Religiosity and Physical Fitness: A Study of Middle-Aged Mormon Men

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RELIGIOSITY AND PHYSICAL FITNESS:
A STUDY OF MIDDLE-AGED MORMON MEN

by

Janette Olsen

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Science

Department of Physical Education
Brigham Young University
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BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a thesis submitted by

Janette Olsen

This thesis has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

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As chair of the candidate's graduate committee, I have read the thesis of Janette Olsen 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

RELIGIOSITY AND PHYSICAL FITNESS:
A STUDY OF MIDDLE-AGED MORMON MEN

Janette Olsen
Department of Physical Education
Masters of Science

Research has related both physical fitness and religiosity to health. This study combined these ideas and examined the relationship between religiosity and physical fitness among middle aged Mormon men (N=110). Mormons are an ideal population for study because of their strict health code. Fitness variables were grip strength, waist/hip ratio, body mass index (BMI) and estimated maximal oxygen uptake (VO_{2max}). A questionnaire assessed level of religiosity and separated subjects into two groups: highly religious (N=35) and less religious (N=14). Moderately religious subjects (N=61) were omitted. A one way ANOVA (between groups design) found no significant differences in fitness variables between groups. Results indicate that fitness and religiosity do not appear to be related among Mormon men. These factors were found to be related among Mormon women (Blakemore,
Therefore, an increase in religiosity may be associated with improved physical fitness for Mormon women, however, based on this study no such association can be made for Mormon men.
ABSTRACT

Research has related both physical fitness and religiosity to health. This study combined these ideas and examined the relationship between religiosity and physical fitness among middle aged Mormon men (N=110). Mormons are an ideal population for study because of their strict health code. Fitness variables were grip strength, waist/hip ratio, body mass index (BMI) and estimated maximal oxygen uptake (VO₂max). A questionnaire assessed level of religiosity and separated subjects into two groups: highly religious (N=35) and less religious (N=14). Moderately religious subjects (N=61) were omitted. A one way ANOVA (between-groups design) found no significant differences in fitness variables between groups. Results indicate that fitness and religiosity do not appear to be related among Mormon men. These factors were found to be related in Mormon women (Blakemore, 1997:16). Therefore, an increase in religiosity may be associated with improved physical fitness for Mormon women, however, based on this study no such association can be made for Mormon men.
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Religiosity and Physical Fitness:

A Study of Middle-Aged Mormon Men

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Religiosity & Physical Fitness in LDS Men

Religiosity and Physical Fitness:

A Study of Middle-Aged Mormon Men

Physical Fitness and Health

Physical Fitness has long been used as a measure of general health and well being (American College of Sports Medicine [ACSM], 1995:4; Pate et al., 1995:403; Shephard, 1995:289; Surgeon General, 1996:4). Religiosity, or religious, commitment has also been shown to have a positive relationship with overall good health (Koenig, 1997:93; Larson et al., 1989:276; Mathews, 1995:111). Recently, the Surgeon General (1996:5) stated that over 60% of the general population is not regularly physically active. This high level of inactivity increases health risks and has a negative impact on individual health, fitness, and all-cause mortality rates (Pate et al., 1995:403). Physical activity level has been one factor linked to fitness level. The relationship between health and variables such as low-fat diet, body composition, cholesterol level, smoking, cardiorespiratory function, and metabolic regulation have been widely studied. Another variable that may affect health is the level of religious commitment.

Religiosity and Health

A religious organization can influence health practices by: 1) providing an environment of social support, 2) discouraging health-destructive behaviors (Idler, 1987:228; Koenig et al., 1994:229), 3) creating a system for finding meaning in life, giving peace, and a sense of well being
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(Ellison, 1991:87; Idler, 1987:228-229), and 4) providing hope for dealing with physical suffering, dying and death (Vanderpool, 1980:14).

A positive relationship has been demonstrated between high levels of religiosity and general physical health. Mathews' (1995:111) review of 212 studies on religious commitment and health concluded that individuals with higher levels of religious commitment experienced less substance abuse, greater physiological health, improved quality of life, and improved medical outcomes. Finally, 75% of the studies showed overall health benefits for those with religious commitment. Ransom et al. (1992:263) found that religiosity was correlated with health for husbands and wives in 225 families in the California Family Health Project. Religiosity also has been shown to enhance emotional well-being and life satisfaction (Hadaway and Roof, 1978:299; Jensen et al., 1993:1158; Levin et al., 1995:S159; Wright et al., 1993:560). Men who attend church at least once a month are less likely to die from arteriosclerotic heart disease and have lower frequencies of tuberculosis (Comstock and Partridge, 1972:668-669). In Scotland, Hannay (1980:683) interviewed 1,344 Glasgow residents. He found that those who attended church at least once a month had fewer self-reported physical symptoms or complaints during the previous two weeks. Those who pray and are active participants in their religions have been found to have better health (Ferraro and Albrecht-Jenson, 1991:199).
Religiosity seems to be inversely related with health-destructive behaviors (Cochran, 1992:102; Oleckno and Blacconiere, 1991:825). Health destructive behaviors include any behavior that negatively affects health, including consuming harmful substances. Brizer (1993:342) found that "measures of alcohol, hallucinogen, and prescription drug consumption had a significantly negative correlation with religiosity scores" among patients at a clinic for the chemically dependent. In a nationwide sample of over 17,000 high school seniors, it was found that high religiosity was related to a lower level of reported alcohol and marijuana use (Amoateng and Bahr, 1986:64).

Numerous studies demonstrate the health benefits associated with high levels of religiosity among the elderly. Mull et al. (1987:154) found that among the elderly, church attendance was positively related to physical health, health status, and functional capacity. Courtenay et al. (1992:54) indicated a significant relationship between religiosity and physical health in older adults. Higher levels of public religious involvement are associated with lower levels of functional disability and depressive symptomatology in elderly individuals (Idler, 1987:232). Idler and Kasl (1992:1074) continued work with the elderly and found that religious involvement exerts a strong positive effect on health and functional capacity.

_Mormon Doctrine about Health_

Members of The Church of Jesus Christ of Latter-day Saints or
Religiosity & Physical Fitness in LDS Men

commonly called Mormon's, are an ideal population for examining the relationship between physical fitness and religiosity. This is because of their lifestyle and the uniform health practices advocated by the church. Mormons may be more physically fit because they have a strict health code called the Word of Wisdom. The Word of Wisdom was originally published in 1833 and describes the need for increased grain and fruit consumption, lower consumption of meat; and abstinence from alcohol, tobacco and strong drinks (Doctrine and Covenants, 1990:175-176). Adherence to the Word of Wisdom is required for participation in many of the ceremonies and rituals within the church.

Research on Mormon Religiosity and Health

A considerable amount of research has been conducted on the Mormon population describing health benefits stemming from these religious lifestyle practices (Gardner and Lyon, 1982:246; Lyon et al., 1978:361; Lyon et al., 1980:1056). Active, practicing Mormons who get moderate exercise, get eight hours of sleep each day, and never smoke live longer than the general population (Enstrom, 1989:1812). Specifically, men live eleven years longer and women six years longer than the general population (VanDenBerghe, 1994:36). Smoking related cancers are significantly lower among Utah Mormon males (Gardner and Lyon, 1982:252). Utah Mormons also have 22% lower cancer mortality rates than the United States population as a whole (Lyon et al., 1980:1057). Although
the health benefits are well documented, it is not known to what extent religiosity is related to physical fitness. Blakemore (1997:16) found that there was a significant relationship between religiosity and physical fitness in middle-aged female members of the Church. This study is designed to expound on Blakemore's (1997:16) work and examine the relationship between religiosity and physical fitness in Mormon men, aged 24-45.

Definitions

For the purposes of this study the following definitions or terms will be used:

**Health** - characterized by a capacity to enjoy life, an ability to adapt, and the absence of disease (Bouchard et al., 1990:6)

**Physical activity** - any body movement that results in a substantial increase over the resting energy expenditure (Bouchard et al., 1993:11)

**Health-related physical fitness** - the status of an individual with respect to: cardiorespiratory endurance, body fat, and muscular strength (Bouchard et al., 1993:11)

**Religion** - a belief in a higher power or value system which gives meaning to life and leads to the observance of rites, rituals, celebrations, and prayer. These beliefs usually include a moral code of conduct that dictate personal actions (e.g., church attendance, monies donated, and service rendered) (Vanderpool, 1980:8; Cornwall et al., 1986:228; Levin and Vanderpool, 1987:597)
Chapter 1

Introduction

The concept that regular physical activity has a positive impact on physical fitness and overall health has been well established (American College of Sports Medicine [ACSM], 1995; Pate et al., 1995; Shephard, 1995; Surgeon General, 1996). Religious commitment or religiosity has also been shown to have a positive relationship with overall good health (Larson et al., 1989; Mathews, 1995). However, the relationship between religiosity and physical fitness has not been studied extensively. Blakemore (1997) found that there was a significant relationship between religiosity and physical fitness in middle-aged Mormon women. Therefore, this study will examine the relationship between religiosity and physical fitness in middle-aged Mormon men.

Recently the Surgeon General (1996) stated that over 60% of the general population is not regularly active. This high level of inactivity increases health risks and has a negative impact on individual health and fitness (Pate et al., 1995; Foreyt & Goodrick, 1995). Although activity level has been linked to fitness level there are other fitness variables that merit further investigation. One possibility is the connection between high levels of religious commitment and physical fitness, because certain religions have been found to be associated with healthy lifestyle behaviors and health benefits. Mathews' (1995) review of 212 studies on religious commitment
and health concluded that individuals with higher levels of religious commitment experienced less substance abuse, greater physiological health, improved quality of life, and improved medical outcomes; and 75% of the studies showed overall health benefits.

Studying a religious population with a uniformity of religious beliefs makes isolating and studying individual health variables easier. The members of The Church of Jesus Christ of Latter-day Saints (Mormons) are useful for studying health-related issues because of the strict health code practiced by active members.

This study will explore the relationship between level of religiosity and physical fitness. The examination of this relationship within all religions and age groups is beyond the scope of this study. Therefore, this study will examine the correlation between religiosity and physical fitness in male members of the Mormon church aged 25 to 45 years.

Problem Statement

This study will evaluate the relationship between level of religiosity and physical fitness among male members of the Church of Jesus Christ of Latter-day Saints aged 25 to 45 years.

Hypothesis

Null: There will be no significant relationship between level of religiosity and physical fitness in male members of the Church of Jesus Christ of Latter-day Saints aged 25 to 45 years.
Alternative: There will be a significant relationship between level of religiosity and physical fitness in male members of the Church of Jesus Christ of Latter-day Saints aged 25 to 45 years.

Delimitations

The subjects in this study will be residents of the Utah County area. All subjects will meet the following criteria:

1. Subjects will be male.
2. Subjects will be between the ages of 25 to 45 years.
3. All subjects will be members of the Church of Jesus Christ of Latter-day Saints.
4. Subjects will complete a medical screening questionnaire and read and sign an informed consent form.

Basic Assumptions

1. The subjects will give maximal effort during the fitness testing.
2. The subjects will honestly answer the religiosity questionnaire.
3. Subjects will be equally distributed religiously active and inactive male members.

Limitations

1. The sample may not be representative of the international male Mormon population aged 25 to 45 years.
2. The subjects may not answer honestly on the religiosity questionnaire.
Definition of Terms

Health - characterized by a capacity to enjoy life, an ability to adapt, and the absence of disease (Bouchard, Shephard, Stephens, Sutton, & McPherson, 1990)

Physical activity - any body movement that results in a substantial increase over the resting energy expenditure (Bouchard, Shephard, & Stephens, 1993)

Health-related physical fitness - the status of an individual on the health-related physical fitness: cardiorespiratory endurance, body fat and muscular strength

Religion - a belief in a higher power or value system which gives meaning to life and leads to the observance of rites, rituals, celebrations, and prayer. These beliefs usually include a moral code of conduct that dictate personal actions (e.g., church attendance, moneys donated and service rendered)(Cornwall, Albrecht, Cunningham & Pitcher, 1986; Levin & Vanderpool, 1987; Vanderpool, 1980)

Religiosity - The extent to which one puts into practice his or her religious beliefs. Such practice involves commitment (Hoffman, 1992).

Significance of the Study

Those who are more religious tend to have a higher level of health and a decrease in the number of preventable risk factors, suggesting that there is a relationship between religiosity and physical fitness. This study
examines the relationship between high levels of religiosity and physical fitness. If there is indeed a connection between higher levels of religiosity and physical fitness, this could impact the health profession. Doctors, counselors, and psychologists might recommend religion to help patients overcome addictions and to improve general health conditions.
Religiosity & Physical Fitness in LDS Men

Religiosity - the extent to which one puts into practice his or her religious beliefs. Such practice involves commitment (Cornwall et al., 1986:227)

METHODS

Selection and Control of Subjects

A total of 110 Mormon men, aged 24 to 45 years, were selected as subjects. Approximately every fifth person in the Utah County phone book from the Provo/Orem area was contacted as a potential subject. Due to an insufficient number of willing subjects, calling was supplemented by distribution of flyers, personal contacts, and newspaper advertisements. Each respondent was asked their gender, age, and church affiliation. Each subject was informed about the fitness testing procedures (ACSM, 1995:47-48) prior to the test date. All testing took place in the Human Performance Laboratory at Brigham Young University, Provo, Utah, and the Fitness Room at Utah Valley State College, Orem, Utah. At the testing site, each participant completed a medical screening questionnaire and read and signed an informed consent form as required by the Human Subjects Committee at Brigham Young University. Following testing, subjects received $10.00 for their participation.

Instruments and Testing

Participants initially completed a sixty-five question religiosity questionnaire. Forty-nine questions, dealing with belief, belonging, and
Chapter 3

Methods

Problem Statement

This study will evaluate the relationship between level of religiosity and physical fitness among male members of the Church of Jesus Christ of Latter-day Saints aged 25 to 45 years.

Selection and Control of Subjects

A total of 150 men will be selected as subjects by calling every fifth name in the phone book covering the Utah County communities adjoining Brigham Young University (See Appendix A-1). Each respondent will be asked gender, age, and church affiliation. If Mormon, they will be asked their self-reported religious activity level and if they are willing to come to BYU and participate in a research study requiring testing of physical fitness and completion of a religiosity and physical fitness questionnaire. Subjects must meet the following criteria:

1. Male
2. Aged 25 to 45 years
3. A member of the Church of Jesus Christ of Latter-day Saints

Calling will continue until an equal number of religiously active and less-active Mormons has been obtained. Those who qualify will be paid $10.00 to come and be tested on the Brigham Young University campus. Each subject will be instructed to: a) wear clothing that is appropriate for
physical activity, especially comfortable shoes for walking; b) limit any strenuous physical activity within 4 hours of testing; and c) avoid alcohol, caffeine or the use of tobacco products within 3 hours of testing.

After arriving at the testing site, each participant will complete a preliminary medical screening questionnaire (see Appendix A-2) and will then be informed about the testing procedure and asked to read and sign an informed consent form (see Appendix A-3). Each subject will be given a chance to ask any questions associated with the testing procedures.

Instruments and Testing

The testing will start with each subject filling out the 65-question religiosity questionnaire (see Appendix A-4). The questionnaire will measure religiosity utilizing a model developed and tested by Cornwall et al., (1986). The original questions dealing with parenting will not be used. Additional questions (#13, 17, 20, 26-29, 45-49 and 62-65) about the body, exercise patterns and theology were added. Questions 62-65 were taken from Enstrom (1989).

The physical fitness assessment will then proceed in the following order: Perceived Functional Ability questionnaire (George, Stone, & Burkett, 1997); anthropometric measurements of height, weight, hip and waist circumference, and muscular strength; and possibly a submaximal treadmill test. All of the tests were selected because they are nonthreatening and noninvasive.
All testing will take place in the Human Performance Laboratory at Brigham Young University, Provo, Utah. All evaluators will be trained and experienced with fitness testing.

**Anthropometric Measurements**

Height and weight will be obtained by utilizing a Detecto-Medic Scale (Detecto Scales, Inc, Brooklyn, NY). Each subject will be instructed to remove their shoes and stand on the scale. Height will be measured to the nearest half inch and weight will be measured to the nearest pound. The waist and hip measurements will be measured with a nonstretching tape measure to the nearest half inch. Waist measurements will be obtained just above the umbilicus and below the ribs (ACSM, 1995). The hip measurement will be taken at the greatest circumference in the buttocks and hips region (ACSM, 1995).

**Body Mass Index**

Obesity or excessive body fat is a negative health risk (ACSM, 1995). The Body Mass Index (BMI) is moderately correlated to percent fat ($r = 0.80$) (Brooks, Fahey, & White, 1995). This study will utilize BMI for assessing relative body fat. Nonobese is considered <25 for men and <27 for women. Moderately obese is considered between 25-30 for men and 27-30 for women, and obese is >30 for both men and women (George, Fisher, & Vehrs, 1994). The weight and height recorded above will be converted to kilograms and
meters and utilized in the following formula (Keys, Fidanza, Karvonen, Kimura, & Taylor, 1972).

\[
\text{BMI} = \frac{\text{BW}}{(\text{Ht})^2}
\]

Key:

\begin{align*}
\text{BW} &= \text{Body Weight (in kilograms)} \\
\text{Ht} &= \text{Height (in meters)}
\end{align*}

Muscular Strength

Muscular strength is classified as the ability to exert a force (Brooks et al., 1995). A level of strength is needed for day to day activities and general health (Montoye & Lamphiear, 1977; ACSM, 1995). The hand grip dynamometer is a way of testing muscular strength. The following protocol will be followed in this study (George et al., 1994).

1. The participant assumes a standing position with the head erect, facing straight forward.

2. The participant adjusts the grip dynamometer so that the middle finger's second phalanx opposes the gripping device at a 90° angle.

3. The forearm will be set at a 45° angle and rotates slightly outward.

4. The participant squeezes the grip quickly and maximally, taking no more than a few seconds to perform each trial. Initial body position will not change.
5. Three trials will be done with each hand, with a resting period of approximately 45 seconds between trials.

6. The results will be recorded on the information sheet.

**Cardiovascular Endurance**

Cardiovascular endurance is best measured by maximal oxygen consumption or VO$_{2\text{max}}$ (Brooks et al., 1995; ACSM, 1995). Maximal tests are time consuming and costly to perform. Submaximal tests have been created that are cost effective and have a high correlation with maximal VO$_2$ tests. This study utilizes two such tests. The George et al., (1997) Perceived Functional Ability questionnaire (see Appendix A-5) will be answered by all participants ($R = .84$, SEE $= 3.60 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$) and the Ebbelein, Ward, Puleo, Widrick and Rippe (1991) submaximal treadmill walking test ($R=0.96$, SEE $= 4.85 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$) will be administered to those participants with less than two exercise risk factors, no history of heart disease, and no acute physical limitations.

For the treadmill test each subject will first be instructed on the testing protocol and will then be fitted with a Polar Pacer heart rate monitor (Polar CIC, Inc., Port Washington, NY). A Precor C94 treadmill (Precor Inc., Bothell, WA) will be used for the test.

The test will begin with each subject warming up at a comfortable but brisk 2.0 to 4.5 mph pace for 4 minutes at 0% grade. During this time the subject's heart rate should reach a steady state heart rate within 50%-
70% of their age-predicted maximum (220 - age). Steady state is reached when consecutive heart rates (30 seconds apart) differ by 3 beats per minute or less. After their heart rate stabilizes, the grade will be raised to 5%. The subject will continue walking until heart rate reaches another steady state or plateau. When this is achieved the test is finished and the subject will be directed to hold onto the railings and continue walking until the treadmill is lowered and decelerated. The steady state heart rate and the treadmill speed will be recorded and utilized in the following VO$_{2\text{max}}$ regression equation.

\[
\text{VO}_2\text{max} = 15.1 + 21.8 \text{ (SPD)} - 0.327 \text{ (HR)} - 0.263 \text{ (SPD) (AGE)} \\
+ 0.00504 \text{ (HR) (AGE)} +5.98(\text{Gender})
\]

Key:

SPD  = Speed - Miles Per Hour  
HR   = Heart Rate - Beats Per Minute  
AGE  = in years  
Gender= Male - 1, Female - 0

Analysis

All testing results will be recorded on a testing results form (see Appendix A-6). The independent variable is the participant’s current religious commitment as measured by the questionnaire. The dependent variable is the level of physical fitness at the time of testing. Numerical responses on the religiosity questionnaire will be tabulated and statistically
separated into religious activity levels by a between-groups ANOVA. A regression will also be run to see what physical fitness variance can be accounted for by religiosity.
spiritual commitment, were used from a model developed and tested by Cornwall et al. (1986:228-233). The original questions dealing with parenting were not used. Two additional questions about the body (#13,17) and fourteen about exercise patterns were added (# 20, 26-29, 45-49 and 62-65). Questions 62-65 were taken from Enstrom (1989:1808). To explore the relationship between religiosity and physical activity level a physical activity rating questionnaire was also filled out (George et al., 1997:418).

Maximal oxygen uptake, or VO$_{2\text{max}}$, was estimated using a submaximal treadmill walking test (Ebbeling et al., 1991:968). Anthropometric measurements of height, weight, hips (widest point), and waist circumference (at the umbilicus) were measured. Body composition was estimated by Body Mass Index (BMI) and was calculated from height and weight measurements (Keys et al., 1972:339). Muscular strength was measured with a hand grip dynamometer (Montoye and Lamphiear, 1977:111). The second of two trials with each hand was recorded. All subjects completed the testing in the same order and were tested by experienced exercise test technicians. All tests were selected because of their reliability, ease of administration, and because they were nonthreatening and noninvasive.

ANALYSIS

Likert scale responses for the five questions that specifically assessed church attendance, monies paid, and church service on the religiosity
questionnaire were summed to create a total religiosity score. These questions are as follows:

Question #10 = I like going to church on Sunday.
(Range 1-6: Not at all - Somewhat - Exactly)

Question #30 = How often do you attend sacrament meeting.
(Range 1-6: Never - Once a Month - Usually)

Question #45 = I pay a full tithing.
(Range 1-6: No, never - Yes, a little - Yes, a lot)

Question #48 = I pay fast offerings.
(Range 1-6: No, never - Yes, a little - Yes, a lot)

Question #49 = I hold a church calling.
(Range 1-6: No, never - Yes, a little - Yes, a lot)

These questions were selected using canonical techniques as the only significant questions measuring the level of religiosity in the study of Mormon women (Blakemore, 1997:16). A point total was determined by adding the numerical responses to each question. This sum provided a numerical representation of each subject's level of religiosity. Subjects were separated into groups based on this total (range 0-29). Division cut points were set to optimally distinguish religiosity level. From the total subjects (N=110), those with scores below 18 (N=14) were considered less religious, and those with scores of 29 (N=35) were considered highly religious. Those with scores between 18 and 29 (N=61) were considered moderately religious.
and were not used in the physical fitness analysis. A one-way ANOVA (between-groups design) was used to determine the difference in fitness between the less religious and highly religious groups.

RESULTS

In this sample of Mormon men, aged 24 to 45 years, there was no statistical difference between any of the physical fitness variables between groups. There was however, a significant difference ($P<0.0388$) between physical activity levels when the high and moderate religious groups were combined. Significance was set at $p<0.05$ and the results are listed in Table 1.

(Table 1 about here)

DISCUSSION

One of the unique characteristics of this study is that its findings are contrary to a similar study done by Blakemore (1997:16) with Mormon women. In Blakemore (1997:16) a significant difference was found between highly religious Mormon women and less religious Mormon women on the physical fitness variables of body composition, waist circumference, and waist-to-hip ratio.

Factors that may have influenced the outcome could be the sensitivity of the tests and the sample population characteristics. The physical fitness tests were originally chosen because of their noninvasive protocols and ease of administration to large numbers of participants. The sensitivity of these
Religiosity & Physical Fitness in LDS Men

tests may not have been sufficient to detect differences that may exist within the population. A series of more accurate or precise tests, such as a blood profile, hydrostatic weighing or a maximal exertion treadmill test to measure VO$_{2\text{max}}$, may have found significant differences in the fitness variables. This study did find that the grip measurements were average and the VO$_{2\text{max}}$ measurements were above average, compared to the general population. It is interesting that grip tests for both groups were moving toward significance (p>.1214 and .1561). The entire sample population BMI mean was borderline nonobese to moderately obese. This shows that the population, as a whole, is relatively homogenous and healthy regardless of religiosity level.

Utah County is currently one of the most religiously active areas within the Mormon church worldwide. This made it difficult to find less religious subjects and limited the sample size. A larger sample size may have found significant differences. Historically, the state of Utah has one of the nation's lowest percentages of smokers and a lower recorded level of smoking-related illnesses (Gardner and Lyon, 1982:243). A study done by Lyon et al. (1978:364) illustrated that Utah non-Mormons had a significantly lower incidence of lung cancer than the national average, but still higher than Utah Mormons. This suggests that less religious Mormons in this study may be affected by the strong Mormon influence regarding abstinence from harmful substances. Only 10% of the sample population
smoked. A higher percentage of smokers among the subjects would likely have influenced the fitness results.

Among a national sample of high school seniors, Mormons were the least likely to use marijuana and had a significantly lower consumption rate of other harmful substances (Amoateng and Bahr, 1986:71). There was a large difference in alcohol and marijuana use between religious and less religious Mormon youth. Less religious Mormons consumed both substances at the same rate as the sample population. The religious Mormons had a significantly lower consumption rate (Amoateng and Bahr, 1986:64). It would be interesting to assess fitness and religiosity among high school or young adult age groups.

It is true that there is a decrease in health-destructive behaviors and an increase in general health with higher levels of education (Hay, 1988:1322). The education level of the entire sample population was relatively high; 55.9% had at least four years of post-high school education, 15.6% had three years and 17.4% had at least two. There was no apparent difference in education level between groups. The education level in the current sample may have influenced the outcome.

Mormons as a whole are encouraged to be actively involved in their families and in the community. This involvement, and the associated responsibilities and time commitments, may limit the possibilities for physical activity. These meetings and planned activities can influence male
members in a variety of ways. The young men of the Church may participate in Church programs involving physical activity. Over time they may lose interest in the church doctrine and still maintain a high level of physical activity. Conversely, adult members that remain religiously active may be called upon to serve in administrative Church positions and be required to attend many sedentary meetings potentially decreasing their physical activity level. These possibilities may help to explain the homogeneous level of physical fitness found between religiously active and inactive groups.

After completing the analysis and finding no significant differences between highly religious and less religious groups based on physical fitness levels, the differences between physical activity levels were examined. There was initially no significant difference between physical activity level. However, there was a significant difference when the moderate and highly religious groups were combined. Physical activity was assessed on a ten point scale with zero being avoiding exertion and a ten being vigorous activity. The less religious group was 3.36 or at the lower end of moderately physically active. The combined high and moderate religious group were 4.72 or at the higher end of the vigorous activity. This result suggests a possible relationship between higher levels of physical activity and higher levels of religiosity, with the moderately religious actually having the highest physical activity levels. This also suggests that the
Religiosity & Physical Fitness in LDS Men

moderately religious participants value physical activity more than religiosity. Blair (1989:2401) found that there is an overall decrease in mortality rate with an increase in physical activity. This complements the work done by Enstrom (1989:1812), who found that on health-related mortality rates also decrease with an increase in Mormon religiosity. Both studies illustrate a decrease in mortality rates, and this may also support a possible tie between religiosity and physical activity. Further study is needed to truly relate physical activity with religiosity.

An interesting observation of the five religiosity questions shows that all five questions are action based. The action and overall commitment needed to actually attend church services, give monies, and fulfill church callings may be the same commitment needed to obtain and maintain physical fitness. This may be why these questions were found to be significant for Mormon women (Blakemore 1997:16). We know research has shown that women are more religious than men (Mull et al., 1987:156). Some reasons for this could be that women may utilize the religious benefits of a social network, a place to belong, and a place to find personal meaning. In this setting women can find the social support needed to maintain physical activity and ultimately physical fitness. They may work out with other church members and may participate in fitness classes taught by the church. Men often have found their social outlet or support through the
work place and other clubs or organizations. This may be a factor in why religion may not fulfill this role in this study.

CONCLUSION

A substantial amount of research supports the association between high religiosity and increased health benefits. Physical activity is also associated with increased health benefits. Evidence suggests that Mormons enjoy health benefits due to their theology practices. Within this sample population there is not a significant correlation between religiosity and physical fitness for male members of the Mormon church between 24-45 years of age. To better understand the relationship between physical fitness and religious commitment, more research is needed. Within the Mormon church, it would be of interest to assess Mormons outside Utah County and also outside the state of Utah. This would help remove the strong Mormon influence on Mormons who are less religious. Also, a location with no predominate religion would illustrate the relationship between religion (not just one religion) and physical fitness. Studying other specific religious denominations to determine if a relationship exists between physical fitness and religiosity would also be beneficial in understanding how religiosity can influence physical fitness and overall health. Longitudinal studies evaluating changes in fitness levels compared to changes in religious commitment levels over time would help clarify the strength of the relationship between fitness and religiosity. It would also be interesting to
examine the possible relationship between religiosity and the variables of physical activity, nutritional practices, obesity, and smoking. This list is by no means all inclusive. This study found that physical activity is one factor that may help explain a possible link between religiosity and physical fitness. All of the other factors merit investigation.

Fitness and religiosity appear to be related among Mormon women but, based on our findings, not Mormon men. Therefore, an increase in religiosity may be associated with improved physical fitness for Mormon women. However, no such association can be made for Mormon men. It is recommended that further research be done to substantiate the results found in these two studies.
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<table>
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<th>Fitness Variables</th>
<th>Less-religious (N=14)</th>
<th>Highly-religious (N=35)</th>
<th>P-Values</th>
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<tbody>
<tr>
<td>BMI</td>
<td>25.6 ± 5.39</td>
<td>26.4 ± 4.00</td>
<td>.5425</td>
</tr>
<tr>
<td>Waist/Hip Ratio</td>
<td>.868 ± .067</td>
<td>.867 ± .068</td>
<td>.9670</td>
</tr>
<tr>
<td>Right Grip</td>
<td>45.9 ± 9.82</td>
<td>50.5 ± 9.27</td>
<td>.1214</td>
</tr>
<tr>
<td>Left Grip</td>
<td>46.3 ± 10.8</td>
<td>49.9 ± 9.01</td>
<td>.1561</td>
</tr>
<tr>
<td>VO₂</td>
<td>52.6 ± 9.01</td>
<td>51.1 ± 8.88</td>
<td>.6076</td>
</tr>
</tbody>
</table>

(No statistically significant differences between groups)
References


Appendix A

Prospectus
Chapter 2

Review of Literature

Physical Activity and Health

A substantial amount of research has illustrated a relationship between physical activity and health (Blair, 1995; Pate, 1995; Shephard, 1995). Historically, there has been an emphasis on reaching and maintaining high physical fitness levels. Vigorous exercise for at least 20 minutes 3 times a week was recommended (Pate, 1995). Recently there was a progressive shift away from an emphasis on continuous, vigorous exercise to one that is more focused on health benefits. The American College of Sports Medicine and the Centers for Disease Control recommended that 30 minutes of accumulated, moderate-intensity physical activity is needed per day to receive health benefits (Pate 1995; Pate et al., 1995). Shephard (1995) summarized the work of over 100 experts substantiating the positive effects of physical activity on certain health conditions. With all of the evidence substantiating the relationship between physical activity and better health, it is hard to understand why over 60% of the adult population (Surgeon General, 1996) choose to be physically inactive.

Statistics show that physical activity decreases with age, primarily in the adolescent and young adult years (Surgeon General, 1996), and women are generally less physically active than men (Pate et al., 1995). This age and gender related decrease in activity will ultimately be followed by a
decrease in physical fitness during later life. However, religiosity has been found to exert a strong positive effect on the health of the elderly (Courtenay, Poon, Martin, Clayton, & Johnson, 1992; Idler, 1987; Idler, 1994; Idler & Kasl, 1992; Mull, Cox & Sullivan, 1987). This suggests a possible relationship between religiosity and physical fitness that will counteract the decline of health with age. The connection between religiosity and physical activity and well-being merits exploration.

Religiosity and Health

A religious organization can influence health practices in at least two ways: a) provide an environment of social support (Gottlieb & Green, 1984), and b) discourage health destructive behaviors (Bahr, 1994).

Social Support

There is a positive relationship between high levels of religiosity and physical health (Idler, 1994; Idler & Kasl, 1992; Levin, 1988; Mathews, 1995; Ransom, Fisher & Terry, 1992). Religiosity also enhances emotional well-being and life satisfaction (Ellison, 1991; Hadaway & Roof, 1978; Hall, 1992; Koenig, George, & Siegler, 1988; Jensen, Jensen, & Wiederhold, 1993; Levin, Chatters, & Taylor, 1995; Wright, Frost, & Wisecarver, 1993). Those who attend church at least once a month are healthier (Comstock & Partridge, 1972; Hannay, 1980) and those who pray and are active participants in their religions have better health (Ferraro & Albrecht-Jenson, 1991). Religiosity has also been correlated to an increased recovery

Health Destructive Behaviors

This includes any behavior that negatively affects health, including harmful substances. Religiosity seems to be inversely related with health destructive behaviors (Amoateng & Bahr, 1986; Brizer, 1993; Brown & Gary, 1994; Cochran, 1992; Koenig, George, Meador, Blazer, & Ford, 1994; Oleckno & Blacconiere, 1991; Perkins, 1985; Robles, 1987), although the relationship is the strongest within religions that teach abstinence from harmful substances (Bahr, 1994).

Religiosity and Physical Fitness

Physical activity itself was linked to religious worship in the Greek culture. The Olympics were originally organized as religious festivals meant to bring communities together while worshiping the Gods (Esterling & Muir, 1987). History also shows that exercise was used as a form of preventive medicine in the Greek culture (Park, 1995).

The Christian belief system involves an innate respect for the human body. Pope John Paul II, in 1979, discussed how sports promote "educating, developing, and strengthening the human body" (Kerrigan, 1992, 253). He continued by saying that taking care of the physical body is a personal responsibility. Most organized religions do include some kind of
health code, whether it be a recommendation or a "theologically based" commandment.

The clergy have been found to have a longer life expectancy and lower mortality rates (King & Bailar, 1969; King & Locke, 1980). Colligon (1985) showed a significant relationship between religiosity and physical activity. Blakemore (1997) found a significant correlation between religiosity and physical fitness in middle-aged Mormon women.

Health and the Mormon (Latter-day Saints) Church

The uniformity of health practices within the Mormon church makes its members an ideal population for examining the relationship between physical fitness and a specific religion's theology. This is especially true when comparing religiously active and less-active individuals.

Mormons have a strict health code called the Word of Wisdom. The Word of Wisdom was originally published in 1833 and describes the need for increased grain and fruit consumption, lower consumption of some meats and abstinence from alcohol, tobacco and strong drinks (Doctrine & Covenants, 1990, pp. 175-176). To encourage adherence to the Word of Wisdom, observance is required for participation in many of the rites and rituals within the church. A considerable amount of research has been conducted on the Mormon population explaining health benefits stemming from religious practices (Enstrom, 1989; Gardner & Lyon, 1982; Lyon,

The Word of Wisdom may be partially responsible for the finding that active, practicing Mormon men live 11 years longer and Mormon women live 6 years longer than the general population (VanDenBerghe, 1994). Smoking related cancers were significantly lower in the Utah Mormon male population (Gardner & Lyon, 1982; Lyon et al., 1980) and Utah Mormons have 22% to 35% lower cancer mortality rates than the United States population as a whole (Lyon et al., 1980; Lyon et al., 1978). Among a national sample of high school seniors, Mormons were the least likely of any religion to use marijuana and had a significantly lower consumption rate of other harmful substances (Amoateng & Bahr, 1986).

Conclusion

A substantial amount of research supports the association between high religiosity and increased health benefits. Physical activity has also been correlated to increased health benefits. Evidence suggests that Mormons enjoy various health benefits due to theology practices. A relationship between religiosity and physical fitness has been established in middle-aged Mormon women (Blakemore, 1997). This study is designed to extend that earlier work and examine religiosity and physical fitness in religiously active and less-active Mormon men aged 25 to 45 years.
Appendix A-1

Telephone Dialogue
Telephone Dialogue

Hello, my name is ______________ (Janette Olsen) and I am a graduate student at Brigham Young University. I am currently conducting a research study for my masters degree. I am examining the relationship between levels of religious commitment and physical fitness in LDS men. Do any LDS men between the ages of 25 and 45 live here? If interested they (you) will be paid $10.00 to come to BYU for testing. All testing will take about one hour and fifteen minutes.

They (You) will be asked to complete a questionnaire on religious commitment and physical activity taking no more than 30 minutes and participate in a physical fitness assessment that will take no more than 45 minutes. The assessment will include body measurements (height, weight, waist, hip), a hand grip strength test and possibly a 6 - 7 minute treadmill walking test. The total testing will take no more than one hour and fifteen minutes.

May I ask you 2 questions to verify that you fit within the subject criteria? Let me assure you that all information will be held confidential.

How religiously active would you say you are? (active or inactive?)
How often have you attended Sacrament Meeting in the last two months?

Can you come in on________? What time is convenient for you_______?

On the day of testing please:

1. Wear light weight clothing that is appropriate for physical activity and comfortable walking shoes.
2. Limit strenuous physical activity for four hours before testing.
3. Avoid alcohol, caffeine or the use of tobacco products within 3 hrs of testing.

Do you have any questions?
May we call you to remind you of your appointment?
Appendix A-2

Preliminary Medical Screening Questionnaire
Preliminary Medical Screening Questionnaire

Circle the most appropriate answer

1. Has a physician every told you that you have a heart condition and advised you to only perform physical activity under a physician's direction?
   Yes / No

2. Do you ever experience chest pain during physical activity?
   Yes / No

3. Have you experienced any chest pain unrelated to physical activity within the last month?
   Yes / No

4. Do you ever feel dizzy to the point of loosing your balance or consciousness.
   Yes / No

5. Do you have any problems with your joints or bones that would be aggravated by physical activity?
   Yes / No

6. Are you currently or have you ever taken medication for a heart condition or blood pressure?
   Yes / No

7. Is there any other reason why you should not exercise without medical supervision?
   Yes / No

8. Do you have a common cold or any other temporary illness that causes you to currently not feel well?
   Yes / No

Note: If any of the above are answered with a yes the physical assessment will be postponed.
Appendix A-3

Informed Consent To be a Research Subject
Informed Consent To be a Research Subject

Explanation of the Test

The purpose of this study is to determine if there is a relationship between religious commitment and physical fitness. This research is being conducted by Janette Olsen, a graduate student in Physical Education at Brigham Young University.

Participation includes one day of testing that will last approximately one hour and fifteen minutes and will take place in the Human Performance Research Center (HPRC) in the Richards Building (Rm 123) on the BYU campus. You will be asked to fill out a 64 question religious commitment questionnaire, a physical activity questionnaire and complete a physical fitness assessment including anthropometric measures, muscular strength and possibly a submaximal treadmill test.

* Anthropometric measures include height, weight and waist and hip circumferences.

* Muscular strength will include gripping a hand dynamometer maximally 3 times with each hand, with 45 seconds between each trial.

* The submaximal walking test will require you to walk at 50-70% of your age- predicted maximal heart rate, a brisk but comfortable pace, for approximately 4 minutes. Then the treadmill grade will be raised to 5% and walking will continue until your heart rate reaches a steady state. (This test will only be completed by those with less than two physical activity risk factors and those with no history of heart disease)

Attendant Risks and Discomforts

If the preliminary medical screening questionnaire is answered correctly the health risks associated with this study are minimal. Yet, you could experience an abnormal blood pressure, fainting, irregular heart beats and in extremely rare instances, musculoskeletal injury or heart attack. There is a slight possibility you will experience muscle soreness 24-48 hours after testing. Trained personnel will be in attendance during all testing to take care of any unusual situation that may arise.

The results of this research study may be published but all personal information obtained through testing will be treated as privileged and confidential. For the purpose of statistical analysis, your name will be given a numbered code and any test data and/or results will not be associated with your name.

please initial when you are finished reading this page
Responsibilities of the Participant

Answer all questions about your religious status and physical activity honestly and objectively to the best of your knowledge. All information about your current health status and any past or current unusual feelings of discomfort during exercise or testing should be promptly disclosed to the testing staff.

Benefits to be Expected

The testing will allow you to know your current physical fitness on anthropometric measures, muscular strength and a treadmill walking test.

Stipend

You will be paid $10.00 for your participation in this study.

Inquiries

There will be trained personnel during all phases of testing to answer any questions that you have. If you have any further questions about this study you may contact Janette Olsen (home phone: 225-2456, work phone 378-2697).

If you have any questions regarding your rights as a participant in this research study, you may contact Dr. Larry Wood, Chair of the Institutional Review Board, 1122 SWKT, Brigham Young University, Provo, Utah, 84602; phone 378-3405.

Freedom of Consent

Your permission to perform this exercise test is voluntary. You are free to stop the test at any point if you desire.

I have read this form, and I understand the test procedures that I will perform and the attendant benefits and risks. Knowing these risks and discomforts, and having had an opportunity to ask questions that have been answered to my satisfaction, I consent to participate in these tests.

____________________________  ____________
Signature of Participant        Date

____________________________  ____________
Signature of Witness           Date
Appendix A-4

Religiosity Questionnaire
<table>
<thead>
<tr>
<th>Subject #</th>
<th>Date</th>
<th>Describes me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I believe Jesus Christ is the son of God.</td>
<td>Not at all</td>
</tr>
<tr>
<td>2.</td>
<td>I have found the people in my ward ready and willing to make friends with me.</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>The main reason I go to church on Sunday is to learn more about my religion.</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>My relationship with God is important to me.</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>I have felt left out of some ward or branch social activities.</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>I believe the Book of Mormon is the word of God.</td>
<td>1</td>
</tr>
<tr>
<td>7.</td>
<td>I think the adults in our ward really care about the youth.</td>
<td>1</td>
</tr>
<tr>
<td>8.</td>
<td>I have been guided or inspired by the spirit of God with some of my problems and decisions.</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>I feel church leaders and members really understand me.</td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>I like going to church on Sunday.</td>
<td>1</td>
</tr>
<tr>
<td>11.</td>
<td>I feel worthy to enter God's presence.</td>
<td>1</td>
</tr>
<tr>
<td>12.</td>
<td>The main reason I go to church on Sunday is to be with friends.</td>
<td>1</td>
</tr>
<tr>
<td>13.</td>
<td>I feel the body is sacred.</td>
<td>1</td>
</tr>
<tr>
<td>14.</td>
<td>I know what it feels like to repent and be forgiven.</td>
<td>1</td>
</tr>
<tr>
<td>15.</td>
<td>I believe I can be religious without attending church, i.e., while hiking in the mountains.</td>
<td>1</td>
</tr>
<tr>
<td>16.</td>
<td>I know that God exists.</td>
<td>1</td>
</tr>
<tr>
<td>17.</td>
<td>I believe the body and the spirit together make up the soul.</td>
<td>1</td>
</tr>
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</table>
Describes me:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Not, very much</th>
<th>Somewhat</th>
<th>Very much</th>
<th>Exactly</th>
</tr>
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<tbody>
<tr>
<td>18.</td>
<td>I believe God approves of the way I live my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.</td>
<td>The main reason I go to church on Sunday is so my children will go. (leave blank if you have no children)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20.</td>
<td>I believe I should exercise and keep my body fit.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21.</td>
<td>I have felt the Spirit of God in sacrament meeting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22.</td>
<td>Sometimes I think the LDS religion is too strict.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23.</td>
<td>I have a lot in common with other Latter-day Saints.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24.</td>
<td>The Holy Ghost is an important influence in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25.</td>
<td>I think church meetings are boring.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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I adhere to the doctrine of the word of wisdom:

<table>
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<tr>
<th></th>
<th>No alcohol</th>
<th>No tobacco</th>
<th>No tea/coffee</th>
<th>No drugs</th>
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<tr>
<td>26.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

30. How often do you attend sacrament meeting? (Circle one number.)

1. Never
2. Few times a year (on special occasions)
3. About every other month
4. About once a month
5. Two or three times a month
6. Usually every Sunday
31. Overall how important is organized religion in your life? (Circle one number.)

1. It is the most important thing in my life.
2. It is one of the most important things in my life.
3. It is somewhat important in my life.
4. It is not very important in my life.
5. It is the least important thing in my life.

Have you ever had any of the following religious experiences?

<table>
<thead>
<tr>
<th></th>
<th>Yes, I'm sure I have</th>
<th>Yes, I think I have</th>
<th>No, but I would like to have</th>
<th>No, I never have</th>
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</thead>
<tbody>
<tr>
<td>32. Felt the Spirit of God</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33. Received a personal witness that the LDS Church is true</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34. Felt God's forgiveness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35. Received an answer to your prayers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36. Made a commitment to follow Christ</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37. Felt God's love</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

38. How happy are you about the kind of person you are? (Circle one number)

1. Not at all happy
2. Not very happy
3. Somewhat happy
4. Pretty happy
5. Very happy

Do you ever feel like the following?

<table>
<thead>
<tr>
<th></th>
<th>No, never</th>
<th>Yes, a little</th>
<th>Yes, a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>39. I am no good</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>40. There is a lot wrong with me</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41. I get a lot of fun out of life</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>42. I am not much good at anything</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>43. Mostly I think I am quite a happy person</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>44. I think I am no good at all</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
I participate in the following LDS Church related activities:

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Pay a full tithing</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>46</td>
<td>Read the scriptures daily</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>47</td>
<td>Pray daily</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>48</td>
<td>Pay fast offerings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>49</td>
<td>Hold a church calling</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Are you: (Circle one number)
1. Female
2. Male

(If female) What is your husband's Priesthood? (Answer only if married)
1. Unordained
2. Deacon
3. Teacher
4. Priest
5. Elder
6. High Priest
7. Don't know
8. Not married or spouse not LDS

(If male) What is your Priesthood
1. Unordained
2. Deacon
3. Teacher
4. Priest
5. Elder
6. High Priest
7. Don't know
8. Not LDS

Do you work for pay?
1. Yes--If yes answer questions 54 and 55.
2. No--If no are you:

1. a full-time homemaker
2. not employed, not looking for work
3. not employed, looking for work
4. retired
5. disabled

What kind of work do you do?

How many hours per week do you usually work (at all jobs)?

_____ hours per week
56. What is your current marital status?
   1  Married (first time)
   2  Remarried after divorce
   3  Remarried after death of spouse
   4  Widowed
   5  Never married
   6  Divorced or separated

57. Does your spouse belong to the LDS Church? (Answer only if currently married)
   1  yes  2  no

58. What type of ceremony did you have for your most recent marriage?
   1  Civil
   2  Church
   3  Civil or church followed by temple ceremony
   4  Temple ceremony
   5  Does not apply

59. What is your age? ____

60. What is your race:

61. Circle the highest grade in school you have completed:

   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 14 18 19 20+
   Elementary  High School  College/Technical  Graduate School

   School

62. How many hours of sleep do you usually get per night?
   a. 4 or less
   b. 5-6
   c. 7-8
   d. 9 or more

63. How would you rate your participation in inactive sports?
   a. often  b. sometimes

64. How would you rate your participation in physical exercise?
   a. often  b. sometimes

65. How would you rate your current health status?
   a. good  b. fair  c. poor
Appendix A-5

Perceived Functional Ability Questionnaire
Perceived Functional Ability Questionnaire

Suppose you were going to exercise continuously on an indoor track for 1 mile. Which exercise pace is just right for you—not too easy and not too hard?

Circle the appropriate number (any number, 1 to 13).

1. Walking at a slow pace (18 minutes per mile or more)
2. Walking at a medium pace (16 minutes per mile)
3. Walking at a fast pace (14 minutes per mile)
4. Jogging at a slow pace (12 minutes per mile)
5. Jogging at a medium pace (10 minutes per mile)
6. Jogging at a fast pace (8 minutes per mile)
7. Running at a fast pace (7 minutes per mile or less)

Note: If you are unfamiliar with pace times in minutes per mile, then use the other descriptive information to answer the question.

How fast could you cover a distance of 3-miles and NOT become breathless or overly fatigued? Be realistic.

Circle the appropriate number (any number, 1 to 13)

1. I could walk the entire distance at a slow pace (18 min. per mile or more)
2. I could walk the entire distance at a medium pace (16 minutes per mile)
3. I could walk the entire distance at a fast pace (14 minutes per mile)
4. I could jog the entire distance at a slow pace (12 minutes per mile)
5. I could jog the entire distance at a medium pace (10 minutes per mile)
6. I could jog the entire distance at a fast pace (8 minutes per mile)
7. I could run the entire distance at a fast pace (7 minutes per mile or less)

Note: If you are unfamiliar with pace times in minutes per mile, then use the other descriptive information to answer the question.
Select the number that best describes your overall level of physical activity for the previous 6 MONTHS:

0 = Avoid walking or exertion; e.g., always use elevator, drive when possible instead of walking

1 = **light activity**: walk for pleasure, routinely use stairs, occasionally exercise sufficiently to cause heavy breathing or perspiration

2 = **moderate activity**: 10 to 60 minutes per week of moderate activity; such as golf, horseback riding, calisthenics, table tennis, bowling, weight lifting, yard work, cleaning house, walking for exercise

3 = **moderate activity**: over 1 hour per week of moderate activity as described above

4 = **vigorous activity**: run less than 1 mile per week or spend less than 30 minutes per week in comparable activity such as running or jogging, lap swimming, cycling, rowing, aerobics, skipping rope, running in place, or engaging in vigorous aerobic-type activity such as soccer, basketball, tennis, racquetball, or handball

5 = **vigorous activity**: run 1 mile to less than 5 miles per week or spend 30 minutes to less than 60 minutes per week in comparable physical activity as described above

6 = **vigorous activity**: run 5 miles to less than 10 miles per week or spend 1 hour to less than 3 hours per week in comparable physical activity as described above

7 = **vigorous activity**: run 10 miles to less than 15 miles per week or spend 3 hours to less than 6 hours per week in comparable physical activity as described above

8 = **vigorous activity**: run 15 miles to less than 20 miles per week or spend 6 hours to less than 7 hours per week in comparable physical activity as described above

9 = **vigorous activity**: run 20 to 25 miles per week or spend 7 to 8 hours per week in comparable physical activity as described above

10 = **vigorous activity**: run over 25 miles per week or spend over 8 hours per week in comparable physical activity as described above
Appendix A-6

Fitness Assessment Recording Form
### FITNESS ASSESSMENT

<table>
<thead>
<tr>
<th>Subject #</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>lbs (1)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Height</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>in (.5)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waist Circumference</th>
<th>Treadmill Walking Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>in (.5)</td>
<td>target 50-70% Max HR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hip Circumference</th>
<th>Hand Grip: Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>in (.5)</td>
<td>#1 R L #2 R L #3 R L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hand Grip: Trial</th>
<th>Speed</th>
<th>HR</th>
<th>VO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 R L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2 R L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3 R L</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix A-7

Payment Verification Form
Name__________________________________________

SS#__________________________________________

I received $10.00 for participating in a research study conducted by the Physical Education Department on _________________.

Date

__________________________________________
Signature

Name__________________________________________

SS#__________________________________________

I received $10.00 for participating in a research study conducted by the Physical Education Department on _________________.

Date

__________________________________________
Signature
Appendix B

Raw Data