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Motivations In Exercise

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MOTIVATIONS IN EXERCISE

By

Amanda Dufner
Bachelor of Science, University of North Dakota, 2014

A thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

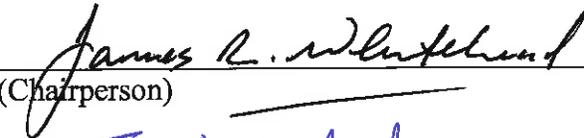
Masters of Science

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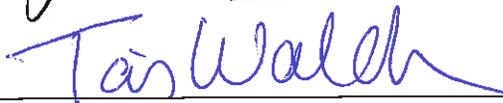
December

2016

This thesis, submitted by Amanda Dufner in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.



(Chairperson)





This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the Graduate School at the University of North Dakota and is hereby approved.



Dean of the School of Graduate Studies



Date

Title: Motivations in Exercise
Department: Kinesiology & Public Health Education
Degree: Master of Science

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Amanda Dufner
December 2016

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ABSTRACT

College students exercise for a variety of reasons, but specific differences in their motivations and perceptions have not been extensively studied. PURPOSE: The main purpose was to see if students whose primary reason for exercise is to lose fat (FATCON), gain muscle mass (MUSC), or maintain health (HLTH) had differences in their exercise motivations, social physique anxiety, and body image self-perceptions.

A secondary purpose was to explore if the participants' supplement use reflected their exercise priorities.

METHODS: Data were collected at a university Wellness Center, or from exercise classes. Participants ($N = 216$) completed a packet of four questionnaires: Multidimensional Body Self Relations Questionnaire (MBSRQ), Social Physique Anxiety Scale (SPAS), The Behavioral Regulation of Exercise Questionnaire (BREQ-3), and an ad hoc Dietary Supplement Questionnaire (DSQ).

RESULTS: MANOVA revealed a significant difference between groups ($F(14, 350) = 4.89, p < .001$). Post hoc tests showed significant differences between groups on six out of seven dependent variable scales. Specifically, MUSC was significantly higher in autonomous motivation than FATCON and HLTH ($p < .001$), but FATCON scores on SPAS, appearance evaluation, body areas satisfaction, overweight preoccupation, and self-weight classification were all less positive than the scores of MUSC and HLTH ($p < .001$ to $p < .005$). Supplement use was low in HLTH (11%), FATCON (15%), but higher in MUSC (49%). In addition, some of the supplements listed by MUSC were of questionable efficacy and safety.

CONCLUSIONS: The majority of these college student exercisers were autonomously motivated, but those who exercised primarily for fat control had more negative body-related perceptions than those who exercised primarily for health, or for muscle gain reasons. Additionally, the data on supplement use indicates a need for consumer education, especially for those who report they are exercising primarily to gain muscle.

INTRODUCTION/LITERATURE REVIEW

Obesity has become a pandemic worldwide (Popkin, Adair, & Ng, 2012). In 2008, 1.5 billion adults were estimated to be overweight and obese (Popkin, Adair, & NG, 2012). It is predicted that by 2030 2.16 billion adults worldwide will be overweight and 1.12 billion will be obese (Popkin, Adair, & Ng, 2012). What can professionals do to help aide in lowering the number of overweight/obese people as well as decrease health care costs estimated at 147 billion per year that occur because of this pandemic (Ling, et al., 2014)? One solution is physical activity. Researchers have consistently shown a link between lack of exercise and obesity. Therefore, finding what motivates someone to exercise is a pivotal starting point in getting someone active. Whether its leisure, play, or recreational, the point is to find what someone takes interest in and help them get moving. This paper will look at the etiology of obesity, what physical activity is, how people are motivated and how motivation can influence how someone views their body, and lastly how the use of dietary supplements can play a part in someone's health.

History: Etiology of Obesity

The nineteenth and twentieth centuries saw the growth of the food supply as well as the industrialization of the U.S. economy expanding access to nutritional knowledge (Tillotson, 2004). With a large amount of food being fully prepared as well as the high availability of food at lower costs, people have turned to eating and drinking as a form of entertainment which in turn has led to increased calories consumed (Tillotson, 2004).

However, with the industrialization of the amount of available food supply to the public there also came increased knowledge on nutrition.

Tillotson (2004) states that although an increase in knowledge of nutrition has been beneficial, it does not change the fact that in addition to people consuming more calories, Americans have also become increasingly less active. Whether people work long hours at a sedentary job or refuse to be active, the problem remains a lack of adequate physical activity. While the recommendations and benefits of physical activity may be well known among some, others may be unaware of the basic guidelines when it comes to exercise. Therefore, it is important to explore what physical activity is, and the ways in which it can help aide in lowering obesity rates.

Physical Activity

Physical activity is defined as “any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure (Thompson, Gordon, & Pescatello, 2014, p.2). In addition to identifying physical activity, it is important to define the range of intensities of physical activity and how they are measured. Thompson et al., stated some examples of how intensities are measured which include heart rate (HR), oxygen consumption (Vo₂) or metabolic equivalent (METS). Thompson et al. (2014) went onto identify light physical activity as less than 3 METS with examples such as walking, sitting using a computer, washing dishes, ironing and preparing food. Thompson et al. (2014) further identified moderate and vigorous METS. Moderate METS are defined as 3 to less than 6 which may include activities such as cleaning windows, cleaning cars, sweeping floors or carpet, vacuuming, and stacking wood. Vigorous METS are defined as greater than or equal to 6

METS which include jogging, shoveling sand, carrying heavy loads, heavy farming, and playing a game of basketball (Thompson et al., 2014).

Knowing how to quantify intensities of physical activity is useful when aiming for the ACSM-AHA (2014) Primary Physical Activity Recommendations.

Recommendations include:

- All healthy adults aged 18-65 should participate in moderate intensity aerobic physical activity for a minimum of 30 minutes on 5 days per week or vigorous intensity, aerobic activity for a minimum of 20 minutes on 3 days per week.
- Combinations of moderate and vigorous intensity exercise can be performed to meet this recommendation.
- Moderate intensity, aerobic activity can be accumulated to total the 30 minutes minimum by performing bouts lasting greater than or equal to 10 minutes.
- Every adult should perform activities that maintain or increase muscular strength and endurance for a minimum of 2 days per week.

(Thompson, Gordon, & Pescatello, 2014, p. 8)

With achieving the recommendations for physical activity also comes the benefits. Loi et al., (2014) declared that physical activity is known to produce both psychological and physical health benefits. In a study looking at the effects of physical activity on well-being in female caregivers it was found that those who participated in physical activity while taking care of their patients experienced less stress, depression, and fewer burdens (Loi et al., 2014). In addition to these physical benefits, psychological effects of exercise include improvement in cognitive function and sleep (Loi et al., 2014). Physical activity has also been shown to reduce the risk of cardiovascular diseases and pulmonary function, minimize falls, improve pain management, improve balance, gait and endurance, and also delay mobility limitations (Loi, et al., 2014). However, despite the known

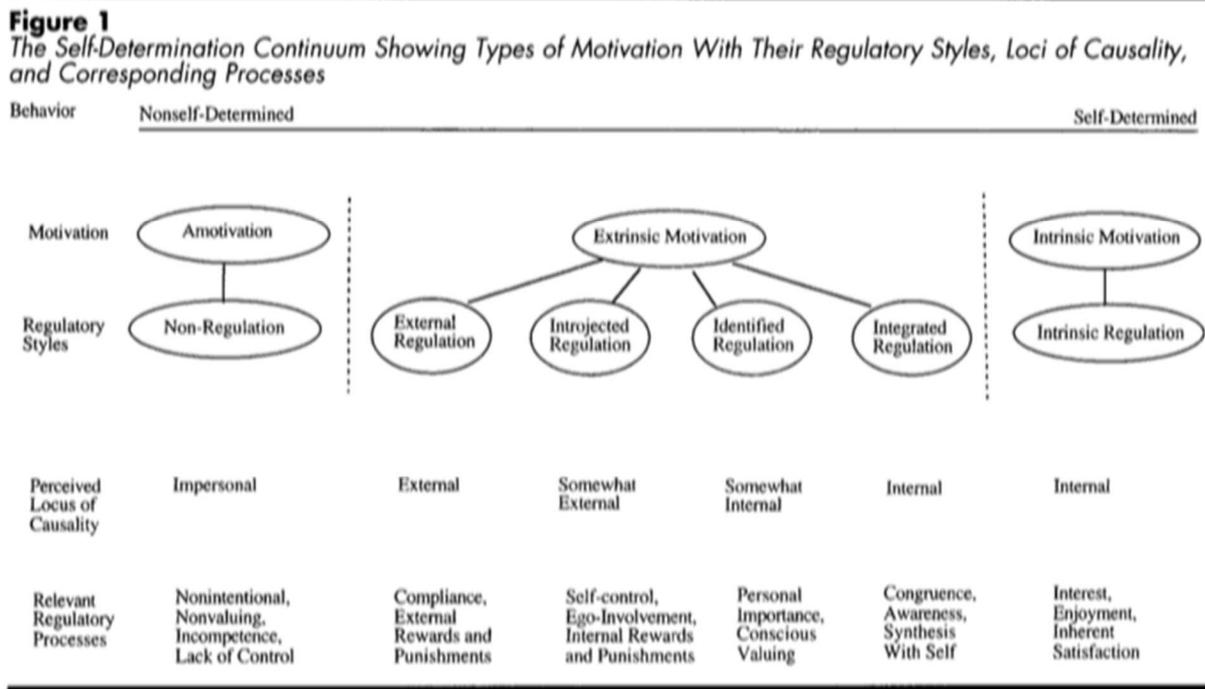
benefits, many Americans still fail to meet the adequate amount of physical activity. One way to solve this problem may be to explore what motivates people to exercise, and design programs based upon those motivations.

Motivations

While Loi et al. suggest that there are benefits associated with physical activity, Ryan and Deci (2000) suggest that in order for these benefits to be used for motivation they must correspond to satisfying at least one of our three basic psychological needs. Self-Determination Theory (SDT) lists these needs as *competence*, *autonomy*, and *relatedness* (Ryan & Deci, 2000). Competence is when a person feels that they can master or control a task, autonomy relates to having someone feel in control of their life, and relatedness is associated with the need to have close relationships with others (Ryan & Deci, 2000).

Ryan and Deci (2000) stated that there are three different types of motivation as well. The three types are amotivation, extrinsic, and intrinsic. Amotivation is “the state of lacking the intention to act (Ryan & Deci, 2000, p.72),” this type is where people either do nothing at all, or act, but in a mindless manner thinking they lack competency to complete the task. Ryan and Deci (2000) go onto explain what intrinsic and extrinsic motivation is. Intrinsic motivation involves seeking to complete tasks, explore, or learn for the satisfaction of oneself (Ryan & Deci, 2000). There are no outside rewards or punishments in this type of motivation, rather people simply engage in activities for their own enjoyment (Ryan & Deci, 2000). It is shown that those who experience a greater sense of competence and autonomy in tasks are more likely to be intrinsically motivated (Ryan & Deci, 2000). The third type of motivation is called extrinsic motivation. Extrinsic motivation is when people participate in an activity for a separate outcome (Ryan & Deci, 2000). It no longer is out of the inherent satisfaction of oneself (intrinsic), but it is

now for an attainable reward or to avoid punishment (Ryan & Deci, 2000). The table below displays the three categories of motivation identified by the researchers, and further descriptions on the subgroups of each.



While all three categories of motivation have been shown to be commonly related to reasons for exercise, introjected regulation, has been known to play a big role in how someone views their body. Body image can have a big impact on a person’s motivation in exercise so it is important to explore the influences of body image as related to motivation and exercise.

Body Image

According to the APA Dictionary of Psychology, body image is defined as “the mental picture one forms of one’s body as a whole, including both its physical and functional

characteristics (BODY PERCEPT) and one's attitudes toward these characteristics (BODY CONCEPT)" (Body image, 2007, p.128). Duggan and Smith (2014) stated that many different things can influence body image, particularly media which consists of television, advertising, magazines, and the internet. It is worth noting that 73% of U.S. adults in 2013 reported visiting at least one social networking site, and 42% used more than one (Duggan & Smith, 2014). While Duggan and Smith (2014) stated what can influence a person's body image and how often one uses the media, Perloff (2014) went on to examine the differences in gender when determining how people are affected by media. With both males and females being users of social networking sites, Perloff (2014) found that there seems to be a far greater concern for the effect media has on women's body image. Perloff (2014) stated that those women who have lower self-esteem and are consistently striving for the perfect body are that much more susceptible to and influenced by media images of a thin ideal.

With studies done specifically on the negative effects media has on women's self-image, there is hope for a potential positive effect media can have on self-image as well. In a study done by Yu. (2014), 380 female college students were asked to take a web-based survey on the effects of viewing thin-idealized body images versus non-thin idealized body images. The results indicated that those who were exposed to the thin-idealized body image showed greater body dissatisfaction than those exposed to the non-thin idealized body images (Yu, 2014). The results of the study indicating lower body dissatisfaction when exposed to thin idealized body images alludes to the idea of developing a greater positive body image by using the non-idealized body image more in the media in the hopes of lowering the body dissatisfaction rates. Another interesting influence on body image may be tied to gender/culture differences (Perloff, 2014).

Gender/Cultural differences

Both genders generally strive for a more visually appealing body. However, there are often very different ideas of what is visually appealing based upon a person's gender and culture (Capodilupo and Kim, 2014). While Yu. (2014) found that women in his study preferred to encompass a thin ideal, Capodilupo and Kim (2014) found that this idea of an ideal image can be variable based upon a person's ethnicity. For instance, in Kim and Capodilupo's (2014) article titled "Gender and race matter: The importance of considering intersections in black women's body image," 26 women were identified as racially black and placed in focus groups to assess their own body satisfaction. It was found that African American women tended to be more satisfied with their bodies, and were less likely to strive after a thin ideal which Capodilupo and Kim (2014) hypothesized could be due to differences in cultural constructions of femininity.

In addition to studies that considered ethnicity, Markey and Markey (2014) also considered the role of sexual preferences in body image. The authors looked at lesbian and heterosexual relationships and the way the partners' viewed their body image based upon their partner's expectations, their current weight, and their partner's weight. They figured out how their partners viewed their body image by filling out questionnaires based upon their current BMI, and what their ideal body image was. Markey and Markey (2014) concluded that women in lesbian relationships tended to have a more positive attitude toward their body image versus women in heterosexual relationships. However, in general, those with thinner partners tended to be at greater risk for viewing their body image as poor (Markey & Markey, 2014).

In addition to the impact various categories of identity such as ethnicity and sexual preference have on individuals' body image, location can also impact how a person perceives

their own body (Paulk, Dowd, Zayac, Eklund, & Kildare, 2014). Paulk et al. (2014) looked at the way people from the Pacific Northwest and Southeast parts of the United States viewed their body image by giving surveys to students at Universities in these regions. Paulk et al. (2014) found that women in the Southeast part of the United States tended to view their body image the poorest. The researchers hypothesized that the reason women from the Southeast part of the United States tend to have lower body satisfaction could be due to either the way people tend to judge their bodies based on standard beauty in this particular area or climate differences leading to a different dress code (Paulk et al., 2014).

Even though most research on body image tends to focus on women, Farquhar and Wasylkiw (2007) found that men also have varying perceptions of body image. Farquhar and Wasylkiw (2007) found that men typically strive for a very different type of body ideal being more muscular with a very low body fat percentage. Just like Yu (2014) found differences on how body image is perceived based on the media in women, Farquhar and Wasylkiw (2007) also found the same to be true in men. With men's body dissatisfaction tripling in the past 30 years, some hypotheses of this increase could be due to the increased masculinity of male models in the media, action figure toys such as G.I. Joes biceps increasing from 12.2 inches in circumference to 26.8 inches, or the increased muscle mass of 27 pounds on models in magazines such as Playgirl (e.g., Garner, 1997; Pope, Olivardia, Gruber, & Borowiecki, 1999; (Leit, Pope & Gray, 2000). With the pressure to encompass an aesthetically appealing body image affecting both women and men's perspectives, one way that people attempt to achieve these ideals is with the use of a dietary supplement.

Dietary Supplements

Dietary supplements were defined by Congress in the 1994 Dietary Supplement Health and Education Act (DSHEA) as:

- A product that is intended to supplement a diet that contains or bears one or more of the following ingredients: vitamins, minerals, and herbs or other botanical, an amino acid, a product to increase total daily intake, a concentrated metabolite, constituent, or any combination of the above ingredients.
- Is intended to be consumed as a pill, capsule, tablet, or liquid.
- Is not considered a conventional food or as a sole item of a meal or diet.
- Is labeled a “dietary supplement”
- Includes products such as an approved new drug, certified antibiotic, or licensed biologic that was marketed as a supplement or food before approval, certification, or license (Heule, 2001, p.6).

Frequency of dietary supplements

According to Gerald and Dorothy (2014) about half of all US adults take a dietary supplement that may include , for example, an exotic extract has claims to improve brainpower and lose weight, or a multivitamin, resulting in an estimated 32 billion dollars in sales per year. In a study conducted by Froiland, Koszewski, HIngst, and Kopecky (2004) that looked at supplement use among college athletes, 115 male and 88 female varsity athletes were invited to take a survey that asked them to define what a supplement was, report their use and type, their source of information, and reasons for use. The results indicated that 89% of athletes had or were currently using a nutritional supplement (Froiland et al., 2004). Froiland et al. (2004) found that female athletes were more likely to take calcium and multivitamins, while males were more likely to take ginseng, amino acids, whey protein, glutamine, hydroxy-methyl-buterate (HMB),

weight gainers, and Juven. The most frequently used supplements Froiland et al. (2004) concluded to be used were energy drinks, calorie replacement products, multivitamins, creatine, and vitamin C. The researchers further identified that females were more likely to gain their information from family members, while males gained most of their information from a store nutritionist, fellow athletes, friends, or a coach (Froiland et al., 2004). Females were more likely to take a supplement for health because of inadequate diet, while males were more likely to take a supplement for speed, agility, strength, power, and muscle/weight gain (Froiland, et al., 2004). While researchers have looked at the reasons why people may take supplements, it is also important to be aware of the potential risks if people decide to take a dietary supplement, because of issues with regulations.

Risk of Dietary Supplements

According to Gerald and Dorothy (2014), under the 1994 Dietary Supplement Health and Education Act (DSHEA), manufacturers, not the FDA certify that a product is safe. A health hazard has to occur in order for the FDA to interfere (Gerald & Dorothy, 2014). Even though a health hazard may be present it can still take months or up to years for the product to be removed from the store (Gerald & Dorothy, 2014). In other words Gerald and Dorothy (2014) expressed that because of this act it is the firm that regulates whether or not the product is safe instead of the FDA, meaning that anything the firm potentially views as “safe” goes on the shelf for the world to buy. While Froiland et al. (2004) found the use of supplements to be high, keeping these products on the shelf without the regulation of the FDA can be potentially harmful when people are unaware of what is in a particular dietary supplement (Gerald & Dorothy, 2014) Because of this precaution for supplement use, the researchers emphasized that being unaware of what is in a supplement can be dangerous when people combine the supplements with each other or with

prescriptions they are taking. The combination of dietary supplements or a supplement with a prescription can potentially lead to a toxicity overdose in the body or even a fatality (Gerald & Dorothy, 2014). For example, according to Gerald and Dorothy (2014), research found that some dietary supplements were linked to almost 20% of the most serious liver injuries in 2012. In addition to serious liver damage, another concern supplements have for users is the onset of headaches or migraines (Gerald & Dorothy, 2014). In a 2005 National Health Interview survey of 15,414 participants, the researchers looked at the difference between males and females in what dietary supplements cause headaches or migraines to occur. They found that in males the use of isoflavones has associated with a higher ratio of headaches or migraines, and in females the use of vitamin B complex, vitamin C, and green algae supplements has associated with higher likelihoods of headaches or migraines (Chiu et al., 2013).

In the athletic world, Outram and Stewart (2015) stated that athletes often strive to do anything to get ahead. Outram and Stewart (2015) claimed that striving to do anything to get ahead can lead to purposeful or accidental doping of supplements. It is shown that 40-70% of athletes use nutritional supplements (Outram & Stewart, 2015, p. 54). The high percentages of athletes taking supplements can be a problem when there are many supplements labeled incorrectly or spiked with banned substances (Outram & Stewart, 2015). One study by Geyer et al. (2008) examined 634 supplements and found that around 15% of the supplements were contaminated with anabolic-androgenic steroids. The high rate of supplement use among athletes in addition to the contamination of supplements has led to numerous problems with athletes testing positive for doping through the use of supplements (Outram & Stewart, 2015).

Another population of concern found by Dolan and Gatch (2015) is the US military. A particular concern was with the use of dimethylamylamine (DMMA). DMMA has been found in

supplements such as Jack3d, OxyELITE pro, and hydroxystim (Dolan & Gatch, 2015). Many side effects have been associated with DMMA (Dolan & Gatch, 2015). Some common side effects include nausea, myocardial infarction, tachycardia, headache, tremor, dizziness and death (Dolan & Gatch, 2015). This drug has been found to have methamphetamine and cocaine-like effects and have been highly cautioned against to prevent drug abuse which has led both the WADA and the military to ban its use, as well as the 2013 decision by the FDA to ban its use as an ingredient in dietary supplements (Dolan & Gatch, 2015).

Summary

With the risks of dietary supplements being so high, the question that is misused is why people make the nutritional lifestyle choices they do? It is important in research to know that individuals have different ideas of what an “ideal” body image is based upon their gender, ethnicity and sexual orientation. In addition to differences in body ideals between individuals, motivation is also highly idiosyncratic, impacting people’s fitness routines for different reasons. Previous research reveals that losing weight, gaining muscle mass, and overall health and wellness are common motives.

The main purpose of this study was to see if people who exercise for the reasons listed above had differences in their exercise motivations, their social physique anxiety, and their body image self-perceptions. A secondary purpose was to explore whether the participants’ supplement use reflects their stated exercise priorities and their scores on the psychological questionnaires.

It is hypothesized that those who are striving to lose weight or gain muscle mass will be less autonomously motivated, whereas those who are exercising to maintain or improve their overall health and wellness will be more autonomously motivated.

In general, the aim of this study was to add to the knowledge of what motivates college students to exercise, so as to better understand how to educate and promote physical activity among the college students population.

METHOD

Participants

The main purpose of this study was to see if people who exercise to either control or lose fat, gain or maintain muscle mass, or for health and wellness reasons, will have differences in their exercise motivations, their social physique anxiety, and their body image self-perceptions. A secondary purpose was to explore whether the participants' supplement use reflected their stated exercise priorities.

A total of 216 individuals who were currently exercising volunteered for this study. All participants were affiliated with the University of North Dakota. Student volunteers were recruited from University Kinesiology BIP classes and from the University Wellness Center. All participants were informed as to the general purpose of the study.

Instrumentation

Each participant completed a packet of questionnaires. Preliminary questions were specifically written to ask participants to specify their predominant reason for exercising (from three choices), and asked about their dietary supplement use. The rest of the packet was comprised of three different questionnaires: The Social Physique Anxiety Scale (SPAS) -- Hart, Leary, & Rejeski, 1989); the Behavioral Regulation of Exercise Questionnaire (BREQ-3) -- Markland and Tobin, 2004, Wilson et al., 2006), and the short form of the Multidimensional Body-Self Relations Questionnaire (MBSRQ – Cash, 2000).

Dietary Supplement Questionnaire

The items, written by the investigator, asked for details of any supplement use, and the reasons for why they were used. Preliminary questions also asked for descriptive data such as name, age, weight, height, sex, as well as asking about the primary reason for exercise, followed by the participants' listing what supplements they used and why.

Social Physique Anxiety Scale

The Social Physique Anxiety Scale (SPAS) is a twelve-item questionnaire related to the social anxiety people feel about their physique. Responses to the questions are marked using a five point Likert-type scale ranging from “not at all characteristic of me” to “extremely characteristic of me.” Overall SPAS scores were reported as the mean of the 12 items. Evidence of reliability (scale alpha of .90) and validity has been reported by the scale designers (Hart, Leary, & Rejeski, 1989).

BREQ-3

The BREQ-3 is a 24-item questionnaire designed to tap participants' motivation to exercise. Responses to the questions are marked using a five point Likert-type scale ranging from “not true for me” to “very true for me.” The instrument has six subscales, and scores are usually reported as the mean item score for each subscale. This questionnaire demonstrated alpha values of .83 for intrinsic motivation, .89 for integrated regulation, .77 for identified regulation, .71 for introjected regulation, .77 for external regulation, and .74 for amotivation (Sicilia, Saenz-Alvarez, Gonzalez-Cutre, Ferriz, 2008).

Multidimensional Body-Self Relations Questionnaire

The MBSRQ is a sixty-nine item questionnaire used to assess ten subscales of body image. The ten subscales include: appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, health evaluation, health orientation, illness orientation, body areas satisfaction, overweight preoccupation, and self-classified weights. Responses to all items are measured on a five point Likert-type scale, scores are usually reported as the mean of the items in each scale. Verbal anchors for items one to fifty-seven range from definitely disagree (1) to definitely agree (5). Verbal anchors for item numbered fifty-eight range from never (1) to very often (5). Verbal anchors to items numbered fifty-nine and sixty range from very underweight (1) to very overweight (5). Cash (2000) demonstrate adequate reliability statistics (e.g., alpha coefficients from .7 to .94) and document evidence of validity.

Procedures

Participants were recruited from University Kinesiology BIP classes, and from UND Wellness Center members. Although a convenience sample, the participants are likely to be representative of typical college exercisers. The general purpose of the study was explained, and the participants were informed that participation in the study was confidential and that they had the right to decline the study at any time. The informed consent was signed before any further participation.

The primary investigator explained the instructions to each questionnaire. Upon completion of the questionnaire the informed consent form as well as the questionnaires were collected.

Design and Analysis

The quasi-experimental study utilized a convenience sample to test the hypothesis that college student exercisers have different psychological reasons for exercising. Standard statistics (e.g. mean, and standard deviations) were used to describe the main characteristics and data of the sample. To answer the main question of this study – whether different reasons for exercising are associated with the different psychological factors – MANOVA was used to test for group differences on the dependent variables. Simple qualitative matching of the participants' reasons for exercising and their reasons for dietary supplement use were used to explore the secondary question of the study.

RESULTS

The main purpose of this study was to see if people who exercise for health, to lose fat, or to gain or maintain muscle had differences in their exercise motivations, their social physique anxiety, and their body image self-perceptions. A secondary purpose was to explore whether the participants' supplement use reflects their stated exercise priorities.

A total of 216 exercisers (87 male; 129 female) completed questionnaires, but 15 of them checked more than one of the primary reasons-for-exercise options on the questionnaire, and thus, could not be included in the main analyses. Also, another 15 checked "Other" as an option, and of those, only one wrote in a reason (train for athletics). Thus, a total of 186 participants were left for inclusion in the main (group-based) analyses.

The issue of missing data was only a minor problem. Specifically, the only missing data were six unscored items from the BREQ-3 scales. In each case only one item was unscored for a subscale, and the mean of the other items in that subscale was inserted.

The descriptive statistics and scale intercorrelations are presented below in Tables 1 and 2:

Table 1. Descriptive statistics

Table 1: Descriptive statistics									
	Overall health			Health & Wellness		Muscle		Fat loss	
	Mean	SD	Alpha	Mean	SD	Mean	SD	Mean	SD
AGE	20.18	2.29		19.13	1.51	20.34	2.56	20.57	1
WEIGHT	160.84	39.44		156.27	55.30	154.51	34.55	171.51	34.56
HEIGHT	68.05	3.90		66.33	3.46	67.63	3.70	70.09	3.73
SPAS	2.81	.82	.90	2.89	.64	2.66	.75	2.72	.82
AMOTIVATION	.30	.54	.83	.02	.06	.34	.58	.19	.42
EXTERNAL REG.	.80	.84	.84	.93	1.06	.75	.82	.84	.80
INTROJECTED REG.	2.27	1.10	.87	2.55	.89	2.00	.97	2.81	1.01
IDENTIFIED REG.	3.03	.84	.80	3.03	.69	2.96	.82	3.51	.60
INTEGRATED REG	2.45	1.20	.93	2.38	1.16	2.27	1.11	3.40	.95
INTRINSIC MOT.	2.89	.90	.91	3.15	.67	2.80	.85	3.50	.74
RAI	11.83	6.4		12.78	5.12	11.38	5.97	15.66	5.42
APPEAR EVAL.	3.50	.78	.89	3.68	.59	3.60	.73	3.60	.67
APPEAR ORIENT.	3.42	.70	.85	3.34	.79	3.40	.67	3.43	.59
BODY AREAS SAT.	3.45	.70	.82	3.46	.62	3.56	.61	3.49	.66
OVERWT PREOCC	2.44	.90	.76	2.70	1.05	2.30	.79	2.19	.75
SELF WT. CLASS.	3.15	.62	.87	2.97	.64	3.10	.56	3.01	.40

Key: SPAS; Social Physique Anxiety Questionnaire, External Regulation, Introjected Regulation, Identified Regulation, Integrated Regulation, Intrinsic Motivation, RAI; Relative Autonomy Index, Appearance Evaluation, Appearance Orientation, Body Area Satisfaction, Overweight Preoccupation, Self Weight Classification.

Table 2. Scale Intercorrelations

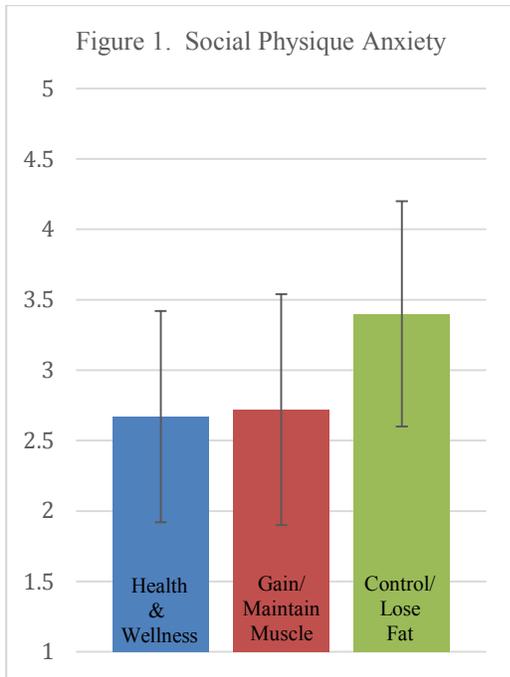
Table 2: Intercorrelation between variables													
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SPAS		0.09	.21**	.19**	-0.04	-0.10	-0.23**	-.25**	-.72**	.35**	-.70**	.61**	.45**
2. AMOT			.22**	-.28**	-.52**	-.40**	-.49**	-.70	-.17	-.04	-.19**	-.01	.13
3. EXREG				.18**	.02	.00	-.14*	-.41**	-.13	.19**	-.27**	.25**	.24**
4. INTROJECTD					.67	.61**	.46**	.37**	-.10	.34**	-.15*	.38**	.07
5. IDENT						.82**	.70**	.75**	.16*	.19**	.11	.15*	-.06
6. INTEGRATED							.76**	.81**	.23**	.17*	.18**	.13	-.15*
7. INTRINSIC								.89**	.28**	.08	.26**	.04	-.20**
8. RAI									.32**	.03	.34	-.05	-.26**
9. APPEVAL										-.14*	.74**	-.41**	-.50**
10. APPORIENT											-.34**	.50**	.05
11. BAREASAT												-.47**	-.38**
12. OWTPREOCC													-.38**
13. SELFWTCL													

Included in Table 1 are the scale (Cronbach's) alphas for the Behavioral Reasons for Exercise Questionnaire (BREQ-3), Social Physique Anxiety Scale (SPAS), and Multidimensional Body-Self Relations Questionnaire (MBSRQ) scales. All scales demonstrated good internal reliability.

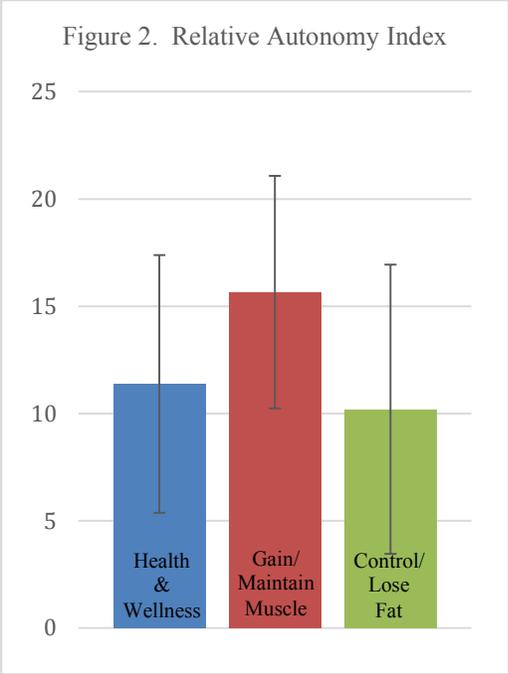
The intercorrelations between the BREQ-3 scales showed the typical and expected simplex pattern of correlations that supports the internal versus external control continuum of the exercise motivation construct measured by the questionnaire. For the sake of subsequent analyses, and to increase the participants-to-variables ratio, a Relative Autonomy Index (RAI) was computed from the BREQ-3 subscales ($RAI = [AMOT \times -3] + [EXREG \times -2] + [INTROJ \times -1] + [IDENT \times 1] + [INTREGR \times 2] + [INTRIN \times 3]$).

Group differences

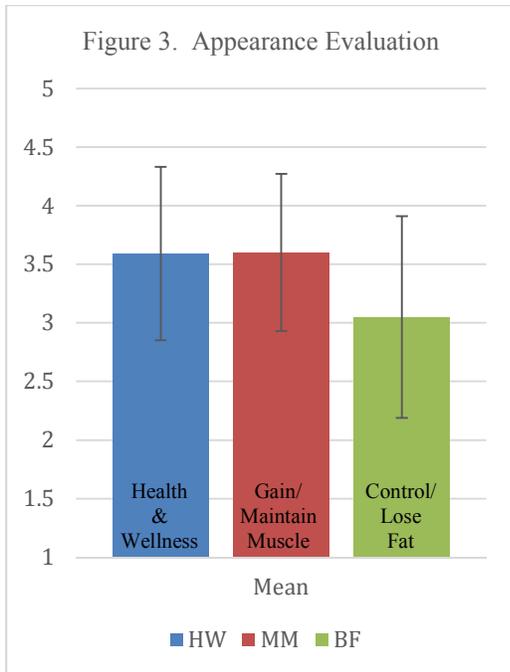
A oneway MANOVA was computed to see if the three different reasons-for-exercise groups differed on the SPAS, RAI, and MBSRQ scales dependent variables. There was a significant difference between groups (Wilks' lambda = .70, $F(14, 350) = 4.89$, $p < .001$). Post hoc tests showed significant differences between groups on six out of the seven dependent variable scales. These differences are presented in the form of bar graphs below (see Figures 1-7).



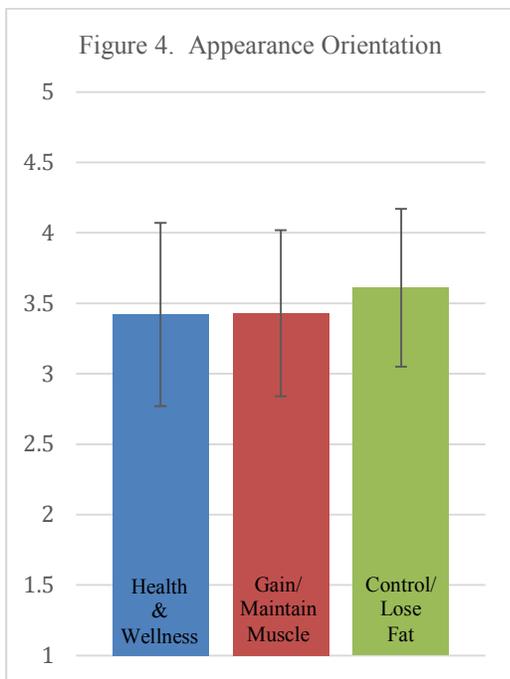
The participants whose primary reason for exercising was to lose fat, or to keep body fatness low, scored significantly higher ($p < .001$) on the Social Physique Anxiety scale than those whose primary reasons were for general health or wellness, or to gain or maintain muscle mass.



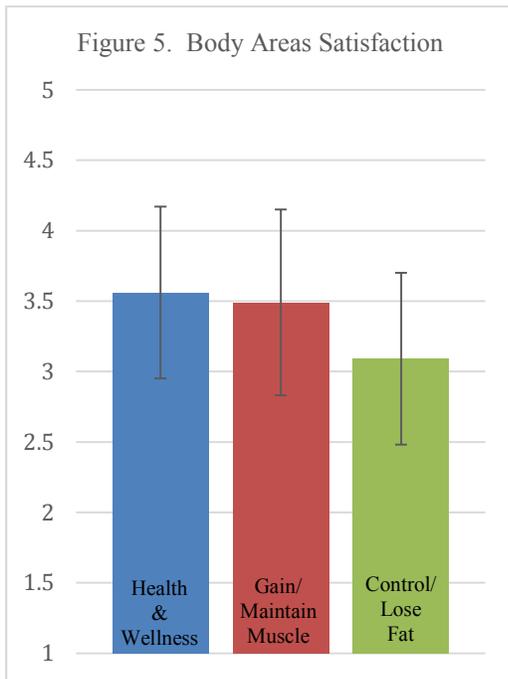
The participants whose primary reason for exercising was to gain or maintain muscle, scored significantly higher ($p < .001$) on the Relative Autonomy Index than those whose primary reasons were for general health or wellness, mass to lose fat, or to keep body fatness low.



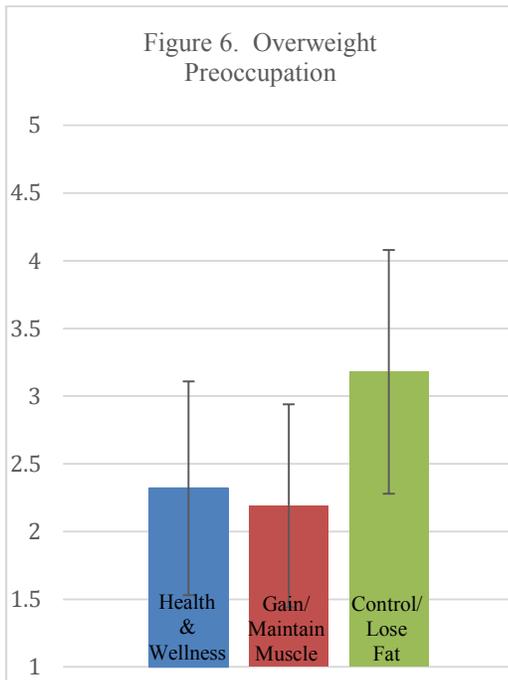
The participants whose primary reason for exercising was to control or lose body fat scored significantly lower on appearance evaluation than those whose primary reasons were to gain or maintain muscle ($p < .005$) or for general health or wellness ($p < .001$).



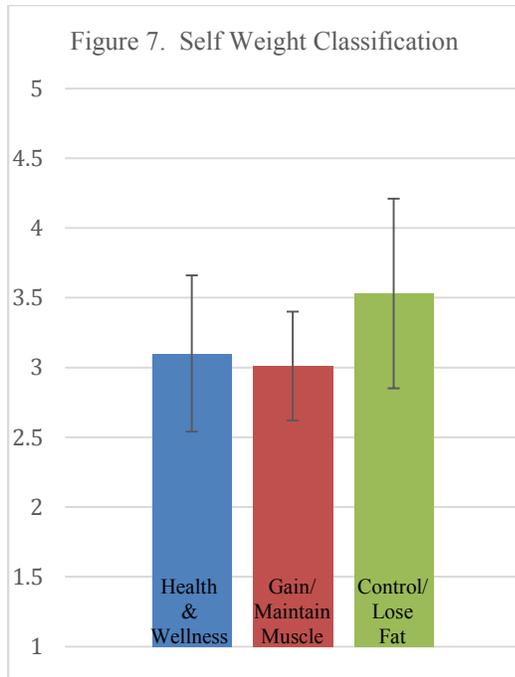
There was no significant difference between mean scores on appearance orientation between those whose primary reasons for exercising were health and wellness, to gain or maintain muscle mass, or to control/lose body fatness.



The participants whose primary reason for exercising was to control or lose body fat, scored significantly lower on the Body Area Satisfaction scale than those whose primary reasons were for general health or wellness ($p < .001$), or to gain/maintain muscle ($p < .01$).



The participants whose primary reason for exercising was to control or lose body fat, scored significantly higher ($p < .001$) on the Body Area Satisfaction scale than those whose primary reasons for exercising were for general health or wellness, or to gain/maintain muscle mass.



The participants whose primary reason for exercising was to control or lose body fat, scored significantly higher ($p < .001$) on the Self Weight Classification scale than those whose primary reasons were for general health or wellness, or to gain or maintain muscle mass.

Supplement use

The use of supplements ingested varied amongst college students and groups. Supplement use was low in the groups whose primary reasons for exercise was fat loss (10.9%), or wellness (15%), but quite high in the group whose primary reason for exercise was muscle gain (49.6%). The names and claims for the supplements ranged from a simple vitamin and mineral additive in their diet to a large percentage claiming to help build muscle mass or to increase energy. It is outlined below by group the names and claims of each supplement reported.

Table 3. Dietary Supplement use.

Participants who exercise for general health and wellness	
Name	Claim
Biotin	Hair/nail growth
Sinoplex	Decongestant
Caffeine pills	Energy
Iron	Helps with being anemic
Gold Standard Whey	Supplement protein intake
XS Whey Protein	Help grow the muscle and maintain pump
XS Pre-workout	Help give energy
Vibe by Eniva	Daily Multi-vitamin
General daily vitamin	
Isagenix shakes	Supply nutrition needed in a meal/day without artificial/processed food
Isagenix snacks	Curb hunger midway through meals and add nutrition
Creatine Monohydrate	Energy
VITE	Helps support brain
Shakeology	Contribute to health vitamin dose
Nature made daily multi	Multi-vitamin to support nutrition
Participants who exercise to gain or maintain muscle mass	
Name	Claim
Nitrostex	Energy booster
Herbalife	Changes cravings
Protein whey powder	Gain muscle mass
Daily Multi-vitamin	Higher health and wellness
Pre-workout with caffeine and BCAA's	Increase energy during workout
Vitafusion Multivitamin	Essential daily formula, gluten free
Six star pro nutrition elite series creatine x3 2.54 fruit punch	Engineered for rapid and dramatic muscle growth
Whey Protein	Protein supplement. Quick calories
Whey Protein	Pre-workout
Muscle milk protein powder	Whey protein helps with recovery and rebuild
Optimum nutrition gold standard whey	Building lean muscle mass
Muscle milk whey protein powder	To help build muscle
Whey protein	Supplement daily protein intakes
Creatine Monohydrate	Replenish creatine phosphate levels in muscles
Nitrate/Caffeine Pre-workout	Help induce blood flow and increase stimulation for workout
Creatine Monohydrate	Increase muscle ATP
Whey Protein	Builds muscle
Multi-vitamin	
Performics Ion with HLL creatine	Performics: Preworkout, caffeine and BCAA for energy HCL: increase creatine for performance and strength
Whey isolate by ON	Isolates source of protein

V-Core whey protein	Build and Repair muscle
Whey Protein	Help aid in recovery and boost muscle size
Protein	Muscle stiffness and muscle gain
BCAA's	Muscle recovery
Creatine, Whey, Glutamine	Retains water, promoted fast recovery, protein, helps muscles heal, glutamine, good for joints
BSN Suntha-6	To create and maintain muscle

Participants who exercise keep body fatness low

Name	Claim
Multivitamin	General health
Biotin	Hair skin and nail improvement
Protein Powder 25g protein	
Herbalife	Weight management
GNC Pro Performance "Ripped"	Thermogenic burn to help weight loss
C-4	Pre-workout
Vitamin D	Improves bodily function
Generic vitamin for women	All vitamins for daily need
Protein	Helps build lean muscle mass
Calcium supplement	
Guest protein powder	
Omeprazole	intestinal reflux

Participants who exercise for other reasons

Name	Claim
Biosteel	Recovery
Vega protein powder	
Probiotic	"Healthy Gut" stomach bloating
Daily vitamin	Keep up with my need for vitamins daily

DISCUSSION

The main purpose of this study was to see if people who exercise for general health, to lose fat, or to gain or maintain muscle, had differences in their exercise motivations, their social physique anxiety, and their body image self-perceptions. A secondary purpose was to explore whether the participants' supplement use reflects their stated exercise priorities and their scores on the psychological questionnaires.

All three main categories, (health and wellness, lose fat, and maintain or gain muscle mass), were shown to be autonomously motivated. It was hypothesized at the beginning of the study that the people exercising to gain or maintain muscle mass would be less autonomously motivated, however the results show that hypothesis to be false. The group labeled to maintain or gain muscle was actually the most autonomously motivated while the group to lose fat was shown to be the least autonomously motivated out of the three main groups. The reason the group who exercised to lose fat were the least autonomously motivated could be from the results indicated in our questionnaires of having a general poorer body self-perception (Perloff, 2014).

Past research indicated from Perloff (2014) stated that women who had lower self-esteem and were consistently striving for the perfect body were more susceptible to and influenced by media images of a thin idea. Our results in this study were consistent with that statement because the participants who checked primary reason for exercise, to lose or control fat, had less

positive scores on the RAI compared to those who participated for health, or for general muscle gains.

Farquhar & Wasyliw (2007) stated that men tend to strive for a body ideal of more muscular with a very low body fat percentage. Our results supported that premise with a majority of the men stating that their reason for exercise was to gain or maintain muscle mass. One conclusion to the reason for a man's primary attempt to gain or maintain muscle mass could be due to the fact of the increased pressure of how a man is supposed to look based upon current media trends (Farquhar & Wasyliw, 2007).

It was also of interest to look at dietary supplements and what group membership category tended to ingest the most supplements. Our results showed the most common users of dietary supplements were the people striving to gain or maintain muscle mass (49.6% of group). Fat loss and control followed (15% of group), and lastly, people that exercised for general health reasons (10.9% of group). Past research by Froiland, Koszewski, HIngst & Kepecky (2004) was consistent with our results. Also of interest were the types of supplements used and for what reasons. Froiland et al (2004), stated that most females took a supplement for health or because of inadequate diet while most males took a supplement for speed, agility, strength, power, or muscle/weight gain. Our results showed similar results in that most women that were taking supplements took a simple vitamin to help with their diets, while almost all the men's reasons were to help them gain or maintain muscle mass. However, one concern that arose was the efficacy and safety of supplements. Outram & Steward (2015) stated that most supplements are labeled incorrectly or spiked with a banned substance. Our results indicated questionable supplements names and claims, and is of interest to look further into to see if what these supplements claim to do or support are accurate and safe. A few examples of supplements that

raised some questions were Isogenix snacks which claimed to help curb appetite, Nitrostex which claimed to help dilate blood vessels, and Biosteel claiming to help build lean muscle. Deldicque L. et al (2016) backs up the need to look further into the safety of supplements based upon his research that 90% of sports supplements contained traces of drugs that put people at higher risk of harming their bodies.

Limitations

There were some limitations to this study. Notably, the lack of large numbers in each of the categories. Another limitation could be the lack of gender specifics for each category (because the low and unbalanced numbers precluded by-sex analyses).

Strengths

A strength of this study was the use of both quantitative and qualitative methods to obtain data on the differences between people who exercise for different purposes.

Future Research

More research needs to be done in the area of dietary supplements, especially in terms of comparing the marketing claims with the actual effects of these products. Better knowledge from such studies could help educate consumers, and better enable them to make more objective cost-benefit analyses before deciding whether to purchase, and use supplements.

Conclusions

In conclusion, the statistical analyses revealed significant differences between groups on six out of seven dependent variable scales. Specifically, the group to gain or maintain muscle was significantly higher in autonomous motivation than fat control or general health, but fat control scores on SPAS, appearance evaluation, body areas satisfaction, overweight preoccupation, and self-weight classification were all less positive than the scores of gaining or maintaining muscle and general health. Supplement use was low in general health (11%), fat loss or control (15%), but higher in to gain or maintain muscle (49%).

The majority of these college student exercisers were autonomously motivated, but those who exercised primarily for fat control had more negative body-related perceptions than those who exercised primarily for health, or for muscle gain reasons. Additionally, the data on supplement use indicates a need for consumer education, especially for those who report they are exercising primarily to gain muscle.

APPENDIX

Exercise and Dietary Supplement Questionnaire

Age _____

Male / Female (circle one)

Height _____

Weight _____

Check ONE of the options below that describes the PRIMARY reason that you are exercising?

- For general *health* and *wellness*
- To gain or maintain *muscle* mass
- To lose *fat*, or to keep body fatness low
- Other

Do you use any dietary supplements?

No Yes

If "yes" write in name of supplement and describe what it claims to be for:

Supplement Name: _____

Supplement claim(s): _____

Supplement Name: _____

Supplement claim(s): _____

Supplement Name: _____

Supplement claim(s): _____

Social Physique Anxiety Scale (Hart, Leary, & Rejeski, 1989)

The following questionnaire contains statements concerning your body physique or figure. By physique or figure we mean your body's form and structure; specifically, body fat, muscular tone, and general body proportions.

Instructions: Read each item carefully and indicate how characteristic it is of you according to the following scale.

- 1 = Not at all characteristic of me
- 2 = Slightly characteristic of me
- 3 = Moderately characteristic of me 4 = Very characteristic of me
- 5 = Extremely characteristic of me

1. I am comfortable with the appearance of my physique or figure.
2. I would never worry about wearing clothes that might make me look too thin or overweight.
3. I wish I wasn't so up-tight about my physique or figure.
4. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.
5. When I look in the mirror I feel good about my physique or figure.
6. Unattractive features of my physique or figure make me nervous in certain social settings.
7. In the presence of others, I feel apprehensive about my physique or figure.
8. I am comfortable with how fit my body appears to others.
9. It would make me uncomfortable to know others were evaluating my physique or figure.
10. When it comes to displaying my physique or figure to others, I am a shy person.
11. I usually feel relaxed when it's obvious that others are looking at my physique or figure.
12. When in a bathing suit, I often feel nervous about how well proportioned my body is.

EXERCISE REGULATIONS QUESTIONNAIRE (BREQ-3)

Age: _____ years Sex: male female (please circle)

WHY DO YOU ENGAGE IN EXERCISE?

We are interested in the reasons underlying peoples' decisions to engage or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.

1. It's important to me to exercise regularly
2. I don't see why I should have to exercise
3. I exercise because it's fun
4. I feel guilty when I don't exercise
5. I exercise because it is consistent with my life goals
6. I exercise because other people say I should
7. I value the benefits of exercise
8. I can't see why I should bother exercising
9. I enjoy my exercise sessions
10. I feel ashamed when I miss an exercise session
11. I consider exercise part of my identity
12. I take part in exercise because my friends/family/partner say I should
13. I think it is important to make the effort to exercise regularly
14. I don't see the point in exercising
15. I find exercise a pleasurable activity
16. I feel like a failure when I haven't exercised in a while
17. I consider exercise a fundamental part of who I am
18. I exercise because others will not be pleased with me if I don't
19. I get restless if I don't exercise regularly
20. I think exercising is a waste of time
21. I get pleasure and satisfaction from participating in exercise
22. I would feel bad about myself if I was not making time to exercise
23. I consider exercise consistent with my values
24. I feel under pressure from my friends/family to exercise

THE MBSRQ-AS INSTRUCTIONS--PLEASE READ CAREFULLY

The following pages contain a series of statements about how people might think, feel, or behave. You are asked to indicate the extent to which each statement pertains to you personally. Your answers to the items in the questionnaire are anonymous, so please do not write your name on any of the materials. In order to complete the questionnaire, read each statement carefully and decide how much it pertains to you personally. Using a scale like the one below, indicate your answer by entering it to the left of the number of the statement.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items. (Duplication and use of the MBSRQ-AS only by permission of Thomas F. Cash, Ph.D., Department of Psychology, Old Dominion University, Norfolk, VA 23529)

EXAMPLE:

_____ I am usually in a good mood.

In the blank space, enter a 1 if you definitely disagree with the statement; enter a 2 if you mostly disagree; enter a 3 if you neither agree nor disagree; enter a 4 if you mostly agree; or enter a 5 if you definitely agree with the statement.

- _____ 1. Before going out in public, I always notice how I look.
- _____ 2. I am careful to buy clothes that will make me look my best.
- _____ 3. My body is sexually appealing.
- _____ 4. I constantly worry about being or becoming fat.
- _____ 5. I like my looks just the way they are.
- _____ 6. I check my appearance in a mirror whenever I can.
- _____ 7. Before going out, I usually spend a lot of time getting ready.
- _____ 8. I am very conscious of even small changes in my weight.
- _____ 9. Most people would consider me good-looking.
- _____ 10. It is important that I always look good.
- _____ 11. I use very few grooming products.
- _____ 12. I like the way I look without my clothes on.
- _____ 13. I am self-conscious if my grooming isn't right.
- _____ 14. I usually wear whatever is handy without caring how it looks.
- _____ 15. I like the way my clothes fit me.
- _____ 16. I don't care what people think about my appearance.
- _____ 17. I take special care with my hair grooming.
- _____ 18. I dislike my physique.
- _____ 19. I am physically unattractive.
- _____ 20. I never think about my appearance.
- _____ 21. I am always trying to improve my physical appearance.
- _____ 22. I am on a weight-loss diet.
- _____ 23. I have tried to lose weight by fasting or going on crash diets.

- _____ 24. I think I am
- _____ 25. From looking at me, most other people would think I am
- _____ 26. Face (facial features, complexion)
- _____ 27. Hair (color, thickness, texture)
- _____ 28. Lower torso (buttocks, hips, thighs, legs)
- _____ 29. Mid torso (waist, stomach)
- _____ 30. Upper torso (chest or breasts, shoulders, arms)
- _____ 31. Muscle tone
- _____ 32. Weight
- _____ 33. Height
- _____ 34. Overall appearance

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