.5
I like to do something I'm good at			32.7	14
I want to learn new things			32.3	15
I like to exercise/play sport for relaxation			30.0	17.5
I like the excitement			26.2	20
Factor 5 (Medical)	2.256	.45		
I like to exercise/play sport to keep my joints mobile			68.1	5
I like to exercise/play sport for medical reasons			62.7	7.5
I like to exercise/play sport to prevent/assist back pain			30.8	16
I like to exercise/play sport to alleviate pain			14.6	25
Factor 6 (Involvement)	2.044	.51		
I like to have something to do			35.8	11.5
My family and friends want me to exercise/play sport			23.8	22
I like to get out of the house			21.2	23

Note: Percentage indicates the percentage of participants that ranked each motive as very important to their participation in exercise.

Table 2 Gender ANOVA

Factor	*Mean*		*SD*		*Effect Size*
	Males	Females	Males	Females	
Social	1.96*	2.10*	.54	.63	-.24
Fitness	2.73	2.79	.37	.28	-.30
Recognition	1.66	1.67	.42	.46	-.02
Challenge/Benefits	2.29	2.29	.43	.40	0.0
Medical	2.21*	2.33*	.47	.42	-.22
Involvement	2.01	2.09	.49	.54	-.20

*Significant at the .05 level

Table 3 ANOVA Based On Exercise Time

Factor/Exercise Group	*Mean*	*SD*	*F*	*p-value*	*Effect Size*
Social			4.473	0.012*	
Rare	1.93	0.63			-.39
Frequent	2.16	0.53			
Fitness			13.508	<0.001*	
Rare	2.64	0.39			-.71
Frequent	2.87	0.22			
Recognition			2.215	0.111	
Rare	1.62	0.40			-.28
Frequent	1.74	0.45			
Challenge/Benefits			7.168	0.001*	
Rare	2.19	0.42			-.52
Frequent	2.40	0.38			
Medical			0.216	0.806	
Rare	2.25	0.46			0.0
Frequent	2.25	0.43			
Involvement			0.541	0.541	
Rare	2.00	0.52			-.16
Frequent	2.08	0.51			

*Significant at the 0.05 level

Table 4 ANOVA Based On Exercise Days

Factor/Exercise Group	*Mean*	*SD*	*F*	*p-value*	*Effect Size*
Social			0.623	0.537	
Rare	2.06	0.61			.05
Frequent	2.03	0.59			
Fitness			13.978	<0.001*	
Rare	2.64	0.41			-.71
Frequent	2.87	0.19			
Recognition			1.971	0.142	
Rare	1.62	0.41			-.28
Frequent	1.74	0.46			
Challenge/Benefits			2.062	0.129	
Rare	2.25	0.41			-.26
Frequent	2.36	0.43			
Medical			0.209	0.811	
Rare	2.26	0.47			-.04
Frequent	2.28	0.44			
Involvement			0.500	0.607	
Rare	2.05	0.51			.02
Frequent	2.04	0.51			

*Significant at the 0.05 level

Table 5 Bivariate Correlations

Factor	*BMI*	*Fitness Perception*	*Active Perception*	*Exercise Time*	*Exercise Days*	*Current Smoker*	*Past Smoker*	*Age*
Fitness	-.11	.44**	.07	.38**	.38**	-.05	.04	.04
Recognition	-.10	-.17**	.03	.17**	.13**	-.04	-.10	-.01
Challenge/Benefits	-.15**	.30**	.09	.25**	.16**	-.03	.14*	.06
Medical	-.05	.05	.08	.01	.02	-.06	-.01	.02
Involvement	-.03	.04	.05	.09	-.005	-.04	-.04	.17*
Social	-.15*	.14*	.05	.15*	.003	.02	.12	.03

* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level
The current table was extracted from the full correlation matrix and was reduced for space reasons.

Appendix A

Prospectus

Chapter 1

Introduction

The benefits of regular exercise are well established; yet over two-thirds of the adults in the United States are not regularly active, and about one-third are completely sedentary (Center, 2006; Dishman, 1994b). It is well known that exercise decreases the risk for many potentially fatal chronic diseases such as reducing the incidence of stroke, hypertension, type II diabetes, colon and breast cancers, and obesity (Armstrong, Balady, Berry, Davis, Davy, Davy, et al., 2006). In addition to prolonging the quantity of life, exercise enhances the quality of life by improving cardiovascular and respiratory function; increases performance at work; increases feelings of well-being; decreases stress, anxiety, and depression; increases HDL cholesterol; and reduces total body fat, blood pressure, and insulin needs (Armstrong, 2006). In regard to the elderly, exercise is also shown to reduce the risk of disability later in life (Shephard, Kavanagh, Mertens, Qureshi, & Clark, 1995).

The U.S. Department of Health and Human Services' document, Healthy People 2010 defines a healthy life as one in which "individuals have a full range of function from infancy through old age, allowing them to enter into satisfying relationships with other people and to work and play. Currently, the average baby born can expect to live 77 years, but only 64 of those years will be considered healthy" (US, 2000a, p. 5). The first objective/goal listed in Healthy People 2010 is to "Increase quality and years of healthy life," (p. 9). The 'quality' of life for the elderly is determined not just by physical health, but by psychological health, social relationships, level of independence, and one's

environment. Healthy People 2010 defines three areas of measurement of quality of life: expected years in good or better health, expected years free of activity limitations, and expected years free of selected chronic diseases, (US, 2000b).

It is perplexing to consider why so many individuals, both young and old, are physically inactive despite the numerous health benefits. Many people identify barriers such as lack of time or resources as explanations for why they do not exercise. "The perception of barriers, or costs to exercise, reduces the probability of performing the behavior even when attitudes towards exercise are favorable" (Lee, 1993, p. 326). Dishman (1994a) indicated that lack of knowledge of the benefits of regular physical activity, lack of access to activity programs, and lack of social support were all barriers that prevented the elderly study population from exercising. Barriers are something that all must face, so why are some so successful at overcoming them while others are not? What factors determines whether an individual will consistently exercise or not?

Extensive research on motivations for exercise have been done by many scientists in the field. Research findings state that some of the main reasons given for adopting regular exercise are: social, fitness, challenge/benefits, medical, and involvement (Kolt, Driver &Giles 2004). Other research has been conducted as to what factors lead to long-term physical activity adherence. Despite these findings, further research is needed to conclude why some exercise more often than others. The current study is a replication of a study conducted by Kolt , Driver, & Giles (2004), entitled "Why older Australians participate in exercise and sport," which appeared in the Journal of Aging and Physical Activity in 2004. Subjects in this study were recruited from recreation and sports clubs in

the area and were given the PMQOA (explained later). This study will determine the reasons for exercise based on different physical activity levels.

Statement of the Problem

There are various psychological and socio-environmental factors that influence one's decision to be a habitual exerciser. By looking at those individuals who are currently getting the recommended amounts of exercise, we can deduce common patterns and characteristics from which to draw conclusions. This is a descriptive study which will describe the physical activity behaviors of senior athletes based on tertiles of physical activity levels. Although causation cannot be determined from descriptive research, factual information regarding current patterns of habitual exercisers can be established. The purpose of this study is to build on previous research, to determine the reasons for persistent patterns of exercise behavior in a senior athlete population based on physical activity level. By gaining greater understanding of the traits and characteristics of older individuals, we may be able to help the younger inactive population adopt more active lifestyles.

Research Question

1. What are the reasons for participation in exercise in a senior athlete population?
2. To what extent does exercise frequency correlate with reasons given for exercise?

Assumptions

1. The PMQOA is a comprehensive questionnaire assessing all possible reasons identified for exercise participation.

Limitations

1. Conclusions can be drawn only from the given factors represented in the PMQOA questions. This will be the first time an online version of the questionnaire will be tested.
2. Participants may not answer all questions completely, in which we cannot use that questionnaire in the analysis.
3. Exercise frequency, intensity, and duration will be self-reported, which may not be entirely accurate.

Delimitations

This pilot data was collected in collaboration with Dr. Hager's carotid artery screening study. Those who filled out the PMQOA received a free carotid artery assessment. Participants were only included in the study who were senior games participants, were 50 years or older and who were regularly physically active, determined as exercising or participating in physical activity to the point of breathing hard and/or sweating at least 4 times per week, based on their reported physical activity on the questionnaire. Not everyone who receives the email will take the time to retake the questionnaire online so there will be a degree of attrition from those who took the questionnaire originally for pilot data and those who will take the online version.

Definition of Terms

1. Regular/habitual/chronic exerciser: An individual who participates in exercise or physical activity regularly, defined as at least 4 times per week for at least 15 minutes.

2. Elderly/Older adult: Individuals over 50 years of age.
3. Senior Athlete: Elderly (≥50 years of age) who are actively involved in sport and exercise. They are classified by their habitual participation in high-intensity exercise.

Chapter 2

Review of Literature

The American population is aging, thus contributing to the growing population of elderly who exercise regularly (Center, 2006). From 1998-2003, the percentage of inactive elderly decreased, while those reporting some leisure-time activity and regular leisure-time activity increased (2006). Although we have seen an increase, Dishman (1994b) indicates that over half of our nation's seniors do not exercise and do not have intentions of doing so. Although we know that physical capacities tend to decline with age, studies show that the effects of aging can be either perpetuated or treated with an active lifestyle (Lowenthal, Kirschner, Scarpace, Pollock, & Graves, 1994). Competitive sport as well as recreational physical activity is becoming more popular in the elderly and many local and national events promote physical activity in the elderly. Although many participate primarily for friendly, non-competitive activity, some develop their skills to high levels and are considered master athletes. Senior athletes are classified by their habitual participation in frequent physical activity.

Many senior athletes have chosen active lifestyles and enjoy the benefits of regular physical activity. A study by Paffenbarger, Hyde, Wing, Lee, Dexter, and Kampert (1993) compared elderly who were formerly college athletes with those who had become active later in life. Results showed that those who adopted vigorous activity later in life had the same morbidity and mortality as those who stopped their sporting activities after college, thus showing that it is never too late to adopt exercise and gain from its benefits. Some seniors indicate that exercise is one of their major goals for their

leisure time (Dishman, 1994a). There are many determinants that may explain exercise adherence in the elderly. Understanding the psycho-social and psychological influences such as motivations, attitudes, knowledge, behaviors, and social support that drive the habitually active elderly can help researchers understand how to help the younger inactive population.

Scholars in the field have attempted to study the various determinants of physical activity and exercise in order to discover why some become habitual exercisers, yet more research is needed to determine specific influences. A study was conducted by Boyette, Lloyd, Boyette, Watkins, Furbush, and Dunbar, et al. (2002) in which experts in the field of physical activity adherence in the elderly were interviewed. Results indicated that biomedical status, past exercise participation, education, and socioeconomic status were determinants that were most predictive of initiation and adherence to an exercise program. Other factors that proved non-significant were smoking status, age, ethnicity, occupation, and gender (2002).

Both Baranowski, Anderson, and Carmack, (1998) and King, Rajeski, and Buchner (1998) conducted review articles assessing the current research to date on physical activity interventions. Their conclusions were that more research needs to be done on the predictors of physical activity participation in order to create effective intervention methods. Epstein (1998) observed that because many studies have been done that focus on just one type of intervention, physical activity interventions need to be targeted at multiple levels of one's environment such as behavioral, psychological, social, physical, etc.

Motivations

Motivation remains a very strong predictor for behavior in any pursuit and research literature supports this. Some claim that motivation is the best discriminator between those who adhere to or drop out of an exercise program (Dishman, Ickes, & Morgan, 1980). Bandura's theory of self-efficacy (1977) has been the theoretical construct for many studies on exercise participation and adherence. Self-efficacy, or one's degree of perceived capability or confidence to reach a goal, is shown to be significant in predicting exercise adoption.

Garcia and King (1991) also observed that self-efficacy influenced exercise persistence when an individual experiences difficulties. Perceived exertion, enjoyment, and convenience are a few of the significant components of one's self-efficacy as it relates to exercise. Shephard, Kavanagh, Quershi, and Clark (1995) administered a questionnaire for masters athletes and determined that health benefits and increased quality of life were the highest reasons for participating in older athletic competitions. This study also found that, in comparison to their non-athletic peers, participants had more frequent medical exams, slept better, and experienced greater resilience to smoking remission (1995). Other studies indicated that motivation to engage in physical activity tends to improve as participation improves (Song, June, Kim, & Jeon, 2004).

Many studies have been conducted on motivations for exercise in older women (Paxton, Browning, & O' Connel, 1997; Kirby, Kolt, Habel, & Adams, 1999). The top reasons older women identified as reasons for participating in exercise were for physical fitness, social interactions, mental health, and enjoyment. Schuler, Boxon-Hutcherson,

Philipp, Ryan, Isosaari, and Robinson (2004) determined that improved physique is a strong predictor of exercise motivation in older women. Body shape satisfaction was found correlated with activity level (2004). Because these studies are not generalizable to the whole senior population, more research is needed assessing the determinants of exercise for both male and female senior athletes.

Deci and Ryan's (1985) self determination theory suggests that humans are intrinsically motivated to exercise both their mental and physical capacities. One is intrinsically motivated to exercise if they engage in physical activity for gratification or enjoyment, without an obvious external incentive. Ryan, Frederick, Lepes, Rubio, and Sheldon (1997) determined that intrinsic motivation proves critical in participating in regular, long-term exercise. One who is intrinsically motivated is more likely to feel energized, confident, and fulfilled in one's activity than one who is extrinsically motivated. Those who exercise for extrinsic reasons are less likely to adhere to long- term exercise (1997). In addition, studies show that highly motivated individuals remain physically active for life unless physical ailments prevent them from doing so. One study showed that exercise termination in the habitually active elderly is primarily due only to health problems that prevent them from continuing exercise, not from lack of or decreased motivation (Schmidt, Gruman, King, & Wolfson, 2000). Kolt, Driver, and Giles (2004) showed that one reason seniors participate in exercise and sport is for prevention of adverse medical conditions such as preventing or alleviating back pain and to maintain mobile joints. The desire to improve health and age better have also been

identified as determinants of exercise (Cohen-Mansfield, Marx, & Guralnik, 2003; O'Brien Cousins, S., 2001).

Attitudes

It has been hypothesized that attitude influences behavior, showing that a person's intentions lead to behavior, depending on social factors. Hausenblaus, Carron, and Mack (1997) observed that attitudes and intentions related to exercise have more effect on actual exercise behavior in comparison to social influences. Positive beliefs and perceived ability to exercise also fuel intentions but these findings need duplication, especially among the elderly population. Melillo, Williamson, Futrell, and Chamberlain (1997) assessed a tool that observed perceptions regarding physical activity and exercise. They found that physical fitness, barriers, and motivators can be predictive of exercise frequency. In general, aging tends to decrease positive attitudes about exercise, yet attitudes regarding the value and importance of exercise are a strong predictor of adherence (Rhodes, Martin, Taunton, Rhodes, Donnelly, & Elliot 1999). Considering the research findings on intrinsic motivation, increased emphasis on the importance of exercise and its benefits may increase the likelihood for persistence in exercise.

Knowledge

Studies show that knowledge of health and exercise does not directly determine exercise adherence in the middle-aged (Dishman, 1994a); however, studies on the elderly show education level and exercise frequency to be strongly correlated (Clark, 1995). Howze, Smith, and DiGilo (1989) suggested that knowledge of exercise skills and benefits are associated with participation and adherence in the elderly. Since knowledge

increases with experience and exposure, it is hypothesized that there may be a relationship between early exposure to exercise and long-term adherence (Kasch, 2001). It is suggested that increased knowledge and participation can increase self-efficacy, thus improving adherence (Prochaska & DiClemente 1979). A study conducted by Resnick, Palmer, Jenkins, & Spellbring (2000) indicated that staying in shape, good health, psychological well-being, enjoyment, decreasing stress, or losing weight were all benefits that were important to participants and in which they expected to gain improvements.

Behaviors

Past experiences and behaviors with exercise often effect exercise commitment. One study showed that early positive experiences and recent involvement in exercise is significant in predicting maintenance (Valois, Shephard, & Godin, 1986). This study also emphasized the benefit of making exercise a habit for both short-term and long-term adherence. Aarts, Paulussen, and Schaalma (1997) reinforced these findings by determining that habit is one of the best predictors of exercise intentions and maintenance. They determined that those who make exercise a habit in their lives early on will be more likely to adhere throughout their lives, despite barriers. In addition to internal motivations, the influence of peers has a considerable effect on adherence in the elderly.

Social support

The assumption that social support may increase exercise enjoyment and long-term maintenance is widely accepted, although the degree to which this factor influences adherence is not completely clear (Brassington, Atienza, Perczek, DiLorenzo, & King,

2002; Annesi, 2004). McCauley, Jerome, Marquez, Elavsky, and Blissmer (2003) showed that positive social interaction and support increases positive experiences and creates greater self-efficacy, thus leading individuals to be more likely to engage in long term exercise. Positive encouragement from one's spouse, family, friends, and co-workers has a large psychological impact on motivations, attitudes, and therefore behaviors. A study by Kolt, Driver, and Giles (2004) showed that the social and involvement aspects of exercise were highly predictive of maintenance for older women. Additionally, because competitive and team sports involve social interaction, it is thought that involvement with teams enhances motivation and increases participation. Grove & Spier (1999) conducted a study assessing the strength of social interaction in exercise adherence. They found that the highest adherence was found in locations that were easily accessible and in groups of about 12 to 20 participants. Also, participants enjoyed being in control of what activities they would participate in. Media, such as video tapes, proved to be effective in supporting adherence. Seniors enjoyed working out at home to the video because they could see each exercise performed and hear the recommended number of repetitions.

There are various barriers to exercise identified by those in all age groups, including lack of time, socioeconomic status, lack of resources, weather, living situation, and little understanding of the principles of exercise. Clark, Patrick, Grembowski, and Durham (1995) determined that those with higher socioeconomic status were more likely to engage in persistent exercise. Nies and Kershaw (2002) added that higher socioeconomic status contributed to physical activity adherence by improving relapse prevention, increasing access to exercise facilities, and resilience to obstacles.

As the population ages, competitive sport for older adults is becoming more common. For example, 2007 marks the 20th year of The Huntsman World Senior Games in St. George, Utah, with participation increasing each year. Many studies have observed motivations for exercise in the young adult and adult populations, yet motivations identified specifically in senior athletes are not yet clearly defined. For example, Kirby, Kolt, and Habel (1998) determined that older Australians involved in sport were motivated to exercise for social reasons and achievement more than for fitness, yet another study by Bradley, Kolt, and Williams (2005) determined that physical fitness and health were the top motives identified by senior athletes.

Despite the wide range of findings on motivations and determinants of exercise in the elderly, more replication studies are needed to supplement what has already been done. The Participation Motivation Questionnaire for Older Adults (PMQOA) is an instrument designed to identify the reasons for participation in sport and exercise in older adults. It has been used in four previous studies (Kirby et al., 1998; Kirby et al., 1999; Bradley et al., 2005; Kolt et al., 2004). It's content and validity were established in Kolt et al., 2004 and Chronbach's alpha showed that the PMQOA had a reliability of 0.89. It has been used at the World Masters Games in Melbourne, Australia as well as in retirement neighborhoods and gyms.

Chapter 3

Methods

Subjects and Recruitment

The subjects for this study will be participants in the Huntsman World Senior Games in St. George, Utah on October 10th-11th, and 17th-18th, 2007. The only qualification for the games is to be at least 50 years of age, although many participants are involved into their 80's and even 90's. There is no required skill level and some participants come for friendly competition while others come for competitive sport. Participants come from all around the world to participate in the games and represent a unique group of senior athletes. Many of them have been involved in athletics and exercise since youth. They have made exercise an integral part of their current life and many enjoy a full range of function into their later years, thus making them an ideal group to draw conclusions from.

Approximately 675 participants voluntarily agreed to take an exercise participation questionnaire as part of the health screening and for the purpose of gathering pilot data. The questionnaire was filled out prior to receiving a carotid artery screening as part of the free health testing provided at the games. Athletes participating in any of the sports at the games were permitted to participate. No incentives were offered. Participants gave their street address and email address for further contact and follow up. Data collection for the present study will consist of contacting participants via e-mail after completion of the games and requesting that they complete the Participation

Motivation Questionnaire for Older Adults (PMQOA) and two questions regarding their regular physical activity and exercise habits via an online survey.

Instrumentation

The Participation Motivation Questionnaire for Older Adults (PMQOA) assesses reasons for participation in exercise. The PMQOA was created through focus groups of gerontological and physical activity researchers and its content validity and reliability has been cited in previous studies (Kolt, Driver, Giles, 2004; Kirby, et al., 1998, 1999). It was initially created as the Participation Motivation Questionnaire that was used for youth participating in sports, but was later modified for older adults (Gill, Gross, & Hunddleston, 1983). Permission to use the questionnaire and to create an online version was obtained from the creator of it, Dr. Gregory Kolt in September, 2007. The questions assess individual's perceptions and beliefs about why they participate in competitive sport. The PMQOA will ask 30 questions about various motivations for exercise such as for health or social reasons, to prevent disability, to relieve pain etc. Each item is rated on a three-point Likert scale (not at all important, somewhat important, and very important). The instructions for the questionnaire are for participants to indicate how important each statement is in relation to their participation in exercise.

Exercise frequency will be determined by two descriptive questions. The first question is an open ended question: How much time per week do you participate in physical activity or exercise that make you breathe hard or sweat, such as brisk walking, jogging, bicycling, swimming, or other aerobic activities? Participants will indicate how much time in hours, to the nearest half hour, they do this per week. The second question

is: How many days per week are you physically active or exercising to the point of breathing hard or sweating? The options are 0-7 days per week. The results will be divided into tertiles of exercise frequency: rarely, sometimes, and often.

Procedures

Pilot data was collected through the free health screenings that were provided each Wednesday and Thursday of the two weeks of the games. Participants signed up for an appointment time to receive a carotid artery screening and received a consent form, information sheet, and the PMQOA in a small packet. Before receiving the screening, participants were required to fill the packet out completely. Those who agreed to participate gave consent to be a research subject and for their answers to be used in this study. Permission to gather pilot data was approved by the Hunstman World Senior Games Board of Directors and the IRB at Brigham Young University. Consent for further contact and for the online PMQOA will be obtained from the IRB at Brigham Young University.

Those that provided an email address will be sent an email thanking them for their participation. They will also be asked to fill out the PMQOA again. Participants will click on a link that will take them to an online version of the PMQOA and will give simple instructions for completion. Results from their online PMQOA will be compared to the pilot data collected at the games in order to establish reliability between the written version and the online version of the questionnaire.

Analysis

A factor analysis was conducted in previous studies to assess the underlying structure of the PMQOA and to identify general categories of factors that influence habitual physical activity. Factor analysis broke down the various motives for persistent exercise into six factors: social, fitness, recognition, challenge/benefits, medical, and involvement.

To establish the reliability of the PMQOA, Cronbach's alpha will be calculated to indicate whether the questionnaire as a whole is reliable and whether each factor is reliable for the overall sample. Correlation subscales will be used to determine that each question is asking an independent determinant factor.

The pilot data will be compared to the answers from the online PMQOA that will be filled out about two months after the games. A reliability coefficient will be calculated from the pilot data and the online questionnaire data to determine the consistency of the PMQOA data.

Additional analyses will be conducted to determine the extent to which frequency of exercise correlates with reasons given for exercise in the elderly. Frequency of exercise will be divided into tertiles. Tertile categories will be compared using ANOVA to determine whether there are any significant differences in reasons for participating in exercise between the tertile (rarely, sometimes, and often) activity groups. The analyses will be conducted using the six factors from the factor analysis as the dependent variables. The independent variables are the three frequency groups: rarely, sometimes, and often.

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Appendix A-1

Informed Consent

Informed Consent

Senior Games Participants-

Thank you very much for your participation in the health screenings at the Games, we hope you had a pleasant experience. We appreciate your contact information for further research. A lot of beneficial research has resulted from your participation. I am contacting you as part of a follow-up study to the carotid artery screening that you participated in last year. You may not remember, but you completed a short survey as part of your participation in the carotid artery screening. The survey only took you about 3 minutes to complete.

I am sending this email to enlist your help for additional research and would like you to complete part of the survey again, only this time you will complete the questions online.

By clicking on the link below you will be taken to a website where you can complete the survey.

Following the link is an informed consent form that contains more information regarding the study. Your participation indicates that you consent to be a research subject.

http://new.qualtrics.com/SE?SID=SV_dgRdSIGMQGfzDlG&SVID=Prod

CONSENT TO BE A RESEARCH PARTICIPANT

Introduction: We are contacting you to enlist your participation in further research on the questionnaires you filled out prior to the carotid artery screenings at the Games. This research study is a thesis project being conducted by Debbie Fife, a graduate student at Brigham Young University, and Professor Ron Hager, to determine motivational reasons for exercise.

Procedure: By simply clicking on the link below, you will be taken to the online version of the Participation Motivation Questionnaire for Older Adults (PMQOA). This is identical to the written questionnaire you filled out at the carotid artery screening station. We want to do some different statistical analyses and would appreciate your willingness to fill it out one more time. It consists of 34 questions and will take approximately 3-5 minutes to complete. Four of the questions will ask how often you exercise to the point of breathing hard or sweating. The remaining 30 will observe your reasons for participation in physical activity.

Risks/Discomforts: There are minimal risks for participation in this study. However, you may feel some discomfort when answering questions about personal physical activity habits, including questions relating to reasons for participation in physical activity and exercise.

Benefits: There are no direct benefits to you, although your answers will help us find ways to increase physical activity in our society.

Compensation: You will not receive any type of compensation for participation in this study.

Participation: By completing the online questionnaire, you give your consent to be a research subject in this study. Participation in this research study is voluntary. You have the right to withdraw or refuse to participate entirely.

Confidentiality: All information provided will remain confidential and will be kept in a locked office. Only those directly involved with the research will have access to it. Your information will not be used for any more contact besides this questionnaire.

Questions about the research and your rights as a research participant: If you have questions regarding this study, you may contact Professor Ron Hager at (801) 422-1183, hager@byu.edu. If you have questions you do not feel comfortable asking Professor Hager, you may contact Dr. Christopher Dromney, IRB Chair at (801) 422-6461, christopher-_dromney@byu.edu.

We appreciate very much your time and participation. This research will hopefully help to improve the health of our nation. Please click on the link below and complete your questionnaire as soon as possible. If both you and your spouse share this email address, please each fill out the survey. If we have not received your completed survey in a week's time, we will send a reminder email. Again, thank you *so very much* for your participation.

http://new.qualtrics.com/SE?SID=SV_dgRdSIGMQGfzDlG&SVID=Prod

Appendix A-2

Participation Motivation Questionnaire for Older Adults

Participation Motivation Questionnaire for Older Adults (PMQOA)

Below are a list of reasons why adults participate in exercise and physical activity. Please read **each one** and tick whether this reason is **not at all important** for you participating in exercise or physical activity, **somewhat important**, or **very important**.

		Not at all important	Somewhat important	Very important
1	I want to improve my fitness	❑	❑	❑
2	I want to be with my friends	❑	❑	❑
3	I like to be physically active to keep healthy	❑	❑	❑
4	I want to get rid of energy	❑	❑	❑
5	I want to stay in shape	❑	❑	❑
6	I like the excitement	❑	❑	❑
7	I like the company	❑	❑	❑
8	My family and friends want me to be physically active	❑	❑	❑
9	I want to be physically active for medical reasons	❑	❑	❑
10	I like to meet new friends	❑	❑	❑
11	I like to do something I'm good at	❑	❑	❑
12	I want to release tension	❑	❑	❑
13	I like the rewards	❑	❑	❑
14	I like to get exercise	❑	❑	❑
15	I like to exercise to alleviate pain	❑	❑	❑
16	I like the activity	❑	❑	❑
17	I like the social aspects	❑	❑	❑
18	I like to get out of the house	❑	❑	❑
19	I like to be physically active to keep my joints mobile	❑	❑	❑
20	I like to feel important	❑	❑	❑
21	I like being part of a group	❑	❑	❑
22	I want to be physically fit	❑	❑	❑
23	I want to be popular	❑	❑	❑
24	I like the challenge	❑	❑	❑
25	I want to be noticed for what I do	❑	❑	❑

26	I like to have fun	❑	❑	❑
27	I want to learn new things	❑	❑	❑
28	I like to have something to do	❑	❑	❑
29	I like to be physically active to assist or prevent back pain	❑	❑	❑
30	I like to exercise or be physically active for relaxation	❑	❑	❑