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Effects of Levels of Physical Activity on Physical Self-Concept and Social Physique Anxiety Among College Students

Heesu Lee

EFFECTS OF LEVELS OF PHYSICAL ACTIVITY ON PHYSICAL SELF-CONCEPT AND SOCIAL PHYSIQUE ANXIETY AMONG COLLEGE STUDENTS

A Thesis

Presented to the

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In Partial Fulfillment

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by

Heesu Lee

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Approved by:

[redacted]

Dr. Hosung So, First Reader

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Date

[redacted]

Dr. Hyun-Kyoung Oh, Second Reader

ABSTRACT

Physical activity plays a crucial role in contributing to psychological stability regarding physical concept. However, the evidence for showing the association between levels of physical activity and the psychological state has not been closed to focus on college students. This study was to examine the importance of physical activity by investigating the effects of different levels of physical activity on physical self-concept and social physique anxiety among college students. This study used a secondary data set approved by Institutional Review Board, and obtained a written permission and approval for data use. The data set used for this study was not previously analyzed and published. A total of 238 participants (99 males and 139 females) were 4-year comprehensive university students in Southern California. Godin Leisure-Time Exercise Scale (GLTES), Physical Self-Description Questionnaire (PSDQ), and Social Physique Anxiety Scale-7(SPA-7) were used to analyze levels of physical activity, physical self-concept, and social physique anxiety, respectively. The SPSS version 19 was used to analyze the data for the purpose of this study. Results showed that there were statistically significant differences in

physical self-concept and social physique anxiety among the levels of physical activity. There were statistically negative correlations between social physique anxiety and physical self-concept.

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CHAPTER ONE

INTRODUCTION

Background

Awareness of the role of physical activity has risen dramatically in improving health and averting disease over the last couple of decades. Researchers in their studies have been emphasizing the importance of physical activity as a factor related to preventing cardiovascular disease and osteoporosis, developing physical function (strength, endurance, flexibility), and decreasing risk of all-cause mortality (Lollgen, Bockenhoff, & Knapp, 2009; Jensen et al., 2008).

In addition, evidence for the role of physical activity in psychological well-being also has been accumulating with research emphasizing the significance of physical activity in terms of improving or solving a problem related to affectivity such as depression and anxiety (Hall, Ekkekakis, & Petruzzello, 2002). Likewise, physical activity which has positive effects on physical and mental health is one of the indispensible factors, which enhance people's quality of life (Stewart & King, 1991).

According to recent studies (Jung, Bray & Martin, 2009; Huang et al., 2003), however, college students are not likely to actively take part in physical activity to maintain and develop their health. Specifically, college students who participate regularly in physical activity are about 35 percent, which especially the proportion of women is lower than men (Pinto, Cherico, Syzmanski, & Marcus, 1998). Those who are between 18 and 19 years old are on the rapist decline in the level of the physical activity, and the decline keep continuing until 29 years old (Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). Decreased physical activity is likely to make it difficult to lead people to positive effects physically and mentally. In terms of the physical aspect, on one hand, participating in regular physical activity has been identified as an indispensible strategy to prevent obesity (Ogden et al., 2006). In terms of the mental aspect, on the other hand, development of self-esteem has been a major concern among physical activity researchers, linking the development of self-esteem to different facets, such as physical self-concept (Fox, 2000). As indicated by Fox (1998), body image occupies a unique position in the physical self-concept because one's physical interaction with the world provides

important information to the individual about the world. Physical self-concept has been considered as closely link to physical activity, motor competence and performance (Crocker, Eklund, & Kowalski, 2000; Raudsepp, Liblik, & Hannus, 2002; Southall, Okeley, & Steele, 2004). Especially, it is significant for university students to maintain a high level of physical activity during university years in terms of generating positive effects on their lifestyles after graduation (Sparling & Snow, 2002).

Additionally, one of the factors considered as an important variable for self-concept is social physique anxiety (SPA). The SPA is related to feelings of distress, apprehension, or foreboding about others tentatively evaluating one's physical appearance especially, body shape in a negative manner (Hart, Leary, & Rejesk, 1989). SPA should be particularly concerned with respect to physical health outcomes since individuals who have a greater level of SPA are likely to avoid physical activity settings (e.g., sports, exercise) where their body could be showed on display or where their physical attributes are considered as an important factor (Carron & Prapavessis, 1997; Hart et al., 1989). In addition, SPA has been investigated and shown to be related to psychosocial variables such as

global and physical self-esteem (Kowalski, Croker, & Kowalski, 2001), weight dissatisfaction and body dissatisfaction (Crawford & Eklund, 1994), eating attitudes (Haase & Prapavessis, 1998), and motives to exercise and exercise behavior (Crawford & Eklund, 1994), which are relevant to evaluative concerns.

Statement of the Problem

According to the U.S. Department of Health and Human Services (2002), even though research related to physical activity was studied to stress significance of role of physical activity, the level of physical activity regarding participation has been decreasing among college students. According to Garlow et al. (2008), college students are at risk for developing mental health problems; over 53% of undergraduate students sampled reported moderate to severe depressive symptoms, and 11% had considered suicide in the past four weeks. In addition, one study identifying 52.8 % as recognizing levels of moderate to high anxiety (Rosenthal & Schreiner, 2000). According to Sonstoem and Morgan (1989), it is helpful for students to take part in physical activity in terms of developing self-acceptance and competence. According to Bauman and Owen (1999), the

level of physical activity plays a role in investigating humans' inner states such as depression and anxiety. According to Larson (2000), participating in physical activity and perceiving physical competence oneself is crucial, which helps people develop good leadership, altruism, and independence.

The Purpose of the Study

According to researchers who investigate effects of physical activity on physical self-concept and social physique anxiety, physical activity plays a pivotal role in affecting physical concept, such as physical self-concept and social physique anxiety (Fox, 2000; Sonstoem & Morgan, 1989). However, the studies for showing the association between levels of physical activity and physical self-concept and social physique anxiety have not been closed to focus on college students who gradually have been evading the participation of physical activity. This study was to examine the importance of physical activity by investigating the effects of different levels of physical activity on physical self and social physique anxiety among college students.

Hypotheses

1. There would be statistical differences in physical activity, physical self-concept, and social physique anxiety by demographic factors.
2. There would be significant differences between the levels of physical activity and each factor in physical self-concept.
3. There would be statistical differences between the level of physical activity and social physique anxiety.
4. Physical self-concept would be significantly correlated with social physique anxiety.

Limitations of the Study

This study had the following limitations. The first limitation was participants who were selected from one 4-year comprehensive school located in Southern California, which means that the result of this study might not be generalized to different settings of colleges and universities. Second, the number of participants for this study was 238, however; the total number of each variable for data analysis varied due to the method of data collection and missing data from the self-report questionnaire.

Definition of Terms

The primary terms used in this study were conceptually defined as below statement.

A. The level of physical activity is generally defined as the amount of participation in physical movement which affects energy expenditure (Caspersen, Powell, & Christenson, 1985).

B. Physical self-concept, along with a person's global view of his/her physical self represented in multidimensional models, reflects the person's assessment of his/her competence and appearance in the physical domain (Marsh, 1996; Marsh & Redmayne, 1994).

C. "Self-esteem is another term commonly used when referring to self-perception, which is the evaluate component of the self" (Horn, 2004, p. 102).

D. Self-efficacy is defined as a belief about one's abilities to conduct and display all tasks that are supposed to be completed successfully (Bandura, 1997).

E. Social physique anxiety is defined as a level of anxiety that is perceived under evaluation by others' views about their physique (Hart et al, 1989; Leary, 1992).

CHAPTER TWO

REVIEW OF THE LITERATURE

The Role of Physical Activity

Physical inactivity is the one of factors that the incidence of obesity can be affected by (Pangrazi, 2004), on the other hand, a vigorous level of physical activity plays critical roles in improving health and well-being of people (US Department of Health and Human Services, 2002). According to several researches studied among older people, maintaining physical activity in their life can be positively associated with improved quality of life in their future (Nets, Wu, Becker, & Tenenbaum, 2005; Rejeski & Mihalko, 2001). According to two recent cross-sectional studies, physical activity played crucial roles in enhancing better mental health, physical function, vitality, and general health in samples of Japanese men and women (Kimura, Ogushi, Takahashi, Munakata, & Ishii, 2004; Morimoto et al., 2006).

In the other beneficial respect of physical activity, it has been necessary to do physical activity as a means to enhance various aspects of emotional health and produce psychological benefits (Habour, Behrens, Kim, & Kitchens,

2008). Americans who are physically active tend to have symptoms like depression roughly 30% lower than those who are inactive, and also it has been reported that increased exercise time is highly associated with and leads to a reduction in depression (Physical Activity Guidelines Advisory Committee, 2008). In other words, increased adult fitness and regular participation in physical activity are interrelated to less depressive symptomatology and better emotional health (Galper, Trivedi, & Barlow, 2006).

Additionally, it is beneficial for students to participate in aerobic exercise or anaerobic one in order to prevent them from having feelings of hopelessness, depression, and suicidal behavior (Talliaferro, Rienzo, & Pigg, 2009).

Physical Self-Concept

Psychological construct and physical self mean that people have different perceptions individually in aspects of physical domains, such as strength, endurance, sport ability, and physical appearance (Fox & Corbin, 1989). According to Shavelson, Hubner, & Stanton (1976), the overall concept of self includes the subarea or the physical self. The self within individuals' subjective

representation is organized in a hierarchical fashion and is composed of multiple dimensions. As a result of previous studies, researchers have shown that males' score are consistently higher than females on physical self-concept (Marsh, 1998; Sonstroem, 1998). In research on physical self-concept, several studies focus on investigating the relationship of individuals' physical self-concept with different indicators of physical fitness according to different age and sex (Carraro, Scarpa, & Ventura, 2010; Raudsepp & Liblik, 2002;). One of the reasons why there are differences in physical self-concept between genders is that males who would like to enhance their physical capacity have more opportunities to do physical activity than females (Marsh, 1998; Sonstroem, 1998). Both males and females are likely to have stereotypes related to physical and psychological attributes, which have inevitably influenced the differences in participation (Colley, Berman, & Millingen, 2005).

Social Physique Anxiety

Social Physique Anxiety (SPA) is defined as feelings of distress or apprehension caused by others' views who evaluate one's physical appearance negatively (Hart et al.,

1989). SPA is particularly considered as a physical health outcomes, since those who have greater SPA are not likely to do physical activity (e.g., sports, exercise) that their physical appearance or physical capacity related to skills could be displayed or demonstrated (Carron & Prapavessis, 1997; Hart et al., 1989). Physical changes caused by puberty, increased chances to evaluate peers can contribute to heightening students' sense of social awareness and self-consciousness (Brustad & Partridge, 2002; Harter, 1999). In some adolescents, dissatisfaction with their bodies, as well as self-consciousness, can produce negative feelings of SPA (Hart et al., 1989). Generally, participating regularly in physical activity in facilities, such as gymnasia and fitness centers, is highly connected with competence (Sonstroem, Speliotis, & Fava, 1992), and those who have high social physique anxiety have feelings of incompetence when taking part in physical activity contexts (Frederick & Morrison, 1996; Kowalski et al., 2001).Linking SPA to motivation, Brunet and Sabiston (2009) suggested that those who feel like more anxiety in front of others who evaluate their physique aspects, tend to internalize a sense of pressure to be physically active in order to develop their outward appearance. This internalized

pressure would represent a more controlling form of motivation and explain why those with higher SPA may be less likely to actually engage in physical activities. Following two key studies (Gillison, Standage, & Skevington, 2006; Brunet & Sabiston, 2009) have supported this contention. Firstly, SPA was linked to having increased extrinsic goals for exercise which led to less autonomous motivation (i.e., represented by an index of relative autonomy) and less exercise behavior subsequently (Gillison, Standage, & Skevington, 2006). Similarly, Brunet and Sabiston (2009) found that greater autonomous motivation (i.e., represented by an index of relative autonomy) could be seen as a mediator in the correlation between SPA and young adults' leisure physical activity (17-23 years).

CHAPTER THREE

METHODOLOGY

Participants

Participants for this study were from a comprehensive university in Southern California. The total number of participants was 238 (Male = 99, Female = 139), and the range of age for the entire participants was from 18 to 51 (M = 23.14, SD = 5.295). Participants were then divided and categorized into two groups by majors, such as Kinesiology (n = 114, 47.9%) and Non-Kinesiology (n = 124, 52.1%). Participants were categorized into four groups by ethnicity; White Non-Hispanic (n = 87, 36.6%), Black Non-Hispanic (n = 23, 9.7%), Hispanic (n = 109, 45.8%), and Asian (n = 13, 5.5%). The Body Mass Index (BMI) measured by participants' height and weight was used to categorize three subgroups, such as normal weight ranging from 18.5 to 24.9 (n = 116, 48.7%), overweight ranging from 25 to 29.9 (n = 67, 28.2%), and obese over 30 (n = 44, 18.5%).

Instruments

Instruments used for this study included four sections for (a) demographics (b) GLTES (c) PSDQ (d) SPAS-7, which

had a total of 88 items. Items for demographics included gender, major, years of college, BMI, and ethnicity. In addition, GLTES, PSDQ and SPAS-7 were used to measure different levels of physical activity, physical self-concept, and social physique anxiety, respectively.

Table 1. Questionnaires

	Contents	Total Items	Items number
Demographics	Identification, Gender, Age, Major, Years of college, Height, Weight, Ethnicity	8	1,2, 3,4, 6,7, 8
GETES	Strenuous Exercise, Moderate Exercise, Mild Exercise	3	9,10,11
PSDQ	Strength, Body Fat, Physical Activity, Endurance/Fitness, Sports Competence, Coordination, Health, Appearance, Flexibility, General Physical Self-Concept, Self-Esteem	70	12,13,14,15,16 16,17,18,19,20 21,22,23,24,25 26,27,28,29,30 31,32,33,34,35 36,37,38,39,40 41,42,43,44,45 46,47,48,49,50 51,52,53,54,55 56,57,58,59,60 61,62,63,64,65 66,67,68,69,70 71,72,73,74,75 76,77,78,79,80 81
SPAS-7	State Physique Anxiety	7	82,83,84 85,86,87 88
Total		88	

Godin Leisure-Time Exercise Scale (GLTES)

In order to measure levels of physical activity among college students, the GLTES was used in this study. This questionnaire developed by Godin and Shephard (1997) asked

participants three brief questions about the frequency of participation in types of exercise for more than 15 minutes during their free time. Each of the questions deals with different levels of exercise, such as strenuous, moderate, and mild exercise. Godin and Shephard (1997) conducted test-retest for measuring reliability, and found correlation coefficient for test-retest of .48 (mild), .46 (moderate), and .94 (strenuous exercise). To compute the different levels of physical activity, total weekly leisure activity was calculated in arbitrary units by summing the products of the separate components, as shown in the following formula:

Weekly leisure activity score

= (9 * Strenuous) + (5 * Moderate) * (3 * Light)

Based on the weekly leisure activity score calculated by the formula above, three levels of physical activity were formulated. The three groups were then labeled as low, moderate, and high activity levels. In order to examine the effect of levels of physical activity, the participants were proportionally assigned into the three groups. The low activity group (n = 79) was decided from 0 to 33.3 percentile from the entire participants. The moderate group

(n = 80) was from 33.4 to 66.7 percentile. Last, the high activity level (n = 79) was from 66.8 to 100 percentile (see Table 2).

Physical Self Description Questionnaire (PSDQ)

The Physical Self-Description Questionnaire (PSDQ) was developed to examine the physical self-concept by Marsh, Richards, Johnson, Roche, and Tremayne (1994). The PSDQ (Marsh et al., 1994) is a 70-item scale designed to measure 10 facets of physical self-concept, along with general self-esteem using five-point Likert-type scales ranging from 1 to 6 (1 = False, 2 = Mostly false, 3 = More false than true, 4 = More true than false, 5 = Mostly true, and 6 = True). More specifically, the instrument is composed of 11 subscales, nine of which are designed to tap perceptions of self related to specific areas of physical fitness and competence (i.e., strength, body fat, physical activity, endurance/fitness, sports competence, coordination, health, appearance, and flexibility), one that measures self-perceptions of global physical competence, and one that measures global self-esteem. 19 question items require reverse scoring due to negative wording. The aim of the reverse scoring is to prevent participants from making consistent answer. Validity and reliability of the PSDQ has

been supported with college students (Marsh, Asci, & Tomas, 2002). The Cronbach's alpha coefficient in their study was .94.

Social Physique Anxiety Scale-7

The Social Physical Anxiety Scale (SPAS) is an instrument for assessing the level of social physique anxiety, and was designed by Hart et al. (1989). The SPAS consisted of seven questions (e.g., 'Unattrative features of my physique, figure make me nervous in certain social settings') with responses made on five-point Likert-type scales ranging from (1) Not at all, (2) Slightly, (3) Moderately, (4) Very, TO (5) Extremely. This study used a seven-item version of the scale. In previous research, there was a substantive systematic method effect found to be attributable to the items which were positively worded (Hagger et al., 2007). Therefore, the questions worded positively in the SPSA were eliminated from the analysis.

Data Collection and Analysis

This study used secondary data collected in May 2011 by two reviewers for this project that was approved by Institutional Review Board (IRB) from the university (i.e., IRB approval #10080). In this study, SPSS version 19 was

used to analyze the data. To measure demographics, this study used frequency and descriptive analysis to draw the result of mean, standard deviation, percentile, and range for participants. T-tests and one-way ANOVAs were conducted to examine statistical differences on the levels of physical activity, physical self-concept, and social physique anxiety, considering factors of demographics, such as gender, major, year of college, ethnicity, and BMI. To analyze the main purpose of this study, associated with the difference of physical self-description and social physique anxiety by different levels of physical activity, this study used One-way ANOVA. Furthermore, as a Post-hoc test, Duncan was measured to investigate more specific differences within groups. Lastly, Pearson's correlation analysis was used to analyze any statistically significant relationship between physical self-description and social physique anxiety.

CHAPTER FOUR

RESULTS AND DISCUSSION

Results

This study included demographic factors, such as gender, GPA, major, standing in university, ethnicity, and BMI. Table 2 shows results of demographic information including the number, mean, standard deviation, and percentile of each factor for males and females, respectively. The interesting difference found between males and females was that a normal level of BMI in females was much more than that of males. In addition, the level of physical activity in males was higher than one in females.

Table 2. Descriptive Analysis for Demographics

Demographics	Gender		
	Male (n=99, 41.8%)	Female (n=139, 58.2%)	Total (n=238, 100%)
	M ± SD	M ± SD	M ± SD
GPA	2.91±0.38	3.00±0.41	2.97±0.40
Major			
Kinesiology	52 (52.5%)	62 (44.6%)	114 (47.9%)
Non-Kinesiology	47 (47.5%)	77 (55.4%)	124 (52.1%)

Year of College			
Freshmen	15 (15.6%)	23 (16.8%)	38 (16.3%)
Sophomore	14 (14.6%)	23 (16.8%)	37 (15.9%)
Junior	24 (25.0%)	41 (29.9%)	65 (27.9%)
Senior	43 (44.8%)	50 (36.5%)	93 (39.9%)
BMI			
Normal	32 (33.7%)	84 (63.6%)	116 (51.1%)
Overweight	38 (40.0%)	29 (22.0%)	67 (29.5%)
Obese	25 (26.3%)	19 (14.4%)	44 (19.4%)
Ethicity			
White	34 (35.1%)	53 (39.3%)	87 (37.5%)
Black	11 (11.3%)	12 (8.9%)	23 (9.9%)
Hispanic	50 (51.5%)	59 (43.7%)	109 (47.0%)
Asian/Pacific Islander	2 (2.1%)	11 (8.1%)	13 (5.6%)
GLTES			
Low	23 (23.2%)	56 (40.3%)	79 (33.3%)
Moderate	32 (32.3%)	48 (34.5%)	80 (33.3%)
High	44 (40.0%)	35 (25.2%)	79 (33.3%)

M = mean; SD = standard deviation; GPA = grade point average; BMI = Body Mass Index.

To gauge the difference in physical activity levels, physical self-concept, and social physique anxiety between males and females, independent t-tests were used. Table 3 shows significant gender differences on physical activity levels. The levels of physical activity of males were much

more active than females. Factors of PSDQ, except for body fat, flexibility, and global self-esteem show that there was a significant difference between genders on health, coordination, physical activity, sport competence, general physical self-concept, appearance, strength, and endurance. In addition, there was a significant difference on social physique anxiety between genders.

Table 3. T-test for Differences in Physical Activity Levels, Physical Self-Concept, and Social Physique Anxiety between Genders

	Male Mean (SD)	Female Mean (SD)	T-value
GLTES	56.23 (26.70)	46.72 (24.30)	2.851**
PSDQ			
1.Health	40.79 (5.40)	37.65 (7.97)	3.29***
2.Coordination	30.15 (4.66)	26.95, (5.90)	4.58***
3.Physical Activity	28.71 (7.16)	24.71 (8.84)	3.82***
4.Body Fat	24.73 (10.29)	24.50 (9.81)	0.17
5.Sport Competence	29.21 (6.68)	25.48 (7.36)	3.93***
6.General Physical self-concept	27.26 (6.61)	24.51 (7.42)	2.93**
7.Appearance	29.52 (6.03)	28.02 (5.27)	2.01*
8.Strength	29.05 (5.62)	25.24 (6.33)	4.69***
9.Flexibility	25.38 (6.70)	25.82 (6.42)	-.49
10.Endurance	24.85 (8.33)	22.45 (8.95)	2.05*
11.Self-Esteem	43.61 (7.14)	42.22 (5.35)	1.69
Social Physique Anxiety	17.50 (6.93)	20.35 (6.78)	-3.13**

* $p < .05$, ** $p < .01$, *** $p < .001$

Results of the t-tests on physical activity levels, physical self-concept, and social physique anxiety showed significant mean differences between kinesiology and non-kinesiology (see Table 4). In addition, there were statistical differences between kinesiology and non-kinesiology on three factors of PSDQ, such as coordination,

physical activity, and sport competence.

In addition, even though there was a no significant difference in social physique anxiety, participants in non-kinesiology (mean = 18.71) reported higher level of anxiety than ones in kinesiology (mean = 19.66).

Table 4. T-test for Differences in Physical Activity Levels, Physical Self-Concept, and Social Physique Anxiety between Majors

	Kinesiology (Mean, SD)	Non-Kinesiology (Mean, SD)	t-value
GLTES	57.44,±25.03	44.46, ±24.90	4.01***
PSDQ			
1. Health	39.27, ±7.62	38.63. ±6.78	0.66
2. Coordination	29.61, ±4.51	27.08, ±6.28	3.50***
3. Physical Activity	28.62, ±6.89	24.30, ±9.13	4.09***
4. Body Fat	24.98, ±9.68	24.25, ±10.29	0.23
5. Sport Competence	29.39, ±5.66	24.89, ±7.98	4.95***
6. General Physical Self-Concept	26.24, ±6.85	25.08, ±7.52	1.24
7. Appearance	28.95, ±5.37	28.35, ±5.87	0.81
8. Strength	27.52, ±5.84	26.11, ±6.69	1.69
9. Flexibility	26.04, ±6.01	25.28, ±6.97	0.89
10.Endurance	24.62, ±8.78	22.36, ±8.64	1.96
11.Self-Esteem	43.51, ±6.36	42.12, ±5.94	1.71
Social Physique Anxiety	18.71, ±7.06	19.66, ±6.87	-1.04

* p <.05, ** p <.01, *** p <.001

The difference among years of college in physical activity levels was statistically significant. As a result of Duncan test, the difference within the groups was the highest level of physical activity in junior group. Additionally, there were significant differences in four different factors of PSDQ, such as coordination, physical activity, and sport competence, and global self-esteem. As a result of Duncan test, the difference within the groups of coordination (II < III), physical activity (II < III), and sport competence (I, II < III) was the highest level of physical self-concept in junior group. Meanwhile, the difference within the groups of global self-esteem (II < I, III, IV) was the lowest level of physical self-concept in sophomore group.

Table 5. One-way ANOVAs for Differences in Physical Activity Levels, Physical Self-Concept, and Social Physique Anxiety among Years of College.

	The Year of College					
	I.1st	II.2nd	III.3rd	IV.4th		Post
	M (SD)	M (SD)	M (SD)	M (SD)	F	-Hoc
GLTES	45.79 ±27.96	45.84 ±24.79	59.75 ±26.40	48.37 ±23.86	3.93**	I,II, IV<III
PSDQ						
1. Health	38.76 ±7.64	40.14 ±5.97	37.73 ±8.46	39.09 ±6.48	.892	
2. Coordination	26.76 ±7.32	26.32 ±5.69	29.42 ±4.82	28.89 ±5.08	3.574*	II<III
3. Physical Activity	24.37 ±9.41	23.06 ±9.72	28.79 ±6.77	26.63 ±7.96	4.550**	II<III
4. Body Fat	24.89 ±9.04	23.72 ±11.14	26.17 ±9.71	23.91 ±9.94	.772	
5. Sport Competence	25.00 ±8.28	24.78 ±8.25	28.96 ±6.57	24.47 ±6.75	3.681*	I,II <III
6. General Physical Self-Concept	25.42 ±6.43	24.63 ±8.95	26.50 ±6.44	25.53 ±7.25	.564	
7. Appearance	28.08 ±5.00	27.14 ±6.66	29.50 ±5.12	28.93 ±5.64	1.553	
8. Strength	26.73 ±6.87	25.62 ±6.62	27.48 ±5.96	26.76 ±6.29	.664	
9. Flexibility	25,32 ±6.74	24.44 ±6.55	26.77 ±6.33	25.52 ±6.40	.811	
10. Endurance	22.24 ±7.94	22.72 ±8.96	25.11 ±8.26	23.06 ±9.19	1.109	
11. Self-Esteem	42.68 ±4.73	40.02 ±7.96	44.22 ±7.30	42.82 ±4.72	2.295*	II<I, III,IV
Social Physique Anxiety	19.13 ±6.31	20.16 ±6.92	18.90 ±7.31	19.06 ±7.08	.281	

* $p < .05$, ** $p < .01$

Table 6. One-way ANOVAs for Differences in Physical Activity Levels, Physical Self-Concept, and Social Physique Anxiety among Levels of Body Mass Index

	The levels of BMI				
	I. Normal	II. Over weight	III. Obese	*F*	Post -Hoc
	M (SD)	M (SD)	M (SD)		
GLETS	52.89 ±25.01	52.91 ±23.66	44.75 ±30.43	1.77	
PSDQ					
1. Health	38.54 ±7.39	39.32 ±7.83	39.82 ±6.15	.56	
2. Coordination	29.17 ±5.17	28.39 ±6.09	26.19 ±5.68	4.47*	III <II,I
3. Physical Activity	26.69 ±8.44	27.52 ±8.03	34.48 ±8.80	1.79	
4. Body fat	29.87 ±7.01	22.36 ±9.03	12.40 ±5.02	89.50***	III<II <I
5. Sport Competence	27.71 ±6.77	27.31 ±7.84	25.38 ±7.80	1.16	
6. General Physical Self-Concept	27.59 ±6.37	25.89 ±6.86	19.84 ±7.20	21.53***	III <II,I
7. Appearance	29.79 ±4.50	28.90 ±4.84	24.83 ±7.70	13.47***	3<2,1
8. Strength	26.40 ±6.07	27.71 ±6.19	26.83 ±7.50	.86	
9. Flexibility	27.29 ±6.25	25.57 ±6.73	22.11 ±5.95	10.69***	III <II,I
10. Endurance	26.18 ±8.22	23.95 ±8.20	16.59 ±7.33	22.52***	III <II,I
11. Self-Esteem	43.05 ±5.22	43.85 ±7.62	40.13 ±6.23	4.94	III <I,II
Social Physique Anxiety	17.84 ±6.65	19.53 ±7.27	23.29, ±6.12	10.42***	I,II <III

*P<.05, **p<.01, ***p<.001

As a result of differences in physical activity levels, physical self-concept, and social physique anxiety among three levels of BMI, the difference among the groups in physical activity levels was not statistically significant. However, it showed that obese group was the lowest level of physical activity. Meanwhile, seven different factors of PSDQ, such as coordination, body fat, general physical self-concept, appearance, flexibility, endurance, and global self-esteem showed that there were significant differences among the groups. As a result of Duncan test, obese group was the lowest level of physical self-concept. In addition, there was a statistical difference in social physique anxiety among the BMI groups. In this case, obese group was the highest level of SPA (I, II < III).

As a result of difference in physical activity levels, physical self-concept, and social physique anxiety among four different ethnic groups, only two factors (i.e., physical activity and sport competence) showed that there were significant differences among ethnicity groups. Interestingly, Post Hoc test using Duncan showed that Asian reported the lowest level of physical self-concept (see Table 7).

Table 7. One-way ANOVAs for Differences in Physical Activity Levels, Physical Self-Concept, and Social Physique Anxiety among Ethnicity

	Ethnicity					
	I. White	II. Black	III. Hispanic	IV. Asian		Post
	M (±SD)	M (±SD)	M (±SD)	M (±SD)	*F*	-Hoc
GLTES	54.53 26.44	49.13 24.48	49.40 25.78	40.15 18.40	1.507	
PSDQ						
1. Health	39.08 (7.32)	39.57 (7.52)	38.57 (6.93)	41.62 (4.23)	.775	
2. Coordination	28.70 (6.06)	30.48 (4.24)	27.81 (5.11)	27.08 (5.89)	1.84	
3. Physical Activity	27.83 (8.53)	25.78 (7.56)	26.52 (7.94)	19.46 (9.28)	4.03**	IV<II,I III,I
4. Body Fat	24.68 (9.96)	22.95 (11.9)	24.66 (9.74)	27.84 (8.31)	.654	
5. Sport Competence	28.47 (6.97)	27.60 (7.62)	26.09 (7.27)	23.00 (8.06)	2.98*	IV<II,I
6. General Physical Self-Concept	26.11 (6.86)	25.13 (7.94)	25.44 (7.38)	25.92 (6.76)	.191	
7. Appearance	28.33 (5.47)	31.52 (5.74)	28.18 (5.84)	28.72 (4.57)	2.15	
8. Strength	27.54 (6.12)	28.33 (4.96)	25.87 (6.39)	26.07 (8.16)	1.63	
9. Flexibility	25.37 (6.67)	27.85 (5.76)	25.71 (6.43)	23.25 (7.36)	1.40	
10. Endurance	24.58 (9.76)	21.73 (8.80)	23.35 (7.86)	19.75 (7.64)	1.49	
11. Self-Esteem	43.64 (7.35)	43.39 (4.81)	41.97 (5.61)	42.38 (4.17)	1.22	
Social Physique Anxiety	18.80 (7.05)	18.82 (7.22)	19.72 (7.16)	18.92 (4.46)	.314	

* $p < .05$, ** $p < .01$

Table 8. One-way ANOVAs for Differences in Physical Self-Concept and Social Physique Anxiety among Physical Activity Levels

	Levels of physical activity				
	I Low	II Moderate	III High		Post
	M (SD)	M (SD)	M (SD)	*F*	-Hoc
PSDQ					
1. Health	38.47 (7.71)	39.42 (6.65)	38.93 (7.30)	.325	
2. Coordination	26.49 (6.07)	28.12 (4.66)	30.18 (5.55)	8.61***	I,II<III
3. Physical Activity	20.78 (8.92)	26.58 (7.24)	31.61 (4.80)	44.46***	I<II<III
4. Body fat	23.65 (10.62)	25.13 (9.24)	25.03 (10.09)	.5311	
5. Sport Competence	24.28 (8.46)	27.24 (6.71)	29.48 (5.67)	10.48***	I<II<III
6. General Physical Self-Concept	24.75 (8.04)	26.05 (6.65)	27.11 (6.54)	4.55*	I<II,III
7. Appearance	27.96 (6.11)	28.93 (5.47)	29.02 (5.39)	.84	
8. Strength	24.61 (7.10)	25.97 (5.72)	29.70 (4.95)	14.98***	I,II<III
9. Flexibility	24.68 (7.11)	25.14 (6.02)	27.09 (6.25)	3.02*	I<III
10. Endurance	19.14 (8.80)	23.18 (8.10)	27.64 (7.52)	18.38***	I<II<III
11. Self-Esteem	41.90 (5.70)	42.84 (7.59)	43.66 (4.77)	1.53	
Social Physique Anxiety	20.03 (5.70)	18.97 (6.50)	18.59 (7.37)	.89	

* $P < .05$, *** $p < .001$

One-way ANOVAs were analyzed to measure the effects of different levels of physical activity on physical self-concept and social physique anxiety. The PSDQ factors, such as coordination, physical activity, sport competence, general physical self-description, strength, flexibility, and endurance, except for health, body fat, appearance, and global self-esteem showed that there were significant differences among the three levels of physical activity. The result of Post-hoc showed that the group in strenuous level of physical activity was the highest level of physical self-concept. On the other hand, the group in the low level of physical activity was the lowest level of physical self-concept. In addition, even though there was no statistical difference in social physique anxiety among the levels of physical activity, it showed that those who were vigorous for physical activity tend to be less social physique anxiety than any other ones.

Table 9. Correlation between Social Physique Anxiety and Physical Self-concept by Genders

	Correlation coefficient (r) Social Physique Anxiety		
	Male	Female	All
PSDQ	-.72**	-.54**	-.62**
1.Health	-.10	-.24**	-.23**
2.Coordination	-.51**	-.21*	-.35**
3.Physical Activity	-.11	-.16	-.18*
4.Body Fat	-.67**	-.64**	-.64**
5.Sport Competence	-.45**	-.18*	-.32**
6.Physical Self-Concept	-.81**	-.61**	-.69**
7.Appearance	-.73**	-.49**	-.60**
8.Strength	-.29**	-.27**	-.32**
9.Flexibility	-.49**	-.23**	-.32**
10.Endurance	-.50**	-.24**	-.35**
11.Self-Esteem	-.42**	-.38**	-.40**

* $p < .05$, ** $p < .01$

Lastly, correlation analysis was conducted to measure correlation coefficient (r) between physical self-concept and social physique anxiety. Overall, physical self-concept was statistically associated to social physique anxiety. It shows clearly that higher scores on physical self-concept were inversely associated with social physique anxiety. Specifically, body fat, physical self-concept, and appearance demonstrated relatively high correlations with

social physique anxiety. Figure 1 shows a negative correlation between physical self-concept and social physique anxiety.

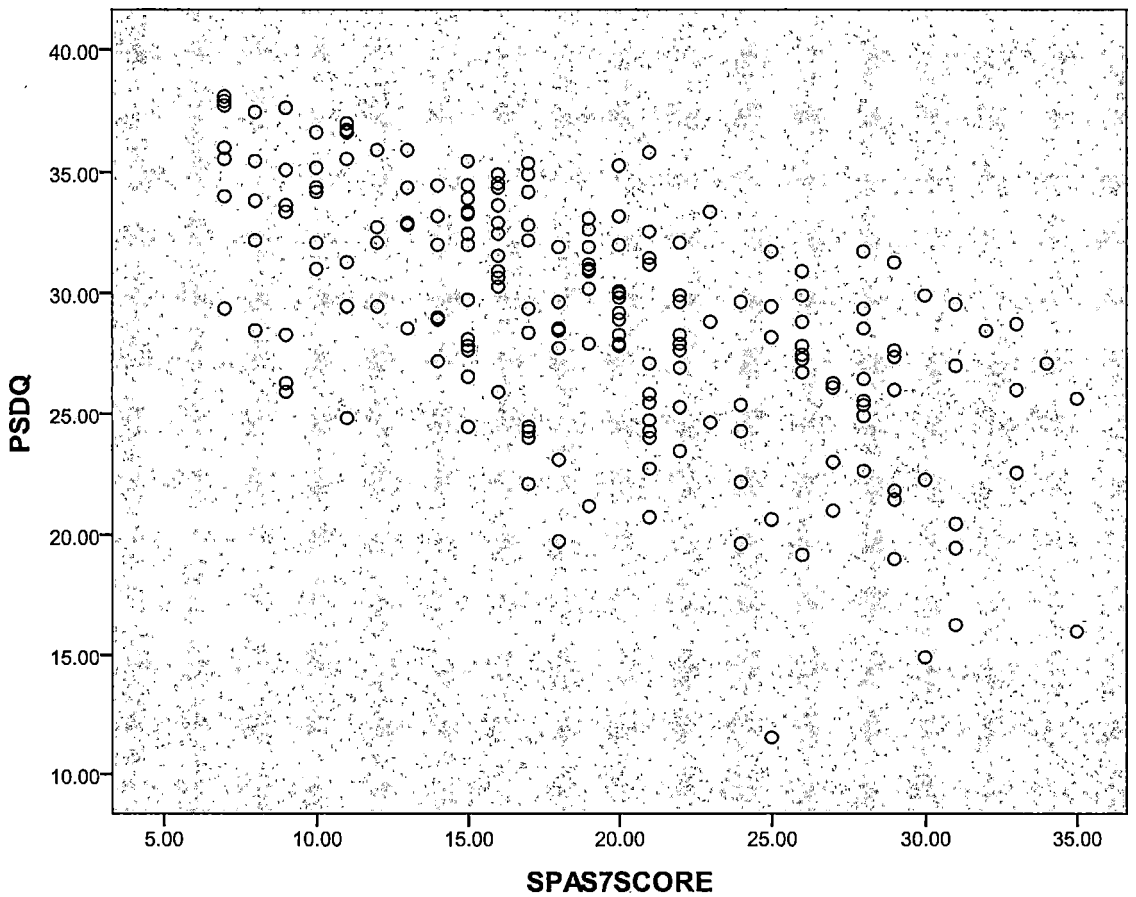

Figure 1. Scattergram Illustrating Negative Correlation: The Relationship between Physical Self-Concept and Social Physique Anxiety

Discussions

This study was to examine the importance of physical activity on physical self-concept and social physique anxiety among college students.

First, prior to analyzing the main purpose, this study analyzed differences in the level of physical activity, physical self-concept, and social physique anxiety according to demographic factors, such as genders, majors, years of college, BMI, and ethnicity. Interestingly, there were significant differences in almost all factors of the three dependent variables according to genders and BMI.

Second, as a main objective of this study, it showed that there were statistical differences in eight factors of PSDQ among the levels of physical activity. According to this result, students who participated in vigorous physical activity perceived higher physical self-concept than those who participated in less physical activity. This result supports previous studies, showing that people who have high belief and perceived competence and autonomy are likely to engage in vigorous levels of physical activity (Wang, Chia, Quek, & Liu, 2006; Biddle, Wang, Chatzisarantis, & Spray, 2003). With respect to social physique anxiety, even though there was no significant

difference in social physique anxiety among physical activity levels, the result showed that those who are physically active tend to feel less social physique anxiety than those who are inactive.

Third, there were statistically negative correlations between social physique anxiety and physical self-concept. Additionally, a correlation coefficient of males as a value of the correlation was higher negatively than females' one. According to previous study by Leary and Kowalski (1990), people who have high levels of physical self tend to be competent in showing others their appearance in situation where they are evaluated from others, would like to display their physique, which means that they have lower level of social physique anxiety.

CHAPTER FIVE

CONCLUSION

Even though the importance of physical activity in providing positive effects on physical and mental aspects has been well established by several researchers (Fletcher & Banasik, 2001; Fiske, Wetherell, & Gatz, 2009; Craft, 2005), the level of physical activity has been decreasing in college students. As previous studies (Russell, 2002; Russell & Cox, 2003; Marsh & Redmayne, 1994) suggested that physical activity has a positive effect on physical self-description and social physique anxiety; this study also found that vigorous physical activity plays pivotal roles for college students in increasing physical self-description and decreasing social physique anxiety.

For future study, specific ways to increase the level of physical activity should be further studied to make it possible for people not only to improve physical development, but also to cultivate strong mental states.

APPENDIX A

SURVEY INSTRUMENTS

NOTE: Pages 38-41 were a photocopy of the test instrument and have been removed by the CSUSB ScholarWorks administrators to avoid possible copyright violations.

GLTES

Godin, G., & Shephard, R. J. (1997). Godin leisure-time exercise questionnaire. *Medicine and Science in Sports and Exercise, 29*, 36-38.

PSDQ

Marsh, H. W., Richards, G. E., Johnson, S., Roche, L., & Tremayne, P. (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology, 16*, 270-305.

SPAS-7

Hart, E. A., Leary, M. R., & Rejeski, W. J. (1989). The measurement of social physique anxiety. *Journal of Sport & Exercise Psychology, 11*, 94-104.

APPENDIX B

CSUSB APPROVAL LETTER

Date 5/16/2011

Jeeyoung Kim
Dr. So
c/o:
Department of Kinesiology
California State University
5500 University Parkway
San Bernardino, California 92407

CSUSB
INSTITUTIONAL
REVIEW BOARD
Administrative Review
IRB# 10080
Status
APPROVED

Dear: Dr. So and Ms. Kim.

Your application to use human subjects has been reviewed and approved by the Chair of the Institutional Review Board (IRB) of California State University, San Bernardino and concurs that your application meets the requirements for exemption from IRB review Federal requirements under 45 CFR 46. As the researcher under the exempt category you do not have to follow the requirements under 45 CFR 46 which requires annual renewal and documentation of written informed consent which are not required for the exempt review category. However, exempt status still requires you to attain consent from participants before conducting your research.

The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.

Although exempt from federal regulatory requirements under 45 CFR 46, the CSUSB Federal Wide Assurance does commit all research conducted by members of CSUSB to adhere to the Belmont Commission's ethical principles of respect, beneficence and justice. You must, therefore, still assure that a process of informed consent takes place, that the benefits of doing the research outweigh the risks, that risks are minimized, and that the burden, risks, and benefits of your research have been justly distributed.

You are required to do the following:

1) Protocol changes must be submitted to the IRB for approval (no matter how minor) before implementing in your prospectus/protocol. Protocol Change Form is on the IRB website.
2) If any adverse events/serious adverse/unanticipated events are experienced by subjects during your research. Form is on the IRB website.
3) And, when your project has ended.

Failure to notify the IRB of the above, emphasizing items 1 and 2, may result in administrative disciplinary action.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Compliance Coordinator. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at [redacted]. Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

[redacted]

Sharon Ward, Ph.D, Chair
Institutional Review Board

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