WOMEN AND STRENGTH TRAINING

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ABSTRACT OF THE THESIS

Women and Strength Training
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Strength training is a form of physical activity shown to provide numerous benefits, and is recommended for all adults in addition to aerobic exercise. Participation rates are low, especially with adult women. Group fitness classes may be a valuable resource for women to undertake strength training. An encouraging, knowledgeable instructor and supportive peers can facilitate skill development and internalizing values.

The current study examined factors associated with women who routinely strength train. Quantitative and qualitative data was collected from women who had exercised in a group fitness setting for at least six months and were either strength training or aerobic participants. Strength training group fitness instructors were interviewed to determine correspondence to group fitness participant perceptions.

Statistical analyses demonstrated significant differences in muscular development and weight management motives, and strength and aerobic activity knowledge between women who do and do not strength train. Among all women who reported using more strategies to maintain their exercise behavior, more self-determined behavioral regulation and stronger motivation for muscle development were observed.

The overarching concept of trust emerged from the qualitative data. Women who strength trained described trust in their instructor and the group fitness setting, as well as trust in their body’s capabilities and capacity for strength. Both groups of women described concurrent internal and external motivating factors for exercise.

The focus of this study was on strength training; however, insight from women who have successfully adopted and maintained any exercise habit can be valuable for any effort designed to encourage women to initiate physical activity behaviors.
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CHAPTER 1

INTRODUCTION

This chapter presents the background, purpose, and significance for the current study.

BACKGROUND

Strength training (ST) provides a number of substantial health and quality of life benefits. Clinical and community-based strength training interventions conducted with groups spanning a wide range of age, gender and physical conditions have demonstrated improvements in areas such as musculoskeletal status, cellular aging, energy metabolism, sleep quality, pain management, weight control, select indicators of cognitive functioning, and psychological health (Hurley, Hanson, & Sheaff, 2011; Melov, Tarnopolsky, Beckman, Felkey, & Hubbard, 2007; Schmitz et al., 2007). Evidence supporting the role adequate muscle mass and strength play in chronic disease prevention and symptom reduction has accrued significantly in recent years (Terre, 2010; Hurley et al., 2011). ST not only increases muscle strength and endurance, but it also enhances the cardiovascular system, increases flexibility, and is an important component of fitness for persons of all ages and genders (Garber et al., 2011).

Healthy People (HP), the consortium responsible for outlining the national health agenda in 10-year increments, has identified ST as an indicator for improvement in physical activity measures (U. S. Department of Health & Human Services [USDHHS], 2011). The current initiative, HP 2020, seeks to increase the number of adults performing muscle-strengthening activities on two or more days of the week by ten percent, from the 2008 baseline of 21.9%, to a 24.1% goal (USDHHS, 2011).

ST, also known as resistance or weight training, includes a variety of activities designed to enhance muscle strength and size (Garber et al., 2011). The development of muscle strength and endurance is progressive over time. Increases in the amount of weight or resistance used or the number of days an individual exercises will strengthen muscles (Ratamess et al., 2009). The use of handheld weights, weight machines, body weight,
resistance tubing, and certain work-related and other activities, such as heavy lifting and gardening, are several methods of ST (USDHHS, 2008).

The 2008 Physical Activity Guidelines for Americans advise adults to engage in moderate or high intensity muscle-strengthening activities that include all major muscle groups (extremities, hips, back, chest, abdomen, and shoulders) at least two days a week; this is in addition to the weekly minimum of 150 minutes moderate-intensity, or 75 minutes of vigorous-intensity aerobic activities (USDHHS, 2008). ST guidelines do not ordinarily include a specific time length for discrete ST episodes. The minimum recommendation consists of performing at least one set of 8–12 repetitions each of 6–10 exercises, targeting all major muscle groups, using enough weight or resistance to reach a perceived exertion level that would make completing one more repetition difficult by the end the set (Garber et al., 2011; Haskell et al., 2007).

**STATEMENT OF THE PROBLEM**

Despite the numerous preventive and restorative benefits ST offers, the majority of Americans do not participate in regular, on-going strength building activities. The Centers for Disease Control and Prevention (2006) reported that for the period 1998 – 2004, the prevalence of all adults who strength trained increased from 17.7% to 19.6%, and significant increases in the number of non-Hispanic white women who reported ST were noted, but the age-adjusted rate for all adult women during that period was 17.5% (2006). Results from the 2008 National Health Interview Survey (NHIS), a cross-sectional household survey of a representative sample of the United States (U.S.) adult population over age 18 years, indicated that overall, 21.4% of U. S. adults reported engaging in strengthening activities two or more days a week (Health Indicators Warehouse, 2011). Distributed by gender, 25.7% of men ages 18 and older reported doing physical activities specifically designed to strengthen muscles at least twice per week, compared to just 18.3% of women aged 18 years and older (Health Indicators Warehouse, 2011). Demographic disparities are known to exist in relation to ST participation; women and older adults are less likely to engage in ST, and women 50 years old and older who do not engage in ST are also significantly more likely to be overweight or obese (Chevan, 2008; Kruger, Ham, & Prohaska, 2009).
GENDER CONSIDERATIONS

ST guidelines are not differentiated by gender (Haskell et al., 2007; Williams et al., 2007). The American Heart Association’s guidance on absolute and relative contraindications to ST does not identify any gender-specific contraindications (Williams et al., 2007). Women derive benefit from a fitness program that incorporates routine ST in the same manner as men. Women’s ST routines, exercises, and intensities should mirror that of men, with consideration of experience level and certain pre-existing conditions, such as cardiac disease, for both genders (Garber et al., 2011; Ratamess et al., 2009). Multiple randomized controlled clinical studies have demonstrated the general safety and effectiveness, as well as improved health outcomes of ST for men and women of all ages, regardless of prior fitness level (Fetherman, Hakim, & Sanko, 2011; Hurley et al., 2011; Nelson et al., 1994; Surakka, Alanen, Aunola, Karppi, & Lehto, 2004). Additionally, reports from ST interventions conducted with samples that included frail, unconditioned, and elderly participants showed positive physical and emotional results. These results lend further support to the position that ST is a safe and vital component of virtually every woman’s physical activity plan.

PURPOSE OF THE STUDY

The purposes of the current study were to: (1) explore adult (ages 30–59 years old) women’s knowledge, beliefs and attitudes regarding ST; (2) identify individual characteristics of women who routinely engage in ST and compare these attributes with women who do not; and (3) examine group fitness instructors’ experiences with and observations of the women they encounter while teaching group ST classes. This was accomplished through a qualitative and quantitative approach. This study adds to the literature on women and ST by examining the knowledge, beliefs, and attitudes of diverse community-living adult women toward ST, and exploring the role and potential influence of the group fitness instructor with regard to women’s participation in ST.

THEORETICAL BASES AND ORGANIZATION

Constructs from two theoretical frameworks informed the current study. Self-Determination Theory (SDT) has been applied to a variety of settings, such as education,
healthcare and work organizations, but is particularly appropriate to exercise and sport domains (Hagger & Chatzisarantis, 2007; Ryan & Deci, 2000a; Ryan, Williams, Patrick, & Deci, 2009). SDT addresses motivation, asserting that humans are naturally motivated to learn and grow, but simultaneously are subject to the influences of surrounding social forces and environmental factors (Ryan & Deci, 2000a). SDT encompasses individual variations in the type and quality of motivation, which are shaped by a combination of mindful and mindless behaviors and external social and physical situations (Deci & Ryan, 1980; Ryan & Deci, 2000b).

The Transtheoretical Model (TTM) originates from psychology as well and is a cyclical, five-stage behavior change framework; Prochaska and DiClemente (1982) built the TTM through an extensive analysis of 18 therapeutic counseling approaches. Both theories and their relevance to the current study are described in detail in this section.

**Self-Determination Theory (SDT)**

Deci and Ryan (1980) developed SDT from previous research on intrinsic and extrinsic motivation. Concepts from two ostensibly disparate perspectives, behavioral theories, which assert actions are performed reflexively, and humanistic psychology approaches, which consider behaviors to be under an individual’s deliberate, mindful control, are integrated in SDT (Deci & Ryan, 1980). Motivation is defined as the psychological powers that drive an individual toward goal achievement (Silva et al., 2008). Intrinsic motivation refers to behaviors and activities performed for the genuine pleasure of doing so; simply put, the endeavor is its own reward. Intrinsically motivated behaviors are within the individual’s complete control (Silva et al., 2008). Generally, behaviors that are performed to gain a positive outcome or avoid a negative one are considered extrinsically motivated (Ryan et al., 2009). Self-determined, or intrinsic, motivation is more likely to produce positive behavioral outcomes. Conversely, behavior low in self-determination, or behaviors that stem from more extrinsic motivating factors, are likely to result in a loss of interest or discontinuation of an activity or behavior (Ryan et al., 2009). Amotivation, or the absence of motivation, is characterized by either non-performance of a behavior, or meaningless performance of an activity (Ryan & Deci, 2000a).
Motivation to participate in physical activity is an important factor in determining why individuals do or do not engage in physical activity. SDT measures motivation on a continuum ranging from amotivation to intrinsic motivation, with four extrinsic motivational factors lying between the two anchors (Ryan & Deci, 2000a; Ryan et al., 2009).

At the far left end of the continuum is amotivation, which may be explained by a lack of competence, a lack of perceived value in the behavior, or a lack of desire to perform the behavior (Ryan et al., 2009). Extrinsic motivation is classified by degrees of behavioral regulation: external regulation, introjected regulation, identified regulation, and integrated regulation (Ryan & Deci, 2000a). External regulation, closest to a lack of motivation on the continuum, is defined by behaviors that are performed under the expectation or influence of rewards or threats from outside sources. Introjected regulation, next on the continuum, occurs when individuals perform a behavior to avoid negative feelings or gain approval from others. Behavior motivated by the value placed on the outcome, such as improved health, is identified regulation. Behaviors performed through identified regulation will continue in the absence of rewards (Ryan et al., 2009).

Closest to intrinsic motivation on the continuum is integrated regulation; at this stage, the individual participates in behaviors because the behavior aligns with their sense of self or identity (Ryan et al., 2009). Finally, intrinsic motivation is associated with behaviors performed for the sheer pleasure derived from the activity (Ryan & Deci, 2000a). Framing motivation within constructs of SDT can enhance understanding of the reasons for women’s participation in strength training activities, or lack thereof.

**Facilitating Motivation**

SDT posits that individuals have three basic needs for efficacious growth and function: competence, autonomy, and relatedness (Ryan & Deci, 2000b).

**Competence**

Competence refers to the personal belief that one is capable of carrying out behaviors and meeting goals (Silva et al., 2008). Competence encompasses individual attributes and skills, as well as larger social factors, such as supportive responses from others (Ryan et al., 2009). Internalizing behaviors and integrating them into one’s sense of self is facilitated by
increased competence; a behavior an individual is confident he or she can carry out is more apt to be adopted (Ryan & Deci, 2000b).

**Autonomy**

Although autonomy is considered an internal, self-regulated state, external social environmental factors exert tremendous influence on actual and perceived autonomy. Within the constructs of SDT, autonomy is not interrelated with individualism or independence; autonomy has actually been positively associated with relatedness and a sense of belonging (Ryan & Deci, 2000b). Additionally, the more in control, or autonomous, one feels, it is more likely the overall outcome of an activity will be positive (Ryan et al., 2009).

**Relatedness**

The third essential element for internalizing behaviors is relatedness (Ryan & Deci, 2000b). Relatedness is an individual’s perceived sense of belonging, inclusion, and being cared for by others specific to a designated behavior (Ryan & Deci, 2000b). Perceiving that others care and are interested can facilitate internalizing values and skills of the surrounding environment, such as those in a group fitness class (Ryan et al., 2009).

**Transtheoretical Model**

The Transtheoretical Model (TTM), also known as the Stages of Change, is an individual level model that emanated from psychotherapy, but has demonstrated relevance with a number of health related behaviors, including interventions designed to increase physical activity (Martin, Prayor-Patterson, Kratt, Kim, & Person, 2007; Pekmezi, Barbera, & Marcus, 2010). The TTM postulates that individuals cycle through a series of following stages while they are in the course of behavior change. The stages of change are identified as precontemplation, contemplation, preparation, action, and maintenance (Prochaska & DiClemente, 1982). The initial stages involve a progression from precontemplation, or unawareness that change is needed, to contemplation, which is signified by awareness of the need to change (Prochaska, Redding & Evers, 2008). The next stage, preparation, involves planning the elements required to execute the change. In the action phase, the behavior change has occurred, but for less than six months (Prochaska, et al., 2008). An individual is in the maintenance stage when the behavior change has been adopted for longer than six
months (Prochaska et al., 2008). There is potential for reverting to previous habits and re-entry in the cycle at any point is possible (Prochaska & DiClemente, 1982).

TTM constructs also include self-efficacy, temptations, decisional balance, and processes of change (Paxton et al., 2008). Self-efficacy refers to confidence in one’s ability to carry out a specific behavior despite obstacles. Temptations are in opposition to self-efficacy – the pull of the unhealthy behavior in the face of challenges (Prochaska et al., 2008). Decisional balance refers to weighing the pros and cons of the behavior change (Prochaska et al., 2008).

**Processes of Change**

The ten processes of change in the TTM describe how change occurs, and they are categorized as either cognitive or behavioral processes (Pekmezi et al., 2010). Cognitive processes include consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, and social liberation. Gathering information about a topic, such as strength training and other types of physical activity, is an example of consciousness raising. Dramatic relief entails expressing fears, concerns and other feelings regarding the topic at hand, as well as positive ways to address the topic. Appraising the impact of your behavior on others is environmental reevaluation, while self-reevaluation is considering the impact of a health behavior on one self (Pekmezi et al., 2010). Social liberation generally occurs when members of a particular group are afforded more opportunity because of environmental or social changes, such as when legislation prohibiting discrimination on basis on gender led to increased female participation in athletics (Prochaska & DiClemente, 1982).

The behavioral processes of change are as follows: counter-conditioning, helping relationships, reinforcement management, self-liberation, and stimulus control (Pekmezi et al., 2010). Counter-conditioning involves changing responses to stimuli, or substituting a healthier behavior for another, less healthy, one, such as engaging in physical activity when feeling bored or emotionally upset rather than eating (Pekmezi et al., 2010; Prochaska & DiClemente, 1982). Helping relationships are those that support positive change and are marked by caring, trust, acceptance, and honesty (Prochaska et al., 2008). Reinforcement management is related to rewards given to oneself or by others for engaging in a behavior. Self-liberation is the experience of being aware and responsible for making choices that
affect a behavior (Prochaska & DiClemente, 1982). Stimulus control refers to the strategies designed to ensure the desired behavior occurs, such as keeping a set of exercise clothes in the car at all times, to facilitate physical activity (Pekmezi et al., 2010). According to the TTM, the different processes are applied, in varying degrees, and at fluctuating times, during each stage of change (Pekmezi et al., 2010). Some processes, such as consciousness raising and dramatic relief, may be primarily utilized early stages of change, but all processes may be employed (and re-employed) throughout the cycle. For example, an individual in the maintenance phase of an activity such as ST may begin to work toward improving proficiency and expanding his or her repertoire of skills within the activity or behavior at hand. Seeking new information about ST techniques and verbalizing concerns about one’s ability to meet new ST goals are fitting examples of consciousness raising and dramatic relief.

Applying the TTM and SDT to ST

TTM and SDT constructs have been applied to numerous interventions to explain various aspects of physical activity behaviors and in interventions designed to increase physical activity (Dannecker, Hausenblas, Connaughton, & Lovins, 2003; Marshall & Biddle, 2001; Martin et al., 2007; Pekmezi et al., 2010; Silva et al., 2010). One study incorporated both theoretical frameworks; the relationship of self-determination across the stages of change in adults was evaluated in a cross-sectional study that integrated constructs of the TTM and SDT (Mullan, Markland, & Ingledew, 1997). Of the 314 men and women survey respondents, individuals who were determined to be in the later stages of the change process also ranked higher on self-determination and intrinsic motivation levels (Mullan et al., 1997).

Kathrins and Turbow (2010) applied SDT concepts in an on-line Internet survey of 185 adult fitness center participants to determine if individual characteristics and self-determination influenced levels (i.e., type, duration, and frequency) of resistance training. While demographics were not significant indicators of an individual’s ST level, an internal or external motivation orientation was significantly associated with higher levels of ST (Kathrins & Turbow, 2010). The current study surveyed participants’ with regard to the orientation of their motivation; it was anticipated that as long-term exercise adherents, the
participants would likely be closer to intrinsic motivation or extrinsically motivated by integrated regulation on the continuum.

Interventions specific to women participating in ST programs have applied the TTM (Fetherman et al., 2011). In a pilot study of older women enrolled in a 12 week ST program, the TTM constructs of self-efficacy, decisional balance, and stage of change for exercise were included; women randomized to the ST/behavior change (STBC) arm of the study received one individual counseling session based on the results of a nine question, open ended TTM processes of change goal setting worksheet they completed (Fetherman et al., 2011). While self-efficacy to exercise did not change overall, a significant change in the number of STBC participants were found to have progressed in their stage of exercise change versus women in the ST only (STO) arm. Another outcome was that the STBC group identified more pros to ST in decisional balance than the STO group (Fetherman et al., 2011).

With regard to the TTM, the current study was primarily concerned with the processes of change, as all group fitness participants were required to have been at least six months on-going, regular experience in either strength training or aerobic exercise in a group fitness setting. Therefore, the participants were already in the maintenance stage of the TTM stages of change. Exploring the processes of change may be of greater benefit in this sample.

Reinforcement management, helping relationships, counter-conditioning, and stimulus control are thought to mediate progression in the later stages of change (Prochaska & Prochaska, 2007). In the current study’s context of women and ST, reinforcement management refers to perceived rewards of exercise. The group fitness setting may engender helping relationships, as instructors and fellow students are in the position to support participants as they move toward sustained behavior change, in this situation, regular participation in ST activities. Counter-conditioning, or changing internal responses to stimuli, was defined the same in ST as in other forms of physical activity; for example, the decision to exercise rather than giving in to fatigue is a process all long term exercise adherents may engage in, regardless of activity type. Stimulus control, changing the environment, was considered in terms of all physical activities as well; having clothing and accessories available for ST is similar to planning for other exercise activities.

In the current study, the concepts of self-efficacy, reciprocal determinism, expectancies, reinforcers and barriers, observational learning, and behavioral capability as
applied to adult women and ST are considered. Self-efficacy is examined in the context of
certainty in one’s ability to strength train and with progressive increases in self-selected
training level of difficulty (i.e., increasing resistance or weight). The current study examines
the give-and-take between environmental factors and groups and individuals from the
framework of beliefs and attitudes toward women and ST. Outcome expectancies are viewed
in the sense of what women perceive to be the consequences of ST and increased
muscularity. Reinforcers and barriers are the facilitators and obstacles women perceive on
the way to meeting their ST goals. The role of the fitness instructor, and tangentially, other,
more experienced, participants, is a vital component of observational learning and may be
directly linked to behavioral capability with regard to the skills and techniques comprising
certain types of ST. The group fitness instructor not only models correct technique, he/she
may also verbally discuss benefits, proper technique, and other relevant concepts associated
with the topic.

**REVIEW OF THE LITERATURE**

Despite the numerous, proven benefits of ST, the majority of American women do
not participate in strength building activities (Haskell et al., 2007). This trend parallels an
overall lack of involvement in physical activity pursuits in women of all ages (Speck &
Harrell, 2003). Though studies have been conducted on variables associated with women’s
participation in physical activity, the majority focused on participation in aerobic events
(Caperchoine, Mummery, & Joyner, 2009; Eves, Hoppe, & McClaren, 2003; King et al.,
2000; Martin et al., 2007; Speck & Harrell, 2003). In these studies, psychological variables,
such as self-efficacy, and social environmental variables, such as social support and physical
environment, did not consistently predict participation in aerobic physical activities (Speck &
Harrell, 2003).

A group exercise format may provide women with an opportunity for obtaining
adequate levels of physical activity, including ST. Relatively few studies have examined
factors associated with adult women’s participation in ST in a group setting (O’Dougherty et
al., 2008; Surakka et al., 2004). Group ST typically involves several participants using free
weights, resistance tubing and bands, and body weight in sets choreographed by an
instructor, often accompanied by music. In a group setting, free weights may include hand-
held weights, weighted balls and bars (Kisner & Colby, 2007) This is in contrast to individual training in a gym or home setting with fixed equipment, weight machines, dumbbells, or barbells; individual ST situations are not an element of the current study.

ST as an individual training experience has been the topic of several exploratory studies (Brace-Govan, 2004; Dworkin, 2001, 2003). Dworkin (2001, 2003) employed ethnography in the form of participant-observation and conducted intensive individual interviews to develop detailed accounts of women’s experiences with weight training. In one study, 75% of the women (n = 33) interviewed reported that they either consciously avoided ST activities (10%), or exercised restraint (65%) if they did engage in ST activities (Dworkin, 2003). Restraint strategies, described by the women as “holding back,” “backing off,” and “lifting light,” consisted of using lighter weights than the woman was capable of lifting, decreasing time spent in ST, and/or decreasing the number of repetitions to prevent what the women perceived as unacceptable increases in muscle size (Dworkin, 2001, pp. 339, 342-343). In a smaller (n=11) study, Dworkin (2003) explored a similar phenomenon, the notable absence of women from the weight training room at a fitness center and the propensity to find more women using the center’s cardiovascular equipment instead. In both studies, approximately 93% of the 44 participants expressed a fear of becoming physically too large if their muscle size increased, a belief that a thin body type with minimal muscular definition is most desirable, and either stated or implied that aerobic exercise is superior to resistance training (Dworkin, 2001, 2003).

Brace-Govan (2004) interviewed 16 Australian women about their experiences as successful competitive weightlifters and explored concepts of social control in the field of female weightlifting. Competitive weightlifting is a sport that focuses on strength, not physique and muscular appearance (Brace-Govan, 2004). The young women unanimously described feeling a sense of mastery, competence, and autonomy, despite encountering numerous social barriers and negative reactions from others in the training setting, the community and within their social networks (Brace-Govan, 2004). Similarly, 21 female athletes who participated in focus groups that investigated the social contradictions between female muscular strength and cultural expectations of femininity at an American college expressed feelings of pride when discussing their individual physical strength (Krane, Choi, Baird, Aimar, & Kauer, 2004). In contrast to the Australian weightlifters, though, the fear of
becoming too muscular because of the training required for their respective sport emerged as a concern for the American women (Krane et al., 2004).

Of the few studies that have examined strength building from a group perspective, one reported that adult women who consistently engage in strength building activities in a group fitness setting reported higher perceived Health Related Quality of Life (HRQOL) (McGrath, O’Malley, & Hendrix, 2010). In a brief 12-week ST intervention with women over 55 years of age, no statistical change in HRQOL was observed (Fetherman et al., 2011). It is possible that the duration of the intervention was a factor in the results. Neither study reported on other variables, such as attributes of the group leader and characteristics of the group itself, which also may influence the participants’ experiences and perceptions (Burke, Carron, Eys, Ntoumanis, & Estabrooks, 2006; Fetherman et al., 2011; McGrath et al., 2010).

Societal Influences

Sociological and women’s studies perspectives have contributed to what is known about women’s experiences, perceptions, and attitudes toward increasing female muscular strength in general. Adhering to cultural and gender norms are the predominant concepts offered as influences on women and ST (Brace-Govan, 2004; Dworkin, 2001, 2003; Scott & Derry, 2005). Women have been socialized to avoid activities associated with strength and muscle building; it is considered culturally inappropriate for women to engage in physical activities that involve use of force and strength (Gill & Kamphoff, 2010; Scott & Derry, 2005). The social and cultural norms that inhibit women from participating in ST may be reflected in their statements that indicate a fear of “getting bulky” and a desire to “get toned” (Dworkin, 2003, pp. 142 – 143).

Knowledge and Beliefs

Knowledge deficits regarding the benefits of ST and misconceptions regarding the female body’s physiological responses to this type of exercise may also influence women’s participation in ST. Peterson and Gordon (2011) speculate that the full range of ST intervention outcomes have not been adequately disseminated to the general population; they are among several researchers that call on healthcare providers and public health practitioners to promote ST activities nationwide (Seguin et al., 2008; Smith, 2005). Assessing women’s
fundamental knowledge of the physical and quality of life benefits attributed to ST, as well as beliefs and perceptions of ST activities may be an appropriate starting point to determine how best to direct education and intervention efforts.

Haines, Thrine, Titlebaum, and Daprano (2008) studied a convenience sample of college-age women who did and did not strength train (NST) in a weight room. A 10-item “benefits of ST” survey was administered to 95 women who did not ST; 2.25% correctly selected all survey items that identified benefits of ST. The NST participants’ knowledge, barriers, and perceptions of weight training were assessed with a separate instrument before and after a three-day pilot program designed to dispel myths, instruct on the benefits of ST, and teach proper training technique (Haines et al., 2008). Pre-intervention quiz scores averaged 65%; following the three-day education and applied training intervention, quiz scores averaged 93% (Haines et al., 2008).

In the same study, participants who reported they did engage in ST (n= 171) did not complete the benefits and knowledge of ST surveys (Haines et al., 2008). The researchers did not provide an operational definition of ST or describe the ST participants’ ST activities; therefore, it is not known if the ST participants participated in valid ST activities and met national guidelines or compare knowledge levels (Haines et al., 2008). NST participants reported a lack of knowledge regarding how to strength train and intimidation by men present in the weight room was cited as the highest-ranking reason for not ST. Both variables are supported by other studies (Craig & Libert, 2007; Salvatore & Maracek, 2010). Lack of knowledge was also cited as a primary factor for not ST in another study involving college age students (Bryan & Rocheleau, 2002).

Conversely, Harne and Bixby (2005) asserted that women are aware of the benefits of ST whether they engage in the activity or not. Their conclusion is based on study results that demonstrated no significant difference in perceived benefits between women who strength train and those who do not; both ranked body image and health as equally important benefits of ST (Harne & Bixby, 2005). Knowledge levels of ST benefits and techniques, and the skills required to successfully participate in ST activities, were not evaluated. Bopp, Wilcox, Oberrecht, Kammerman, and McElmurray (2004) examined older rural women’s perceptions of ST. Participants in the focus groups generally reported positive attitudes regarding the concept of ST for women. Knowledge deficits were apparent regarding what study
participants believed constitutes ST, actual barriers and risks associated with ST, and the ability of all adults to engage in ST according to national guidelines (Bopp et al., 2004). The participants also self-reported a lack of knowledge about ST and the common misperception that women who ST become overly muscled, and the fear of “looking like a man” surfaced in focus group discussions (Bopp et al., 2004, p. 12). Khoury-Murphy and Murphy (1992) captured similar sentiments and knowledge gaps in describing program participants’ attitudes, knowledge and perceived barriers and the cultural challenges the researchers faced when implementing a ST program for older rural women in Alabama.

**Barriers and Motivators**

Few studies have been conducted on women’s barriers, motivators, attitudes, perceptions and experiences with respect to ST in a group setting (D’Abundo, 2009; Martin et al., 2007; McGrath et al., 2010; O’Dougherty et al., 2008). O’Dougherty et al. (2008) compared barriers and motivators for ST in 25 – 44 year old overweight and mildly obese women who participated in twice a week ST activities over a two year period. Lack of motivation and time constraints were the primary barriers reported in focus groups conducted with 49 women recruited from the larger study; 53% of the focus group participants reported their motivation decreased when the intervention shifted from a group to individual ST activities (O’Dougherty et al., 2008). Similar barriers have been identified in other studies addressing adherence to ST and general physical activity programs (Arikawa, O’Dougherty, & Schmitz, 2011; Caperchoine et al., 2009; Harne & Bixby, 2005).

**Role of the Group Fitness Instructor**

Given the anxiety, intimidation and lack of knowledge women express regarding ST in an individual context, such as in a fitness center’s weight room, a potential solution for engaging in ST activities is in a group fitness class. The influence an instructor may have on women’s attitudes, participation, and adherence to a ST regime with regard to their perceived status and own fitness-related attitudes and perceptions has been analyzed in the context of being an aerobic group fitness instructor (D’Abundo, 2007, 2009; Greenleaf, McGreer, & Parham, 2006). One study of female aerobic class participants and aerobics instructors reported that both groups expressed a preference for lightly toned muscles, a desire to avoid
gaining musculature and expressed a fear of becoming too muscular (Greenleaf et al., 2006). The instructors’ beliefs and attitudes towards the physical appearance of hypertrophied female musculature were somewhat surprising due to their position as fitness professionals.

The potential influence instructors may have on their students with regard to acceptability of ST and other health related topics needs to be considered (D’Abundo, 2007). There are no known studies that compare the perceptions and beliefs of female participants and fitness instructors in the group ST arena. O’Dougherty et al. (2008) reported on women’s expectations of the fitness instructors and personal trainers who trained them in a ST intervention. Detailed information on what the fitness professionals communicated to the participants and how they interacted with participants was not provided; however, the participants did express a desire for the fitness professional to provide “more pressure” for adherence and social accountability (O’Dougherty et al., 2008, p. 53). The acknowledged need for direction may be an indirect indication of the potential influence a fitness instructor can wield.

THE PRESENT STUDY

Despite a large body of evidence supporting numerous benefits of ST activities for women of all ages, participation rates in ST activities remain low. It has also been demonstrated that the group fitness setting may facilitate an individual’s adherence to and motivation for physical activity. Little research has examined perceptual and behavioral factors associated with women and ST to identify barriers and motivators. However, studies have frequently focused on women who do not ST and were typically conducted with either college-age or elderly women. Additionally, most ST research has framed ST as an individual activity, such as in a fitness center weight room or at home; ST in a group fitness context has received limited research attention. As such, mid-life women’s experiences with ST, especially those who have participated in group fitness ST, is an underdeveloped research area.

The current study conducted an initial exploration of this understudied group – women who were experienced group fitness participants. The study aims were to: (1) explore adult (ages 30–59 years old) women’s knowledge, beliefs and attitudes regarding ST; (2) identify individual characteristics of women who routinely engage in ST and compare
these attributes with women who do not; and (3) examine group fitness instructors’ experiences with and observations of the women they encounter while teaching group ST classes. The methods used to study the research questions were quantitative and qualitative. Physical activity knowledge, behaviors, and attitudes scales collected quantitative data with women who were experienced group fitness participants. One-time key informant interviews with group fitness participants and group fitness instructors informed the qualitative data.
CHAPTER 2

METHODS

A mixed methods approach was used to answer the research questions (Creswell & Clark, 2007). Mixed methods research is an eclectic method in which quantitative and qualitative research techniques, methods, approaches, concepts, or language are combined in one study (Johnson & Onwuegbuzie, 2004). Mixed-method designs may be thought of in terms of running two studies, one quantitative and one qualitative, within a larger effort (Johnson & Onwuegbuzie, 2004). The sample size was determined by reviewing relevant literature on mixed methods research. Collins, Onwuegbuzie, and Jiao (2007) investigated over 120 mixed methods studies. Based on this and other expert analysis, the current study sought to recruit the recommended minimum 6–10 participants for phenomenological data in the qualitative arm, and at least 64 participants for correlational, or quantitative data collection (Collins et al., 2007; Creswell & Clark, 2007).

Data collection in mixed methods designs may occur sequentially, with one form of data collected before the other, or concurrently, with both qualitative and quantitative data collected at the same time (Collins et al., 2007). Data collection occurred concurrently in the current study. With concurrent data collection, data collected from one method do not inform the data collected from the other, but data from both approaches are integrated and interpreted as part of analysis (Collins et al., 2007).

Quantitative data were collected using survey instruments and obtained information on attitudes, behaviors, and knowledge regarding women and strength training. Qualitative data were collected through individual in-depth interviews with three groups of participants: ST women, NST women, and ST group fitness instructors (GFI). Data collection occurred from late January until early March 2012. An attempt was made to ensure that both ST and NST participants were of equal size; volunteers were individually screened prior to interview and survey completion. However, participant availability and response to recruiting efforts impacted the final sample sizes for both groups.
The Institutional Review Board of San Diego State University approved the study, and all participants provided informed consent before engaging in study activities.

**SETTING**

The study took place in Southern California. Participants were recruited from group fitness classes in several public, private and government facilities in San Diego and Temecula, California. San Diego and Temecula are approximately 60 miles apart. One fee-based fitness center, known by the researcher to provide ST group fitness classes, was approached to support the study’s recruiting efforts. All classes offered at the center were one hour in duration. The participant and instructor base was overwhelmingly female. The privately owned business allowed recruiting efforts in the form of posting a recruiting flyer on the announcement board and placing additional copies in the waiting area.

Participants who were recruited from other locations were approached individually by the primary researcher before and after group fitness class sessions, or were referred to the researcher by instructors or other group fitness participants. The researcher did not request or receive organizational support from facilities other than the one described in the preceding paragraph.

**RECRUITMENT CRITERIA**

This section outlines inclusion criteria for study participation for two groups, women who participated in group fitness classes and group fitness instructors who taught strength training in a group fitness class setting.

**Group Fitness Participants**

Participants in this study consisted of adult women, ages 30–59, who were residents of Southern California, and routine participants in group fitness classes. Demographic data were collected from participants and are displayed in Table 1. All participants were required to have engaged in group fitness activities for a minimum of six months prior to participating in the study. Two groups comprised the group fitness participant component of the study: (1) women who ST in a group fitness setting as part of their routine physical activity plan, and (2) women who did not strength train in a group fitness setting (NST). Women who
Table 1. Demographic Characteristics of Group Fitness Participants

<table>
<thead>
<tr>
<th></th>
<th>Total sample</th>
<th>NST(^1)</th>
<th>ST(^2)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD) / % (N=53)</td>
<td>Mean (SD) / % (n=16)</td>
<td>Mean (SD) / % (n=37)</td>
<td></td>
</tr>
<tr>
<td>Mean age (SD)</td>
<td>41.48 (6.62)</td>
<td>39.94 (6.57)</td>
<td>42.17 (6.62)</td>
<td>0.14</td>
</tr>
<tr>
<td>% Latino, Hispanic,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexican/Mexican American or</td>
<td>32.08% (16)</td>
<td>41.18% (9)</td>
<td>58.82% (7)</td>
<td>0.34</td>
</tr>
<tr>
<td>of Spanish origin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% White</td>
<td>66.67% (34)</td>
<td>73.33% (11)</td>
<td>63.89% (23)</td>
<td></td>
</tr>
<tr>
<td>% Black/African American</td>
<td>7.84% (4)</td>
<td>-</td>
<td>11.11% (4)</td>
<td>-</td>
</tr>
<tr>
<td>% Asian</td>
<td>11.76% (6)</td>
<td>-</td>
<td>13.89% (5)</td>
<td></td>
</tr>
<tr>
<td>% Other</td>
<td>13.73% (7)</td>
<td>26.67% (4)</td>
<td>11.11% (4)</td>
<td></td>
</tr>
<tr>
<td>% married/living as married</td>
<td>73.58% (39)</td>
<td>75.00% (12)</td>
<td>72.97% (25)</td>
<td>0.22</td>
</tr>
<tr>
<td>Mean # of adults in home</td>
<td>2.26 (1.00)</td>
<td>2.19 (0.98)</td>
<td>2.30 (1.02)</td>
<td>0.78</td>
</tr>
<tr>
<td>Mean # of children in home</td>
<td>1.28 (1.47)</td>
<td>1.38 (1.78)</td>
<td>1.24 (1.34)</td>
<td>0.75</td>
</tr>
<tr>
<td>(SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% associate’s degree or higher</td>
<td>69.81% (37)</td>
<td>62.50% (10)</td>
<td>72.97% (27)</td>
<td>0.86</td>
</tr>
<tr>
<td>% employed at least part-time</td>
<td>84.91% (45)</td>
<td>93.75% (15)</td>
<td>81.08% (30)</td>
<td>0.95</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>33.96% (18)</td>
<td>31.25% (5)</td>
<td>35.14% (13)</td>
<td></td>
</tr>
<tr>
<td>Managerial</td>
<td>24.53% (13)</td>
<td>25.00% (4)</td>
<td>24.32% (9)</td>
<td></td>
</tr>
<tr>
<td>Clerical</td>
<td>13.21% (7)</td>
<td>18.75% (3)</td>
<td>10.81% (4)</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>11.32% (6)</td>
<td>18.75% (3)</td>
<td>8.10% (3)</td>
<td>-</td>
</tr>
<tr>
<td>Service Worker</td>
<td>3.77% (2)</td>
<td>-</td>
<td>5.41% (2)</td>
<td></td>
</tr>
<tr>
<td>Do not work outside home</td>
<td>13.21% (7)</td>
<td>14.29% (1)</td>
<td>16.22% (6)</td>
<td></td>
</tr>
<tr>
<td>Mean hours worked per week(SD)</td>
<td>29.99 (17.43)</td>
<td>32.53 (13.86)</td>
<td>28.89 (18.83)</td>
<td>0.78</td>
</tr>
</tbody>
</table>

reported they were engaged in ST were included if they had routinely participated in ST group fitness classes two times or more per week, for a minimum of six months prior to enrollment in the current study. The NST group included women who had either never strength trained, or had not strength trained within the last year, but did participate in aerobic-type group fitness classes (e.g., step aerobics, Zumba©) for at least six months prior. There were no additional aerobic group fitness participation criteria for women in the ST group.

**Group Fitness Instructors**

Experience teaching strength training in a group exercise format was the primary inclusion criteria for the instructors (n=6) involved in the study. Instructors were required to have a minimum of three years experience in the group fitness setting and a minimum of one-
year experience teaching strength training. To progress from a novice to an expert in one’s profession has been described as a process that may take a minimum of five to ten years (Cheetham & Chivers, 2005; Ericsson, Krampe, & Tesche-Romer, 1993). The minimum criterion of three years of teaching experience was established in the current study to ensure that an adequate and competent sample of instructors could be obtained. Previous research has demonstrated that fitness educators with approximately three years’ teaching experience are considered to be in the “competent” stage of professional development, and are generally able to recognize similarities in recurring situations and can provide richly detailed accounts of their observations, while drawing upon their own experience to make sense of the phenomena (Bell, 1997).

Certification through a nationally recognized fitness association was an additional desired inclusion criterion. Certification is a standardized and unbiased measure of a fitness instructor’s ability to apply relevant knowledge and skills (American Council on Exercise, 2011). Group fitness instructor examinations that lead to certification assess knowledge in a number of areas, such as exercise programming, instructional methods, group leadership, and class management (American Council on Exercise, 2011).

**PROCEDURES**

The following section details procedures for recruiting and data collection for the women who attend group fitness classes (ST and NST) and the group fitness instructors that teach ST classes. Female group fitness participants who met inclusion criteria were recruited from locations that offered ST group fitness classes in Southern California. Participants were recruited through flyers posted in one group fitness facility in Temecula and handed to class attendees at the beginning or end of classes, word-of-mouth, and e-mail and social networking (e.g., Facebook website) communication methods. Screening forms were administered at time of initial contact whenever possible to ensure study inclusion and obtain follow-up contact information. The screening form for group fitness participants can be found in Appendix A. All enrolled ST and NST group fitness participants were also asked to complete a demographic questionnaire, which can be found in Appendix B.

Individual in-depth, semi-structured interviews were conducted with 15 ST and 9 NST women. The first women in each category who met inclusion criteria and were willing
to participate in an in-depth interview were selected for interviews. Interviewees were asked for their opinions, as experienced group fitness participants, on relevant topics, including the perceived benefits of strength training, social influences on exercise participation, maintaining exercise motivation, beliefs about certain strategies believed to minimize ST muscle mass gains and what their response would be to a hypothetical comment about increased muscle mass in their arms or legs.

GFI participation in the study consisted of individual semi-structured interviews as well. ST GFI’s were recruited from the same facilities, through purposeful sampling. The screening form used to evaluate inclusion criteria for GFI participants can be found in Appendix C. Five of the instructors worked as independently contracted employees at public, private, and/or government fitness centers, one instructor was the proprietor of a martial arts business that provided ST group fitness classes. The primary researcher had attended or observed classes taught by all GFI’s and approached them outside of class time for recruiting purposes. Before the start of GFI individual interviews, each GFI was asked to complete a brief questionnaire related to their current group-exercise certifications, years of teaching experience, and class formats taught, and primary teaching audience. The document can be found in Appendix D. Interview questions for instructors were related to their observations and experiences with women in a group fitness setting. Of particular interest were the instructors’ appraisals of their students’ attitudes, knowledge, and perceptions of strength training.

All individual interviews were scheduled at the convenience of the participant. Interviews were conducted at coffee shops, private homes, fitness centers, and worksites. Participants were compensated for their participation with five-dollar coffee shop gift card or bottled water and sports nutrition bar of an equivalent value. The significance and purpose of the current study were explained to the participants. Participants were verbally asked for permission to audio-record the interview. All participants gave verbal and written consent for recording. Interviews were audio-recorded using a Sony ICD-PX312 digital voice recorder and later transcribed into a Microsoft Word document. The interview guide for group fitness participants can be found in Appendix E; the GFI interview guide is located in Appendix F.
MEASURES

GFI, NST, and ST interviews were conducted with four page semi-structured interview guides, consisting of 13 questions each. The GFI interview guide included general questions regarding the interviewee’s teaching experience and various aspects of the ST classes taught, as well as questions specific to their observations, perceptions, and experiences with teaching adult women in the group fitness ST setting.

Topic areas for the group fitness participant interviews included the individual’s history as a group fitness participant, current experiences in the group fitness setting, and several questions regarding individual knowledge, perceptions, attitudes, and beliefs surrounding strength training. The questions were the same for NST and ST with one exception; women in the NST category were asked to state the reason(s) they do not currently engage in strength training, and women in the ST category were asked to state the reason(s) they do engage in strength training.

QUANTITATIVE METHODS - DATA COLLECTION AND ANALYSIS

The composition of the overall survey sample of 53 women who reported participating in group fitness classes for more than six months is described in Table 1 (p. 19). The 24 women who were selected for interviews as discussed in the preceding section completed survey instruments, as did an additional 29 women who met study inclusion criteria. Measures are described in detail in the proceeding section, and copies of each instrument are included in the appendices.

Sociodemographics

Age, race/ethnicity, education level, marital status, occupation and number of hours worked each week for pay, number of children or other persons the participant cared for in her home, and financial costs, if any, associated with participation in group fitness activities was obtained through self-report. Sociodemographic data provided by participants on a self-report questionnaire at the conclusion of the interview is presented in Table 1 (p. 19). Instructors were asked to provide the following information at the conclusion of their interview: Age, race/ethnicity, gender, education level, and number of hours worked each
week for pay. Self-reported sociodemographic data from group fitness instructor are located in Table 2.

**Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2)**

The Behavioral Regulation in Exercise Questionnaire (BREQ) measures the variable forms of motivation that denote the qualitatively distinct ways that a behavior can be regulated, according to SDT (Mullan et al., 1997). The BREQ-2 assesses external, identified, introjected, and intrinsic regulations, and the tool may have applications in detailed assessments of motivation from SDT perspective (Markland & Tobin, 2004). Integrated regulation is not assessed on the BREQ-2. The BREQ-2 is a modification of the BREQ; the revised version includes a set of amotivation questions (Markland & Tobin, 2004). A copy of the BREQ-2 can be found in Appendix G.

The BREQ-2 consists of 19 items with Likert-scale responses. The following are example items to illustrate the BREQ-2 subscales: “I don’t see the point in exercising” (amotivation; four items); “I exercise because other people say I should” (external regulation; four items); “I feel guilty when I don’t exercise (introjected regulation; three items); “I value the benefits of exercise” (identified regulation; four items); “I enjoy my exercise sessions” (intrinsic regulation; four items). Each item is measured on a five-point scale ranging from 0 (‘not true for me’) to 4 (‘very true for me’). The mean of each of subscale items is calculated for an individual regulation score. The Relative Autonomy Index (RAI) is a single score estimate of the individual’s overall degree of self-determination. The RAI is obtained by weighting each item on the behavioral subscales [i.e., amotivation × (-3), external regulation × (-2), introjected regulation × (-1), identified regulation × (+2), intrinsic regulation × (+3)] and then summing the weighted scores. Previous research has supported the reliability (α = 0.75) and construct validity (factorial and construct) of the BREQ-2 (Markland & Tobin, 2004; Wilson & Rodgers, 2004). Cronbach’s alpha reliability coefficients for BREQ-2 subscales have been deemed acceptable (amotivation, 0.83; external regulation, 0.79; introjected regulation, 0.80; identified regulation, 0.73; intrinsic regulation, 0.86) (Markland & Tobin, 2004). Markland and Tobin (2004) caution, however, that an RAI score is set to meaningful only if the five individual behavioral regulation subscales demonstrate
<table>
<thead>
<tr>
<th>GFI</th>
<th>Location</th>
<th>Age (years)</th>
<th>Latino</th>
<th>Race</th>
<th>Gender</th>
<th>Number of Years Teaching Group Fitness</th>
<th>Certification(s)</th>
<th>Hours per Week Spent Teaching Group Fitness</th>
<th>Classes Taught per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>San Diego</td>
<td>45</td>
<td>Yes</td>
<td>White</td>
<td>Female</td>
<td>3-5</td>
<td>RKC¹</td>
<td>10</td>
<td>5-10</td>
</tr>
<tr>
<td>2</td>
<td>San Diego</td>
<td>52</td>
<td>No</td>
<td>White</td>
<td>Male</td>
<td>7-10</td>
<td>RKC¹</td>
<td>28</td>
<td>&gt;10</td>
</tr>
<tr>
<td>3</td>
<td>San Diego</td>
<td>53</td>
<td>No</td>
<td>Other</td>
<td>Male</td>
<td>10-15</td>
<td>AFAA²</td>
<td>8</td>
<td>3-5</td>
</tr>
<tr>
<td>4</td>
<td>Temecula</td>
<td>42</td>
<td>No</td>
<td>White</td>
<td>Female</td>
<td>3-5</td>
<td>Cross-Fit KB⁴ Spin³</td>
<td>12</td>
<td>&gt;10</td>
</tr>
<tr>
<td>5</td>
<td>Temecula</td>
<td>44</td>
<td>No</td>
<td>White</td>
<td>Female</td>
<td>3-5</td>
<td>AFAA Spin³ KB⁴ Spin³</td>
<td>20</td>
<td>3-5</td>
</tr>
<tr>
<td>6</td>
<td>Temecula</td>
<td>36</td>
<td>No</td>
<td>Other</td>
<td>Male</td>
<td>7-10</td>
<td>*</td>
<td>30</td>
<td>3-5</td>
</tr>
</tbody>
</table>

¹RKC=Russian Kettlebell Certification
²AFAA=Aerobics and Fitness Association of America
³Spin=Indoor Cycling Instructor Certification
⁴KB=Kettlebell Instructor Certification
*Instructor does not hold U.S. group fitness certifications. Instructor is master level Brazilian Jujitsu and Mixed Martial Arts qualified instructor who also teaches group strength and conditioning classes.
orderly variations in self-determination, meaning subscales should be more positively correlated to the next closest subscale than other subscales, and reflect progressive increases along the motivation continuum; the RAI score is invalid if subscales do not fit a simplex pattern. Further, a substantial loss of information is associated with use of the RAI (Markland & Tobin, 2004). For these reasons, the current study did not include the RAI in analyses. The current study measured the five behavioral regulation subscales and these results were included in statistical analyses.

**Muscular Development Scale**

Loze and Collins (1998) created the Muscular Development Scale (MDS) to assess motives for resistance, or strength training, as separate and distinguishable from other exercise motives. The 13-item survey was derived from the Exercise Motivations Inventory (EMI), a broad survey of reasons for exercise and health-related behaviors (Loze & Collins, 1998; Markland & Hardy, 1993). Responses are measured on a six-point Likert scale ranging from 0 (‘not at all’) to 5 (‘very much’). The survey is divided into three subareas, muscular development (“I exercise to achieve greater muscle mass”), weight management (“I exercise because exercise helps me burn calories”), and appearance (“I exercise because I like to be seen as a fit and healthy person”). The weight management and appearance items were incorporated directly from the EMI; muscular development questions were formulated by a panel of five experienced resistance-training instructors (Loze & Collins, 1998).

In initial testing, the MDS subscales demonstrated validity and internal reliability, and supported the concept of muscular development as independent from weight management and appearance motivations in both men and women (Loze & Collins, 1998). Cronbach’s alpha reliability coefficients for the subscales were considered acceptable (muscular development $\alpha=0.92$; weight management $\alpha=0.98$; appearance, $\alpha=0.92$). Subscale scores were created by calculating the mean for each of the three subareas. The subgroup with the highest mean provided an indication of the participant’s strongest exercise motive – appearance, weight management or muscular development. A copy of the MDS survey can be found in Appendix H.
Physical Activity – Change Strategies

Marcus, Rossi, Selby, Niura, and Adams (1992) developed a tool to measure the 10 Processes of Change; overall, the instrument was acceptable with regard to validity and reliability. The Cronbach alpha co-efficient for social liberation was 0.62; scores for the other nine Processes of Change measures ranged from 0.72 to 0.88 (Marcus et al., 1992). Nigg, Norman, Rossi, and Benisovich (1999) developed a modified version of the original Processes of Change questionnaire for exercise behaviors. The modified questionnaire also sought to measure all 10 Processes of Change; however, in the current study, a further refinement of this survey was used (Norman, Sallis, & Gaskins, 2005). The current study used the 15-item Physical Activity Change Strategies tool, which demonstrated good reliability (α= 0.93), and measured consciousness raising, self reevaluation, counter-conditioning, helping relationships, reinforcement management, self liberation, and stimulus control (Norman et al., 2005). This version of the survey was notably used in a multi-site, randomized controlled primary care and home based physical activity intervention (Patrick et al., 2006). A copy of the Physical Activity Change Strategies survey is located in Appendix I.

Participants were asked to recall how frequently each of the processes was used during the past month with each item rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (repeatedly). A composite strategy score was created by calculating the mean of items 1 to 15. A higher composite strategy score indicated greater use of the Processes of Change.

Knowledge of Strength Training and Aerobic Conditioning

A 15-item true or false and multiple-choice survey (Fitness Quiz), developed by the primary researcher, was used to assess group fitness participants’ general knowledge of current national physical activity guidelines and standards. While conducting formative research in various group fitness settings, the author observed that knowledge of general physical activity recommendations and benefits of exercise may contribute to women’s decisions to participate in strength training. A copy of the Fitness Quiz can be found in Appendix J.
Survey questions were created from reviewing publicly accessible consumer-oriented facts and information found on government sponsored (Centers for Disease Control and Prevention, Medline Plus, United States Department of Health and Human Services, and National Heart, Lung, and Blood Institute), a professional organization’s (American College of Sports Medicine) and a respected medical institution’s (Mayo Clinic) websites in November 2011. Individual scores for the Fitness Quiz were obtained by dividing the number of correct responses by the total number of items, and multiplying by 100, to determine a percentage score on a scale of 0-100%.

**Qualitative Data**

In qualitative research, a code is most often a word or short phrase that symbolically assigns one comprehensive, meaningful attribute to capture the essence of a data segment; codes represent and summarize the principal content and core of qualitative data (Saldaña, 2009). Interview transcripts were individually content analyzed by the primary researcher. The group fitness participant and GFI interview transcripts were coded separately; the codes and themes identified in each group were informally compared while coding was ongoing and systematically compared after both sets of data were coded and analyzed. Coding the interview data was accomplished by looking for recurring themes, situations, and keywords. A combination of open coding (researcher identified codes) and in-vivo (terms used by participants) coding was used (Corbin & Strauss, 2008). As coding progressed, coding-by-list (assigning a pre-existing code to a new portion of data) was employed when appropriate.

Individual interviews were read line-by-line; text that was considered relevant to the research questions was highlighted. Next, the highlighted individual interview question responses were collectively reviewed question-by-question. Similar words, statements, and expressions of concepts, attitudes, and beliefs were grouped together and scrutinized for shared meaning. Word frequency counts using a qualitative data analysis software program were reviewed as an additional check to ensure recurring keywords were not overlooked. Hand-written field notes and computer generated memos also supported coding decisions. Following initial code development, a second coding cycle was performed to merge
redundant or delete invalid codes. Similar codes were then grouped and assigned to categories and themes were identified.

**ANALYSIS**

The current study was primarily an exploratory study and, as such, a formal hypothesis was not postulated. The primary research question centered on the beliefs, attitudes, and perceptions regarding ST of everyday women with long-standing exercise experience, particularly those who participated in ST activities. A secondary research question contemplated whether knowledge, beliefs, attitudes and perceptions varied between women who ST and those who do not (NST). Qualitative and quantitative analyses were conducted to organize observations, compare and interpret the data. Descriptive statistics were computed to describe the demographic composition of the sample and determine if significant differences or associations might exist between the ST and NST groups in demographics and/or survey results.

Qualitative content analysis differs from quantitative analysis in that it does not result in figures and statistically significant data; rather, it reveals patterns, themes, and categories that are valuable in the context of social reality (Zhang & Wildemuth, 2009). Coding to identify themes and categories started early in the data collection process and continued constantly to iteratively inform each successive interview, which is typical in qualitative analysis methods (Corbin & Strauss, 2008; Zhang & Wildemuth, 2009).

As recommended by Corbin and Strauss (2008), coding took place in multiple stages. The initial coding process was an open coding process. Each interview transcript was closely read and annotated with memos, text was pooled, and concepts were highlighted and labeled. The investigator read and reviewed material that corresponded to specific codes or junctions of codes, and summarized findings in analytic memos (Zhang & Wildemuth, 2009). Each subsequent transcript was compared with the previous transcripts to facilitate developing categories and their properties.

As the coding proceeded, additional themes and concepts emerged. Emerging concepts and themes, and their relationships to each other, were further analyzed and resulted in a model of individual strength training behaviors and characteristics in the context of
group fitness ST participation (Zhang & Wildemuth, 2009). These analyses produced insight into strength training motivations, attitudes and perceptions of women in the study group that were subsequently applied to the data collected in the quantitative component of the current study.

Responses to individual interview questions were analyzed for commonalities and differences in attitudes, beliefs, and perceptions between NST and ST women. The categories and themes that emerged from the interviews with group fitness participants were then compared and contrasted with GFI interview results. Responses to survey and demographic questionnaires completed by ST and NST participants were evaluated for trends and correlations.

Quantitative data analysis was completed using StatXact, version 9.0.0, produced by the Cytel Corporation (2010). ATLAS.ti version 6.2 software was used in the qualitative data analysis process (Scientific Software Development, 2010).
CHAPTER 3

RESULTS

The purpose of the current study was to examine factors related to adult women’s experiences with ST in a group fitness setting. Qualitative data analyses ultimately revealed that women’s participation in ST was associated with the concept of trust. The primary researcher determined trust existed in the context of the social environment and as an intrapersonal factor. The ST women’s trust in the GFI’s who trained and educated them illustrated an essential helping relationship that influenced self-efficacy and competence; trust generated within the group fitness setting supported feelings of relatedness and was a safe place for the women to challenge themselves and societal restrictions on women. The second element of trust may be described as the women’s underlying belief in their body’s capabilities and capacity for strength. They conveyed a sense of trust in their body’s response to ST; for example, they trusted their body was responding appropriately, despite weight gain and criticism from others as a result of increased muscle mass. Themes related to ST participation included health/healthy aging and appearance, how I look and feel, and anyone can do it, but a certain type does it. Information was gathered from women who did and did not ST, and from group fitness instructors who taught ST to adult women. The following sections describe and compare NST and ST group fitness participants’ characteristics, attitudes, beliefs, and perceptions regarding the group fitness experience, ST activities, and individuals who strength train. Interview responses from group fitness instructors enriched and expanded the concepts and themes express by the group fitness participants.

DEMOGRAPHIC CHARACTERISTICS

As previously noted, group fitness and GFI participant demographics are reported in Tables 1 (p. 19) and Table 2 (p. 24). Fifty-three group fitness participants and six GFI participants completed the written surveys. One NST participant response was missing ethnicity information, and one ST participant response was missing race information; it is
unclear if the missing data was due to misunderstanding that both items requested a response, or failure to notice that there were two separate survey items. Two ST participants declined to provide their age; both indicated on the screening form that they met age inclusion criteria, and were between the ages of 30 and 59 years. The NST sample’s mean age was 39.94 (SD=6.57), and the ST sample’s mean age was 42.17 (SD=6.62). Overall, 32.08% of sample participants reported a Latino, Hispanic, Mexican or Mexican-American origin; 41.18% were NST and 58.82% were ST. Overall, 66.67% of the participants were white, 11.76% were Asian, 7.84% were black or African-American, and the remaining 13.72% identified themselves as Pacific Islander, American Indian, or other race. Sixty-four percent of the participants were married and living with their spouse; 84.92% lived in households with two or more adults over 18 years of age, including the participant. Households with no children under the age of 18 years were reported by 37.74% of study participants; 56.60% had one to three children; and 5.66% reported five or six children living in their household.

Participants with an associate’s degree or higher was 69.81%; the remaining 30.19% reported at a minimum, a high school diploma or GED, technical school after high school, or some college. More than half (52.83%) of all participants worked full time, 16.98% worked part-time, and 15.09% were self-employed. Of the participants who were employed, 58.49% were in professional, technical, or managerial type occupations, and 28.30% worked in clerical, sales, or service type occupations.

Participants were how they got to their fitness classes. Responses to this item indicated that all participants drove themselves to their fitness classes, and this item was removed from analysis. One participant selected two responses, “drive myself” and “walk.” Participants were asked to indicate the amount paid for fitness classes. Women who did not pay for fitness classes comprised 18.87% of the sample; 13.20% paid up to ten dollars per class, 28.30% paid on a monthly basis, up to fifty dollars per month; and 39.62% paid on a monthly basis, more than fifty dollars per month.

The GFI sample, comprised of three male and three female instructors, had a mean age of 45.33 (SD=6.38). One GFI reported a Latino, Hispanic, Mexican or Mexican-American origin. Sixty-seven percent of the GFI sample was white; the remaining 33% responded “other” for race. Three of the GFI sample had three-to-five years’ experience
teaching group fitness classes; two had seven-to-ten years’ experience, and one had 10-15 years’ experience teaching. Three GFI’s taught three-to-five classes per week, one taught five-to-ten classes, and the other two taught more than 10 classes per week. Two GFI’s were certified by the Aerobics and Fitness Association of America; other reported certifications included Russian Kettlebell Certification, American Fitness Professionals and Associates, and Spinning Instructor.

The instructors were recruited based on the primary researcher’s knowledge of their ST experience and interactions with the population of interest, adult women with at least six months’ group exercise experience. Two instructors taught strength and aerobics classes at the same facility in Temecula; one also taught at two other facilities and one taught group “boot camp” fitness classes from her home. The third instructor in Temecula owned a mixed martial arts facility and taught strength and conditioning classes at that location. In San Diego, two of the instructors co-facilitated a kettlebell ST class on a military base, and both taught ST group classes in the community. The third San Diego instructor taught strength and aerobics classes at a different military base and in the community. A number of the group fitness participants who participated in interviews attended classes taught by several GFI interview participants.

THE GROUP FITNESS EXPERIENCE

Whether categorized as NST or ST, most participants described two factors that led to them becoming long-term group fitness participants. A major life event, such as the birth of a child, divorce, milestone birthday, loss of employment, or a change in health status, was cited as an initial motivator for eight of the 24 women interviewed. The other idea expressed by almost all participants was that group fitness was “something I had wanted to try.” The NST group was more likely to initiate participation in an aerobics class, such as Zumba, with a friend, though, while ST women typically indicated they started taking classes on their own. Adding or shifting to ST classes was a progression from aerobics classes for many of the ST women, revealed in such comments as, “I was ready to take my workouts to the next level” and “you can only do so much with cardio.”
Feelings of Relatedness

When asked to describe the essential elements of their favorite class, pleasure, or “fun,” was key for NST women; Zumba was described as party-like atmosphere, more akin to a social event than a workout. Several stated, “It doesn’t feel like I am working out.” Seven of the nine NST women stated Zumba was their favorite (and often only) class attended. The other two NST women enjoyed Spin, an indoor cycling class, and Piloxing, a routine that is a combination of Pilates and boxing movements, class the most. Personal characteristics of the instructor and the high level of workout intensity were the key factors identified for enjoyment in the Spin and Piloxing classes; the classes were taught by different instructors.

ST women also discussed the social aspects and having fun in their favorite class, but with understated differences. ST women described a sense of camaraderie, and the class experience was likened to a challenge, met with comrades. The description of one ST woman exemplifies the notion “we’re all here for the same reason,” identified by the ST group:

…when you see other women pushing themselves…you have older ladies in the class room and it’s so inspiring, and that sense of camaraderie that I think we lose sometimes in daily life and sometimes even in work settings; when you have a sense of camaraderie, of women, all of us pushing ourselves… you know, you have mothers, you have grandmothers in there, I mean, you have everybody…just …you know, blood, sweat, and tears, but they are for a good result. It’s actually enjoyable and it’s fun to see that and it’s inspiring, and that’s…my daily fix.

Group Fitness Participants’ Perceptions of the GFI

Group fitness participants were not asked specific questions about their perceptions of an effective GFI; descriptive qualities and the influence of the GFI did surface during the course of the interviews, though. The importance of a knowledgeable, supportive instructor who “pushes me,” to either complete the workout or to increase the challenge associated with the workout, typically by increasing the amount of weight used, was identified by ST women as an essential element. GFI gender was not identified as a concern; eleven ST women attended classes primarily taught by a female instructor and four others attended classes taught by a male or co-instructed by a male and a female GFI.

One participant stated an instructor with “her own story” was beneficial; this
participant’s GFI lost more than 100 pounds and described her personal struggles with weight, food, and body image during class. This GFI also teaches Spin class; several ST and NST women commented on her enthusiasm, ST knowledge, and practical approach. Women who attended class with a male GFI cited his ST knowledge and friendly, yet matter-of-fact style as important qualities.

All group fitness interviewees were asked to describe the GFI’s discussion of technique, benefits, and other aspects of ST during fitness classes. The concept that emerged was “instructors do not talk about ST unless they teach it.” NST women recalled an occasional instance when an aerobics instructor would mention the importance of incorporating ST as part of an overall fitness program. Yoga and Pilates were the two classes typically recommended by GFI’s who teach aerobics. One NST indicated she routinely took a Spin class led by a GFI who also teaches ST; the GFI frequently encouraged her to attend ST classes. ST participants reported GFI’s tend to focus on the benefits of specific exercises as they were performing them, and proper technique and form. Discussion of health and other benefits of ST during class was limited.

GFI Perspectives on Group Fitness

The GFI participants were asked general questions about the format, composition, and characteristics of the ST classes they taught. Five of the six instructors indicated that their classes were either primarily composed of women, or that they had noticed an increase in the number of female participants in their classes within the last few years. The GFI responses generally mirrored and/or confirmed responses given by the group fitness participants. One GFI did note that women who are new to ST are more likely to attend a class with a friend than women who have experience with ST activities. In the group fitness participant sample, the NST reported initiating class attendance with a friend more often than the ST group. The group fitness setting as a supportive environment was identified by many of the group fitness participants and this concept was confirmed by the GFI’s. A male GFI described the encouraging atmosphere in a kettlebell class he teaches:

…when somebody is the last one doing it; everybody is cheering them on…everybody is being supportive, because everybody is going down the same path of this arduous workout. So, there tends to be this traction, gestalt, with the
group setting…You can’t hide from what we do, you’re going to suffer, and there is something about going through that fire that’s a tempering steel, and you come out the other side stronger; it’s just the way it is.

With regard to discussion of ST techniques, benefits, and guidelines, the GFI sample indicated they primarily focus their attention on ST technique and form for injury prevention and maximum exercise benefit. When the GFI’s talked about benefits of ST with their students, the emphasis was generally on functional fitness and healthy aging. Specific benefits discussed included improved cardiac and musculoskeletal health and metabolism rates, injury prevention, and enhanced ability to conduct their activities of daily living (ADL).

**PERCEPTION OF STRENGTH TRAINING ACTIVITIES**

When asked to describe ST activities, the use of weights was overwhelmingly the first response for all ST and NST participants. NST women frequently offered perceived outcomes of ST, such as toning, bulking up, and strengthening when asked about strength training activities. Most ST women followed their initial response, “using weights,” with another ST method, such as exercises that use body weight for resistance, or specialized equipment, such as the Pilates Reformer and the TRX and Gravity System machines. One ST woman captured the concept of “so many ways to do it” when she compared her group fitness experiences to her previous individual ST activities: “I just think it's more accessible than maybe I thought it was previously, because you don't need a bunch of stuff to get a really great workout.”

Several NST women correctly identified other activities associated with ST, such as using body weight for resistance and a method that involves full-body resistance exercises with long industrial size ropes. The NST woman who described the rope method had exposure to ST in a “boot camp” strength and conditioning training program approximately one year prior to the current study. One NST considered Zumba Toning a ST activity. Zumba Toning is described as the use of one to two-and-a-half pound sand filled “maraca-like toning sticks,” during a primarily aerobic workout (Zumba, 2012). Zumba Toning is marketed as a strength-training, body-sculpting, and toning activity; it is not known if the method meets the ST guidelines used by the current study.
GFI OBSERVATIONS OF WOMEN’S ST KNOWLEDGE

The GFI participants perceived women’s knowledge of what constitutes ST activities as minimal. One instructor noted, “I don’t think the average woman knows very much at all. I really don’t….some of them don’t even…have never even heard of strength training. They are not even sure what is involved in strength training.” This observation corresponds to the group fitness participants’ responses in that women who had more exposure to ST classes and activities were able to list more methods than others were. One GFI referred to group fitness participants’ need for a “paradigm shift,” regarding what constitutes ST. His assertion, “I don’t need fancy equipment, I don’t need hydraulics, I don’t need fancy shoes…” reinforced the statement by the ST woman who reported increased awareness of ST options after attending a group fitness ST class.

All GFI participants described their observation that many of the women in their classes lack knowledge of proper nutrition. General knowledge deficits regarding a balanced diet, lack of awareness of dietary changes necessitated by strength training, and women’s emotional struggles with food were issues mentioned by the three female GFI’s; the male GFI’s spoke broadly of women’s need to know more about “good nutrition.” One male GFI stated he asks specific questions about alcohol and fast food use and amounts when a participant “complains she is not making any progress.” The GFI participants brought up women’s relationship with food independently; the interview guide did not include diet or nutrition related questions.

PERCEPTION OF A PERSON WHO STRENGTH TRAINS

Participants were asked to describe the type of person that strength trains. Common themes emerged; ST and NST participants consistently verbalized a belief that “anyone can do it.” When probed on whether age, gender, health status, or other personal characteristics should or would prevent an individual from engaging in ST, both groups believed there are few reasons not to ST. Reasons participants gave to avoid ST included pre-existing injury, heart disease, and very young children. However, when participants started describing attributes of a strength training person, the theme shifted to a more defined image, and the
concept was refined to incorporate the notion that although anyone can do it, not everyone does it, and there are factors that may distinguish those that do strength train.

**Descriptions of a Strength Trainer**

A number of the ST women referred to themselves as the type of person who strength trains; others stated they do not have a defined image of a person that strength trains. A petite homemaker in her mid-50’s stated, “I don't really have a type, because I don’t fit the type; I am small, I am a woman, I am older. I don’t see a lot of people like me strength training.” Another ST woman described a married couple she works out with; they are in their seventies and regularly participate in a high-intensity strength and conditioning group workout program.

Despite a conviction that ST is appropriate for all persons, most participants expressed the belief that a ST individual possesses certain attributes. According to one ST woman, “Most women that strength train, you can tell. They have this posture; you can just kind of spot them out.” Traits of a strength trainer as identified by women who ST included someone who is driven, confident, committed, disciplined, and who enjoys a challenge. A ST individual was perceived as internally motivated:

It’s hard to do if you don't want to do it yourself. If someone tells you to do it, you will do it for little bit, but there has got to be something, it's got to be something inside you, that says, “Okay I'm going to do this,” because it is not always – it isn't, like, immediately fun; it’s fun, it’s what you put into it and what you end up with....Sometimes it hurts, right? It is hard. Someone with that motivation takes what they can out of it and it’s fun.

NST women often referenced a specific person when describing a ST person, as in “A Marine and my husband,” “a weightlifter, a boxer,” “my Zumba and Spin instructors; they could be a model for that.” The image of a muscular young male or a bulky woman was also associated with ST by several NST women.

**The Type of Woman Who Strength Trains: The GFI Perspective**

The GFI sample reported having a diversity of participants in their classes with regard to age, gender, and fitness level, supporting the aforementioned concept that “anyone can
The instructors were asked to describe common characteristics of women who ST on a regular basis. While the GFI responses were similar to the group fitness participants in descriptive terms such as “driven,” “confident,” and “happy,” other views emerged. One GFI described a ST woman as, “a mom who is busier than hell, or a woman how might not have kids but is going to school and working, and they’ve realized how important it is.” Racial disparities in ST rates were specifically pointed out by two GFIs as well; “…they do tend to be predominantly white….minority groups are a little further behind the learning curve as far as strength training. We need to get Hispanic or Indian or African-American women in there…I see that in diet, too.”

In stark contrast to the confident, driven description of a ST provided by almost all interview participants, a female GFI described how she first encounters some of her female students:

They usually come to me at a point where they turn themselves over to me; they’re just willing to say, “Okay, I want help;” or “Okay, I want to get strong;” or “I want to lose weight.” They just trust me to guide them in that direction.

This GFI also described an experience in which she spent four hours talking with and later received an email message pleading for help from a woman who had ostensibly approached her for ST instruction. She stated, “…trainers should be aware for females it is an emotional journey as much as, probably more, between the ears as it is the body…I have never been approached in that form of desperation for help from a male for training.” Another GFI echoed similar sentiments when discussing his experiences with adult women as a personal trainer, “…we spent more time, I hate to say it, with them telling me their marriage issues and their husband issues than we did training.” He indicated that in a group setting, personal disclosure is minimal and often superficial; the choreographed nature of fitness classes permit little time for conversation.

**PERCEIVED BENEFITS OF STRENGTH TRAINING**

Responses to the question regarding the perceived benefits of strength training described by ST and NST participants were broadly categorized by themes of health, appearance, and well-being.
Health Benefits

Improved bone density, primary and secondary disease prevention, and increased endurance and strength were cited as commonly perceived health benefits. Women who participated in ST described improvements in musculoskeletal pain, improved general fitness, enhanced sleep quality, and decreased susceptibility to acute illness as some of the health benefits. Twelve of the 15 ST women expressed a desire to maintain good health while aging, and prevent age-related declines in function. The NST group described benefits in terms of weight loss, disease prevention (“keep your heart healthy” and “improve your blood pressure”), and an overall improved health status.

Appearance

Appearance figured prominently in most participant responses with regard to perceived benefits of ST. Women who ST reported feelings of satisfaction, pride, and pleasure with the physical changes that accompany ST. One ST participant asked, “What’s more fun than seeing muscle on your own body?” Appearance-related benefits perceived by ST women included an improved relationship with their body weight; several revealed that ST in a group fitness setting helped them resolve struggles with “the number on the scale,” meaning they placed less importance on their body weight, even though ST may result in a weight gain. Improved muscle tone and overall appearance were ST benefits cited by NST women.

Wellbeing Benefits

Another category of perceived benefits were identified and labeled “well-being” benefits. Many ST women stated the emotional and mental outcomes they experienced from ST were as valued as appearance-related benefits. The concept of “how it makes me feel,” included themes of strength and empowerment, stress reduction, and the emotionally therapeutic value experienced when engaging in ST. Of the women who did not strength train, one of the nine participants described an “improved sense of well-being” as a perceived benefit of ST, but otherwise, the NST group did not state improved mental and emotional status as perceived benefit of ST.
GFI Description of ST Benefits

The GFI sample promoted ST in terms of health and functional fitness, versus appearance and weight loss. One GFI discussed how he illustrated the benefits of ST to older women by asking them to consider the impact of limited upper body strength on their ability to help themselves and others in a scenario such as a natural disaster or an automobile accident. With regard to weight and appearance, all GFI’s acknowledged awareness of the importance placed on these concepts by most women. However, the GFI’s in the current study consistently attempted to accentuate the lifestyle and overall well-being benefits associated with ST, and discouraged women from attempting “quick-fix” methods to achieve a short-term weight loss or appearance related goal. A GFI who personally lost more than one hundred pounds stated:

I try not to focus on weight loss goals per se…I think women beat themselves up about that anyway and I don’t want people to think that “Well, I have 20 pounds to lose and when I’ve lost the 20 pounds, I’m going to stop.”

The concept of empowerment as a result of strength training did come up with the ST women; however, the GFI’s discussed the transformative power of ST in detail. One GFI stated a belief in the empowering effect of ST for women who have a history of physical or emotional abuse. This GFI also commented on observing wardrobe transitions as some women progress in her class: “…all of a sudden they’re wearing clothes that fit. They go to Wal-Mart; they buy themselves their own exercise pants and give their husbands back their sweats….” Position in the class was another behavior the GFI’s associated with increased confidence; instructors noted that women new to ST classes typically stand in the back of the class, and gravitated closer to the front as they became more skilled in exercise techniques.

Perceived Risks of Strength Training

ST activities were associated with the perceived risk of physical injury. Both groups related the risk of injury while ST to a lack of knowledge and subsequent poor technique and form. ST women also identified “overwork,” as a perceived risk of ST; “take your rest days” and “listen to your body” were cited as techniques to avoid excessive muscle soreness. The importance of education and observation of the GFI was discussed by a number of women.
Participants indicated a desire for a GFI that stressed proper technique by demonstration and verbal messages, as well as individual attention when needed to correct exercise form.

Several NST and ST women described the perception that ST causes women bulk up as a risk of ST. Several women who engage in ST speculated that a fear of bulking up might be the reason NST women avoid ST. One NST woman emphatically stated a belief that bulking up is a risk of ST, and she did not want to bulk up.

GFI Observations of Women’s Perceived Risks of ST

As mentioned previously, the GFI sample reported a strong focus on injury prevention in class, which is in alignment with the group fitness participants’ perception that injury is the risk most often associated with ST activities. Responses from the GFI sample about their interactions with students regarding exercise instruction further supported the group fitness participants’ concerns about injury. Several GFI’s responded to the question with a comparison of women to men; women in group fitness classes frequently ask more questions than men about technique and form, more readily express concerns about “getting hurt,” and will typically achieve competence in a skill before the amount of weight used to perform the exercise is increased.

Attitudes Toward Bulking Up, Lifting Light, and Getting Bigger

The ST and NST participants were read a statement about common beliefs regarding women bulking up, or developing a masculine appearance as a result of ST. Following the narrative, the participants were asked how concerned a woman participating in a twice-a-week group fitness ST class should be about bulking up. Both groups indicated a belief that bulking up should not be a concern; women cannot bulk up under these circumstances. The participants agreed that a woman could bulk up, though, if that is her goal. To achieve that result, a highly regimented training and nutrition program, which may also include substances such as anabolic steroids, is required, according to the participants.
Lifting Light

Lifting light, a strategy some women believe will prevent bulking up, was described to the participants. Following the description, they were asked if they had heard of lifting light. If they had heard of the strategy, they were asked for further details. Twenty-one of the 24 participants had heard of the strategy under various circumstances. Several had heard or read about the strategy in popular consumer-oriented media, and others were given this advice by fitness professionals, athletic coaches, or friends. No ST women reported adhering to the strategy; several indicated their current GFI taught them otherwise. The following ST woman’s response demonstrates the GFI’s role in ST education: “The instructor says that you can lift more than you think you can, which is always important to hear, and I believe it, and it works.”

Three NST women agreed with the advice. The six other NST and ST participants asserted a general attitude that, by lifting light, a woman is “cheating herself” out of potential benefits, and that lifting light is an inefficient strategy. A NST woman with a previous ST participation questioned reasons for lifting light: “maybe they had something that happened to them previously…or they don't have the self confidence…if they're primarily doing it because of that stigma then – they may have to question why they are strength training at all.”

Getting Bigger

The participants were read a third statement and asked for their response to a hypothetical situation in which a friend or family member told them their arm or leg muscles were getting bigger. “Bigger” was specifically used in the wording of the question. With little variation, the NST and ST women replied they would interpret this as a positive observation. However, a few ST and most NST women seemed to indicate in responses to other interview questions that becoming overly muscular was a personal concern; they expressed a desire to “do just enough (ST) to tone.” One NST participant stated she would “freak out” and worry if she was eating too much if told that she was getting bigger arm or leg muscles. Several ST women described actual comments about their increased muscle mass from friends or relatives. Two women stated remarks regarding getting bigger were delivered within the
context of a warning; “if you continue ST, you will look like a man.” Both women indicated they were not deterred from ST by the comments; one attributed her family’s remarks to cultural practices:

Typical Hispanic families; they always want to point out, “Oh you are doing this, oh you are doing that.” I just laugh about it, and I just say, “You know what, that’s how I want to look, that’s my goal and might not be yours, but it makes me feel good about myself.”

As stated, the women in the current study reported they would interpret statements about bigger arms or legs as an affirmative recognition of their efforts. This attitude was conveyed by ST and NST women; getting bigger is “a good thing.”

**GFI Responses to Concerns about Lifting Light and Getting Bigger**

The GFI sample was asked about their observations regarding women’s fears of bulking up; they reported that bulking up is a very common fear among women who are new to ST. Four of the instructors stated that to dispel the belief that ST will cause a woman to bulk up, they instructed students to “look at other women in the class,” or to look at the female GFI. They believed direct observation of ST women validated their verbal assertion that women do not bulk up as a result of routine ST.

One GFI believed the concept of “lifting light” was falling out of practice, yet she perceived “most women underestimate their abilities,” and observed women “go for the lighter weight every time,” when selecting a weight or kettlebell to use in class. Four other GFI’s reported observing this practice in their classes; many women select lighter weights than they are capable of lifting.

The influence of friends and family was explored with the GFI sample. The GFI’s observed in their students that family support was important, but not essential. Several examples of women who maintained a commitment to ST, despite discouraging remarks from spouses and family members, illustrated this concept.

**ST WOMEN’S MOTIVATION TO STRENGTH TRAIN**

The positive feelings that ST activities elicited were the primary motivation to continue the activity, according to the ST women in the current study.
“I Was Hooked”

Several women used the term, “I was hooked,” to describe their initial response to ST class participation; they enjoyed the activity from the onset and continued to perceive the same level of value and pleasure, months and years following their first classes. The physical and emotional responses generated in the ST class motivated the women to return and to challenge themselves by increasing the amount of weight and/or the amount and type of ST classes they participated in. Not all ST participants were immediately motivated to start ST regularly. One participant revealed, “nine months ago, it would have been different than it is today. So, I started out by default and I continue by choice, because I like the way it makes me feel, I like the benefits…” Her explanation of continued motivation to ST reflects similar attitudes expressed by other ST participants: “I know that it has improved my appearance, but it is how it makes me feel. I actually feel better, I feel stronger, I feel positive, and I feel like I want to pass that on to other people.”

Physical Appearance

Appearance was closely associated with motivation to ST. A desire to look better in clothes was a prime stimulus for several women, including this fifty-one year old ST: “…if I'm going to wear a dress and I'm not strength training and all I'm doing is walking….I want that definition in my calves, so it does give you definition in your muscles and I like that look.” One participant discussed age-related appearance changes, and hoped that ST would improve or resolve the “old woman back thing” that disturbed her. A thirty-six year old active duty military ST participant reported she perceived that ST resulted in “firmer or shapelier” attributes that enhanced her femininity; several other ST participants suggested similar attitudes.

Motivation from the Group Environment

Observing what ST did for similar others was motivating for some ST women. An atmosphere of “friendly competition,” experienced in a supportive setting in which the women could challenge themselves was perceived as a facilitator to motivation. At least seven ST women described situations in which they had observed classmates who were
lifting heavier weights, or were older than they were and outperforming the women. In both situations, the women were spurred either to finish the workout if they were struggling, or to consider using a heavier weight. Several women perceived verbal encouragement the students gave to each other during class as motivating. One ST woman considered the group setting essential to her motivation: “I don't know that that I would even be qualified (to participate in the current study) if I was in a different setting; I mean, would I have continued it? The setting has helped a lot.”

**Self-Care**

“Taking care of myself” was a recurring theme that motivated many ST women in the current study. Maintaining health and preventing disease figured prominently for several women who knew someone with preventable conditions such as diabetes and heart disease. Other participants alluded to taking care of themselves on a more abstract level; one woman traced her motivation to participate in ST because she perceived ST helped to produce “an aura about you, a glowing...when your outside reflects your inside….I’m taking care of my temple...you get one, so (you) better take care of it.”

**Emotional Motivation**

Two general attitudes were expressed with regard to being a woman who strength trains. The concept of “being strong feels good,” articulated by one of the ST participants, was re-stated in similar expressions by other participants throughout the course of the individual interviews. One participant described feeling “empowered,” by the strength gains that accompany ST, and another noted, “how you look at everything changes” when you’re stronger. The ST women also described an outlook that was conceptualized as “it’s okay to be strong and feminine.”

**Motivation: The GFI Perspective**

The motivation that resulted from friendly competition was emphasized by several GFI’s. A female GFI observed, “…we look at each other: “Oh I wanna be strong like her.” She recalled her own group fitness participant experiences:
When I first started, there was a girl…pressing and moving at least three times the weight I was, and I thought, “Oh, wow, I wanna get like that.” And I’ve heard other ladies…“You know I saw you, and I want to do that,” and so we more inspire in a competitive way, or, it’s more inspirational, than, you know, flat out competition. Another female GFI believed the group setting is usually necessary for student motivation; “most people need to have that group setting to push them and the people that are stronger in there will actually push them.” She discussed her perspective as an instructor: “…working with group settings is much more motivating and enjoyable, especially as an instructor.”

A male GFI endorsed the ST women’s concept of “it’s okay to be strong and feminine.” He had 15 years’ experience teaching ST classes and described an attitude shift he observed in his classes. He stated he was glad that a long-standing belief that women who ST would “end up like Arnold Schwarzenegger’s little sister,” had been replaced with an attitude he summarized as, “I can work hard and still be girly-girl.”

**Barriers to Strength Training**

Women who did not ST were asked to describe what prevented them from participating. Four of the nine NST participants had previously participated in individual and/or group ST activities more than one year prior to the study participation. Two of these women indicated they “missed it terribly” and were not currently ST due to competing obligations, such as work and children’s activities. The other two prior ST participants did not state any perceived barriers; one had recently attended a ST class and indicated she would like ST again, but did not clearly define what had prevented her from ST in the interim. The fourth former ST participant described the perceived social, physical and emotional benefits she obtained from Zumba participation, and stated she had “just been having so much fun with it” for the past year-and-a-half.

**Fear**

The NST women who did not have any historical ST experience expressed fear as a barrier in several contexts. Two NST women expressed a fear of getting bulky, which they had perceived as an outcome of ST. Fear of injury or pain figured prominently for three women. A wedding coordinator indicated fear of not be able to work if she were to perform a
ST technique incorrectly was foremost in her mind: “If something were to happen to me…that I couldn't be there for a bride…I would freak out….what if I pull a muscle, what if I hurt my back, what…” A NST woman with two young children and a Marine husband had attempted ST in the past, and found she was unable to participate in classes regularly due to her husband’s erratic schedule and childcare difficulties. She indicated the pain and muscle soreness that she experienced from sporadic ST was intolerable. She preferred to attend Zumba because she had not experienced muscle pain and soreness as a result of sporadic Zumba class attendance. Another NST woman, also married to a Marine, stated she was afraid of the pain she perceived as accompanying ST, particularly because she had “small arms.”

Lack of Knowledge

Several women described a fear of weights, related to inexperience and lack of knowledge. One NST woman who has hand-held weights at home stated, “…at home I have a few weights…what do I do with these things? I’m afraid of the weights; I don’t know what to do with them.” Lack of knowledge of ST techniques and benefits was perceived as a barrier for five NST women in the current study. A woman who described a lack of knowledge as a barrier perceived attending a ST class to gain knowledge as overwhelming:

I'm just kind of scared to go to a class like that. And I don't know if I can overcome it in the class. So I won't enter the class yet because I don't know what to expect out of it.

The GFI’s described observations that lent support to the concept of fear as a barrier to ST; women who were new to ST classes were described as “fearful” or “afraid.” The primary fear most new female students had was that they will “look foolish,” and they perceived “everyone is watching them,” according to one GFI. “Intimidation” and a belief “that they can’t keep up or that it’s too hard or that they won’t know the skill set” were barriers described by another GFI.

Quantitative Data Results

The following section describes results of the strength and aerobic conditioning questionnaire, a brief tool designed to measure participants’ knowledge of current physical
activity guidelines. Results of the statistical analysis for other quantitative data collected are also presented in this section.

**FITNESS QUIZ**

The mean number of correct responses for the 15-item Fitness Quiz was 9.19 (SD 2.20) for the NST group, and 11.19 (SD=1.98) for the ST group. The item most often answered incorrectly was a true or false statement that falsely asserted it is possible to reduce fat in targeted areas, such as the hips or thighs. The percent of participants who correctly selected the “false” option, and indicated it is not possible to spot reduce in specific areas, was 32.08% (SD=0.47).

Ebben and Jensen (1998) described three myths related to women and ST: (1) strength training causes women to become larger and heavier, (2) women should use different training methods than men, and (3) women should avoid high-intensity or high-load activities. All group fitness participants in the current study were asked three true or false questions, using the same wording (Ebben & Jensen, 1998). Responses to the three questions indicated that the study participants were knowledgeable about two of the three misconceptions. In response to the item “strength training will cause women to become larger and bulk up,” 88.68% (SD=0.32) participants correctly identified the statement as false. Forty-six participants (86.79%, SD=0.34) correctly identified the statement: “women should avoid high-intensity or high-load training” as false. However, “Women should use different training methods than men,” was correctly identified as a false statement by 39.62% (SD=0.49) of all participants.

Almost all participants (94.34%, SD=0.23) correctly identified the following false statement: Building muscle mass will make it more difficult to lose weight, by slowing one’s metabolism. Forty-nine participants (92.45%, SD=0.26) correctly indicated that the most effective exercise program is one that combines aerobic and strengthening activities.
CORRELATES OF SELF-DETERMINATION, MUSCULAR DEVELOPMENT MOTIVES, STRENGTH AND AEROBIC CONDITIONING KNOWLEDGE, AND CHANGE STRATEGIES BETWEEN NST AND ST PARTICIPANTS

Correlations between the BREQ-2, MDS, Fitness Quiz, and Change Strategies surveys completed by group fitness participants were conducted. Results are located in Table 3. An alpha value of p=0.05 was used for all statistical tests. The strongest positive relationship was observed between MDS/appearance and MDS/weight management motives (r=0.63). Participants who indicated an increased appearance motive for exercise (“I exercise to look more attractive”) demonstrated increased weight management motives (“I exercise to control my weight”) as well. Moderate positive relationships were observed between the BREQ-2 identified regulation and intrinsic regulation (r=0.41), use of change strategies (r=0.47), MDS/weight management motives (r=0.32), and MDS/appearance motives (r=0.36). Participants who were motivated to exercise by the value they placed on the outcome, such as improved health, were also more likely to name intrinsic (“I exercise because it’s fun”) reasons for exercise. Likewise, participants who reported an identified motivation for exercise were likely to employ greater use of the change strategies (“I think about the benefits I will get from being physically active”) to maintain their behaviors, and report weight management and appearance over muscularity motives.

Among the BREQ-2 subscales, a moderate positive relationship was observed between the BREQ-2 external regulation (“I exercise because other people say I should”) and introjected regulation (“I feel guilty if I don’t exercise”) subscales (r=0.33). Participants who indicated they were motivated to exercise more due to the influence of rewards or threats also indicated they likely exercised to avoid feeling of guilt or to please others. Moderate positive relationships were also demonstrated between the MDS/muscularity and MDS/appearance motives (r=0.34) and use of change strategies (r=0.39). Participants who indicated increased muscularity exercise motives (“I exercise to become strong and powerful”) were motivated by appearance factors as well, and were apt to use change strategies to maintain their behavior.
Table 3. Correlation between NST and ST Groups on Relative Autonomy, Motivation Regulation, Muscular Development Motives, Change Strategies, and Strength and Aerobic Conditioning Knowledge

<table>
<thead>
<tr>
<th>Survey Instrument</th>
<th>BREQ-2(^1)/Amotivation</th>
<th>BREQ-2/External</th>
<th>BREQ-2/Introjected</th>
<th>BREQ-2/Identified</th>
<th>BREQ-2/Intrinsic</th>
<th>MDS(^2)/Muscularity</th>
<th>MDS/Weight</th>
<th>MDS/Appearance</th>
<th>Change Strategy(^3)</th>
<th>FQ(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREQ-2/Amotivation</td>
<td>1</td>
<td>0.29</td>
<td>-0.01</td>
<td>-0.11</td>
<td>-0.29</td>
<td>-0.04</td>
<td>0.21</td>
<td>0.13</td>
<td>-0.29</td>
<td>-0.18</td>
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<td>-0.15</td>
<td>-0.46</td>
<td>-0.16</td>
<td>0.06</td>
<td>-0.04</td>
<td>-0.13</td>
<td>0.01</td>
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</tr>
<tr>
<td>BREQ-2/Introjected</td>
<td>1</td>
<td>0.21</td>
<td>-0.21</td>
<td>0.08</td>
<td>0.18</td>
<td>0.16</td>
<td>0.09</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BREQ-2/Identified</td>
<td>1</td>
<td>0.41</td>
<td>0.28</td>
<td>0.32</td>
<td>0.36</td>
<td>0.47</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BREQ-2/Intrinsic</td>
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<td>0.16</td>
<td>-0.08</td>
<td>0.08</td>
<td>0.25</td>
<td>0.09</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>MDS/Muscularity</td>
<td></td>
<td>1</td>
<td>0.22</td>
<td>0.34</td>
<td>0.39</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDS/Weight</td>
<td></td>
<td>1</td>
<td>0.63</td>
<td>0.25</td>
<td>-0.11</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MDS/Appearance</td>
<td></td>
<td>1</td>
<td>0.22</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Change Strategy</td>
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<td>FQ</td>
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<td></td>
<td>1</td>
</tr>
</tbody>
</table>

\(^1\) BREQ-2 subscale scores; calculated by averaging the individual BREQ-2 items that corresponded to each of the subscales (e.g., amotivation items were 5, 9, 12, and 19).

\(^2\) Muscular Development Scale; consists of three subscales, appearance, weight management or muscular development. Subscale scores calculated by obtaining the mean for each of the three subareas. The subgroup with the highest mean provided an indication of the participant’s strongest exercise motive – appearance, weight management or muscular development.

\(^3\) A composite Change Strategies score was created by calculating the mean of items 1 to 15. A higher composite strategy score indicated greater use of the Processes of Change.

\(^4\) Fitness Quiz; individual scores were obtained by dividing the number of correct responses by the total number of items, and multiplying by 100, to determine a percentage score on a scale of 0-100\%.
Weak positive relationships were noted between the BREQ-2 amotivation and external regulation subscales (r=0.29); this indicates a mild association between a lack of motivation to exercise, which may be due to a lack of competence, or a lack of perceived value in the behavior, and being motivated by external influences when exercise does occur. The BREQ-2 identified regulation subscale and the MDS/muscularity motive (r=0.28) also demonstrated a weak positive association; participants who were motivated by the value they placed on the outcome of their exercise behavior also reported muscular motives for exercise.

Weak negative associations were observed between the BREQ-2 amotivation and BREQ-2 intrinsic regulation subscales and change strategies scale (r=-0.29 for both). Participants who reported increased intrinsic motivations and use of change strategies were less like to indicate a lack of motivation to exercise. Lastly, a moderate negative relationship was noted between the BREQ-2 external and intrinsic regulation subscales (r=-0.46). This may be an indication that as motivation for exercise becomes more self-determined, participation based on rewards or threats becomes a less prominent regulator of behavior. No additional associations were observed among the BREQ-2, MDS, Fitness Quiz, and Change Strategies surveys responses.

**DIFFERENCES IN SELF-DETERMINATION, MUSCULAR DEVELOPMENT MOTIVES, AND CHANGE STRATEGIES BETWEEN NST AND ST PARTICIPANTS**

Mann-Whitney tests were conducted to evaluate differences in responses to the questions on each scale administered: BREQ-2, MDS subscales, Change Strategies, and the Fitness Quiz. Test statistic interpretation included evaluation of the probability (p) value. The results of the tests are reported in Table 4.

With a significance level set at p < =0.05, statistical test results supported the null hypothesis (H₀: there is no difference between the two groups) on the five BREQ-2 behavioral regulation subscales, MDS/appearance and weight management motives, and Change Strategies measures. The indicates that there were no significant differences observed between NST and ST participants with regard to their reported motivations for exercise, appearance and weight management motives for exercise, and their reported use of the Change Strategies to maintain their exercise behavior.
Table 4. Differences between NST and ST Groups on Relative Autonomy, Behavioral Regulation, Muscular Development Motives, Change Strategies, and Strength and Aerobic Conditioning Knowledge

<table>
<thead>
<tr>
<th>Instrument</th>
<th>NST (n=16)</th>
<th>ST (n=37)</th>
<th>Mann-Whitney test/ P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>BREQ-2/Amotivation$^e$</td>
<td>0.13</td>
<td>0.35</td>
<td>0.08</td>
</tr>
<tr>
<td>BREQ-2/External</td>
<td>0.53</td>
<td>0.82</td>
<td>0.18</td>
</tr>
<tr>
<td>BREQ-2/Introjected</td>
<td>1.94</td>
<td>1.08</td>
<td>1.69</td>
</tr>
<tr>
<td>BREQ-2/Identified</td>
<td>3.42</td>
<td>0.55</td>
<td>3.49</td>
</tr>
<tr>
<td>BREQ-2/Intrinsic</td>
<td>3.56</td>
<td>0.66</td>
<td>3.54</td>
</tr>
<tr>
<td>MDS/Muscularity$^f$</td>
<td>2.09</td>
<td>0.74</td>
<td>3.15</td>
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<tr>
<td>MDS/Weight</td>
<td>4.13</td>
<td>1.23</td>
<td>3.76</td>
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<tr>
<td>MDS/Appearance</td>
<td>3.31</td>
<td>1.01</td>
<td>3.38</td>
</tr>
<tr>
<td>Change Strategies$^g$</td>
<td>3.36</td>
<td>0.53</td>
<td>3.60</td>
</tr>
<tr>
<td>Fitness Quiz$^h$</td>
<td>9.19</td>
<td>2.20</td>
<td>11.19</td>
</tr>
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</table>

Results were below the significance level of p <=0.05 in two areas. Differences were observed between NST and ST participants on the MDS/muscularity subscale (p<0.001) and Fitness Quiz (p=0.004). This indicates a significant difference exists in ST and NST participants’ motives for muscularity and their knowledge levels of strength and aerobic conditioning, as assessed by the Fitness Quiz.
CHAPTER 4

DISCUSSION

Less than one in five adult women in the U. S. engages in the minimum recommended rate of ST activities two or more days a week (Garber et al., 2011; Health Indicators Warehouse, 2011). Women benefit from a fitness program that incorporates routine ST in the same manner as men, and the ST routines, exercises, and intensities should mirror that of men, considering experience level and certain pre-existing conditions, such as cardiac disease, for both genders (Garber et al., 2011; Ratamess et al., 2009). ST is an efficacious, safe, and crucial activity, and it should be a fundamental component of essentially every woman’s physical activity.

A number of studies have examined variables associated with women’s participation in aerobic physical activity (Caperchoine et al., 2009; D’Abundo, 2009; Eves et al., 2003; King et al., 2000; Martin et al., 2007; Speck & Harrell, 2003). Research on women’s participation in strength training activities has increased over the last decade. Gender disparities regarding the use of ST exercise machines and fitness center weight rooms have been the focus of several studies (Brace-Govan, 2004; Dworkin, 2001, 2003; Haines et al., 2008; Salvatore & Marecek, 2010). Some studies have focused on older women’s attitudes, beliefs and behaviors regarding participation in ST activities, while other studies targeted college-age women (Bopp et al., 2004; Fetherman et al., 2011; Harne & Bixby, 2005; Haines et al., 2008). Investigators have examined factors associated with adult women’s participation in ST in a group setting (O’Dougherty et al., 2008; Surakka et al., 2004). Other than work by Dworkin (2001), Brace-Govan (2004), and Harne and Bixby (2005) though, much of the previous research has focused on women who were not current ST participants.

The present study approached the topic of women and ST from the perspective of women who were already involved in routine exercise; the participants were women who met, and often exceeded, national recommendations for aerobic and/or strengthening activities. Additionally, the sample was comprised of mid-life adult women, ages 30 – 59 years; relatively few studies have examined ST participation by women in this stage of life.
O’Dougherty and colleagues (2008) conducted a randomized, controlled ST program intervention with women ages 25-44 years old; participants in that study did not meet national recommendations for physical activity prior to enrollment, though.

The findings from the current study generally support previous research on women’s participation in strength training activities with regard to knowledge of benefits and techniques, barriers and facilitators. ST from the perspective of group fitness participation has not been extensively studied. Findings from the current study did generally support previous group fitness studies with regard to the potential influence of the instructor on adherence and group cohesion, relevant instruction provided during class, and the instructor’s role in supporting feelings of competence and relatedness (Burke et al., 2006; D’Abundo, 2007; Estabrooks et al, 2004; Ryan & Deci, 2000b).

**Knowledge and Beliefs Regarding Strength Training**

In 1998, Ebben and Jensen named three mistaken beliefs that either prevented women from participating in ST, or prevented them from achieving optimal ST benefits. The misconceptions were as follows: (1) strength training causes women to become larger and heavier, (2) women should use different training methods than men, and (3) women should avoid high-intensity or high-load activities. The current study considered these assertions, and contemplated to what extent those misconceptions were still valid, more than a decade after publication of Ebben and Jensen’s (1998) article. As reported in a preceding section, the majority of participants demonstrated knowledge that strength training will not cause them to become larger and heavier, and that women should not avoid high-intensity or high-load activities. Far fewer women recognized that women should use the same training methods as men. It is noteworthy to mention that many of the ST women in the current study attended ST classes that were largely composed of women.

The Fitness Quiz item missed most often, a false statement regarding targeting body areas for selective reduction, was substantiated as a common mistaken belief by one the GFI’s. A female GFI succinctly described her encounters with group fitness participants who believe it is possible to target certain areas of the body for reducing body fat or increasing
muscle mass: “So, people will want to come to us and get rid of a specific spot on their body and that’s not really possible.”

The qualitative data were generally consistent with the Fitness Quiz responses corresponding to the three mistaken beliefs Ebben and Jensen (1998) put forward. When women in the current study were asked about bulking up, the majority asserted a belief that this was not possible under normal strength training circumstances. However, a majority of the NST and a few ST participants did describe the practice of “doing just enough to tone,” which may have a relationship to the previously stated misconceptions. One ST woman’s description of “doing just enough to tone” follows: “a couple of reps and it’s just enough to keep your muscles...to get them to tone up...I don’t do heavy weights. I think heavy weights will bulk you up.” She indicated a belief that she will bulk up and therefore, avoids high-load training.

Gender differences in training programs was not a specific interview topic, and it is not possible to speculate whether interview comments describing women as equally capable as men in ST activities were signs of a discrepancy between the Fitness Quiz results that revealed the majority believed women should strength train differently than men. Four ST women who participated in interviews primarily attended a mixed gender ST class; gender-differentiation in ST programs did not arise as a topic during interviews with any participant. One participant mentioned a phenomenon in which the men in her class perceive a need to select a heavier weight than is appropriate for the type of training involved, prompting cues from her and the GFI regarding appropriate weight selection.

Haines et al. (2008) demonstrated the importance and effect of education on women’s participation in ST in a study conducted in a university setting. A 16-question quiz, similar to the one used in the current study, was administered to participants before and after a strength training education intervention. The average correct score pre-intervention was 10.4 out of 16 (65%); following a brief ST education program, the number of correct answers was 14.88 out of 16 (93%) (Haines et al., 2008). While the differences in the current study’s quiz results are cross-sectional and reflect a modest difference in percent correct between NST and ST groups (61.27% versus 74.6% correct), the results suggest that in this sample, ST women may be somewhat more knowledgeable about general ST and aerobic conditioning concepts than NST women may.
ATTITUDES TOWARD STRENGTH TRAINING

In the current study, women who ST generally perceived strength training as an activity that positively affected their appearance and overall sense of well-being. Women who did not ST attributed similar positive outcomes to ST. This finding is consistent with Harne and Bixby’s (2005) research with college-age women on their perceptions of strength training; in this study, young women who engaged in ST were compared to a group of young women who did not ST. Both groups in that study reported similar perceived psychological, body image and health benefits, and viewed ST as an important contributor to looking and feeling good about oneself (Harne & Bixby, 2005).

“It’s okay to have muscle and still be feminine,” a stance asserted by many of the ST women in the current study, is similar to the attitudes and perceptions about ST reported in studies conducted with young women who regularly engage in ST activities (Brace-Govan, 2004; Krane et al., 2004). Krane et al. (2004) specifically addressed concepts of femininity and muscularity in a small sample (n=21) of female university varsity athletes; participants presented concerns about becoming overly muscular and a resultant loss of femininity. Attitudes toward excess musculature may affect all age groups and levels of ST participation. In studies with older women who did not ST, participants reported negative responses to the increased muscle mass and feared noticeable muscular development and “looking like a man” (Bopp et al., 2004, p. 12; Khoury-Murphy & Murphy (1992). In contrast, although women acknowledged the possibility of becoming overly muscular in the current study, the majority perceived that ST enhanced their femininity, rather than detracted from it. The ST women welcomed the appearance changes they associated with increased muscle mass and definition. This difference in attitude may be related to a distinction between the “everyday women” in the current study, who ST significantly less and for different primary outcomes than the student athletes in the Krane et al. (2004) study.

CHARACTERISTICS OF A STRENGTH TRAINER

A number of studies have looked at various individual attributes and their relationship to participation in physical activity (Arikawa et al., 2011; Chevan, 2008; Kathrins & Turbow, 2010; Mullan et al., 1997). Kathrins and Turbow (2010) concluded demographic characteristics did not necessarily predict frequency and amount of ST participation in a
recent mixed gender study of group fitness participants’ (n=185) motivation to ST. In contrast, Arikawa et al. (2011) reported significant differences with regard to race and family status in adherence to a women’s ST intervention; white women and married women with children five years of age and younger were more adherent than women of color and unmarried women with children 13 years or older. An interesting finding in the Arikawa et al. (2011) study was a significant inverse relationship between educational level and adherence; participation in strength training activities has generally been associated with higher levels of education. In the current study, 10 of the 16 NST women and 27 of the 37 ST women had a college degree (associate’s or higher); all participants had a minimum of a high school diploma.

Published studies that specifically explored personality traits associated with adult women who ST regularly could not be located. However, Ingledew, Markland, and Sheppard (2004), examined relationships between personality and self-determination of exercise behavior. In a sample of 182 fitness center participants who were in the maintenance stage of exercise, personality was related to the distinct forms of behavioral regulation (Ingledew et al., 2004). In the current study, participants were asked to describe the type of person who strength trains. The responses ranged from a stated absence of type (“I don’t have a type, per se”), to specific adjectives and attributes that might be associated with a person who strength trains (“confident;” “healthy”), to individuals known to the participant (“me;” “A Marine;” “my husband;” “the Zumba and Spin instructors”). The primary researcher’s interpretation of the individual responses led to a composite image of an individual who strength trains. The concept that “while anybody can strength train, not everyone does,” emerged. The premise that followed is “those that do strength train are distinctive; they can be identified by certain characteristics.” The participants’ composite of an individual who strength trains is someone who is confident, internally motivated, and committed not only to their appearance, but to personal health and well-being as well.

**GROUP FITNESS INSTRUCTORS’ PERSPECTIVES**

In the group fitness setting, the instructor is a pivotal element in the participants’ immediate experience and their continued involvement. In a number of studies, the scope of the GFI’s influence has been demonstrated to extend beyond simply teaching exercise
techniques (D’Abundo, 2007, 2009; Greenleaf et al., 2006; O’Dougherty et al., 2008). The GFI may help shape participants’ self-efficacy and competency beliefs, impact body-image perceptions, influence diet and other lifestyle choices, and provide much needed social support to participants. Estabrooks et al. (2004) maintained that recent conflicting evidence regarding the degree of GFI influence, particularly on participant adherence, has been confounded by lack of methodological and operational definition consistency.

While much of the previous exercise motivation research has focused on group fitness participant perceptions of the GFI, the current study sought to integrate the experiences of group fitness participants with the observations of their instructors. NST and ST women were asked one question regarding the GFI’s discussion of ST during class, and concepts related to the influence of the GFI emerged naturally throughout the course of their interviews. GFI interview data were applied primarily to confirm/disconfirm and expand upon the group fitness participants’ information.

As discussed in an earlier section, the instructor responses lent support to and enriched the group fitness participant qualitative data. The instructors provided rich descriptions of their experiences with and observations of women and ST. Additionally, the GFI’s provided information that hinted at the complexities surrounding the topic of women and strength training. The GFI suggestion that many women embark on an emotional journey while participating in ST and their observations on a relationship between diet and ST participation were two topics that surfaced during the interview process. It is not clear what, if any, relationship exists between women’s dietary habits and participation in ST in the current study, but given the number of the group fitness participants who also mentioned struggles with diet and eating, there may well be a relationship.

**LIMITATIONS**

There were several limitations to the present study. Concerns with the methodology included self-reported data for all measures, which carries the potential for socially desirable answers instead of an accurate assessment of activities, attitudes, beliefs, and perceptions. Inclusion criteria for the group fitness participants required a minimum of six months’ exercise experience in strength and/or aerobic group fitness classes. While this ensured all participants were in the maintenance stage of change with regard to general physical activity
participation in a group fitness setting, equivalent exploration of women’s experiences with long term ST was not possible using this approach. This limitation might have been reduced or eliminated if the current study compared women who strength train in a group fitness setting with women who strength train individually, or compared two age groups of ST women. Another limitation was the sample size; the final sample size was smaller than planned. Attempts were made to achieve statistically significant sample sizes from a mixed methods perspective. The sample was achieved through a single investigator employing purposeful, snowball, and convenience-sampling methods, which are common approaches in qualitative data collection, but presented challenges in achieving the desired quantitative sample size.

The sample was comprised of well-educated, physically active women between the ages of 30 and 59 years, which prevent generalizing results to other populations. A comparison of women who pay for group fitness classes with women who attend free classes was considered. Formative research was conducted using the Internet to locate local programs that offered ongoing free group fitness classes using the following key words: free, fitness, exercise, class, group, and San Diego. The initial search in November 2011 identified one twice-weekly free adult fitness class, offered at a city recreation center through the department of parks and recreation, and a weekly free aerobics (Zumba©) class, offered at three local public libraries. The class schedule and locations were changed during the recruiting phase of the current study, and subsequently, the researcher was unable to visit the sites to recruit participants. The researcher attended two free aerobic exercise classes conducted as part of a university-sponsored physical activity intervention; no potential participants were identified at either session. No ongoing free group ST classes were located using the key words noted above and the following additional key words: strength, resistance, and training. A search performed on a social networking site (Meet-up) using all of the keywords resulted in one on-going free Cross-Fit© strength and conditioning type class, offered at a local park by an instructor who is employed by a private fitness center. It was determined that the complimentary class was similar to marketing efforts designed to allow consumers to try a gym membership before purchasing.

Selection bias was another possible limitation to this study. The majority of the study participants were women known to be group fitness participants by the primary researcher
prior to the study. It is possible that these women were more likely to participate than women who did not identify the primary researcher as a fellow group fitness participant. This is a potential explanation for the disparity in the sample sizes between the ST and NST groups; the primary researcher had attended significantly more strength training than aerobics classes in the months prior to the present study, and it is possible that women who visually recognized her were more receptive to recruiting efforts. The researcher’s prior knowledge of the research topic and some of the participants increased the potential for interviewer bias (Creswell & Clark, 2007).

Regarding measurement limitations, the current study’s primary author developed an assessment tool for participants’ knowledge of strength and aerobic conditioning facts (Fitness Quiz) after an extensive Internet search indicated there were no similar pre-existing tools. Although the questions were reviewed by a subject matter expert, the survey was not pretested by members of the target audience. Several participants commented on the Fitness Quiz at the time of completion; a NST participant stated she “really had to think about some of these.” The Physical Activity Change Strategies questionnaire also presented measurement limitations; the questionnaire was designed for measuring the processes used in general physical activity behavior, and was not specific to strength training. The modified version the current study used did not differentiate among the experiential and behavioral processes participants may have employed, which would have provided valuable information for additional exploration between group relationships and has been promoted by other researchers (Fallon, Hasenblas, & Nigg, 2005; Marshall & Biddle, 2001). Studies that used the full-length questionnaire analyzed the 10 distinct processes separately and compared the degree to which each strategy was used and in comparison to other variables, such as the stage of change the respondent was in at the time (Fallon et al., 2005). Data analysis limitations also exist. Quantitative data collected from participants were manually entered into a computer database for further analysis. The possibility exists that entry error could result in inaccurate findings. Transcription errors due to inaudible and indiscernible audio content could result in qualitative data misinterpretation. Finally, the potential for research bias existed as a single researcher coded the qualitative data (Corbin & Strauss, 2008).
IMPLICATIONS FOR THEORY

The current study framed the topic, women and strength training, in constructs of Self Determination Theory (SDT) and the Transtheoretical Model (TTM). SDT is a comprehensive model that explains motivation and has been tested extensively with demonstrated validity in physical activity contexts with numerous populations (Hagger & Chatzisarantis, 2007). Findings from the current study uphold the SDT’s assertion of the need for competence, autonomy, and relatedness to support motivation. As the purpose of the study was primarily to examine ST women’s experiences with ST, the following paragraphs focus mainly on the theoretical alignments observed in that group.

Qualitative data collected in the current study suggested that the ST participants greater perceived competence, autonomy, and relatedness than did the NST participants. Achieving competence was reflected in one ST woman’s discussion of how she, like many other women, viewed ST before she started participating in a ST class: “…we don’t think that we are strong enough to do it. I know that was my fear initially as -- I can't lift that.” She then described feeling confident and capable, several months later: “…and then the instructor saying, ‘yes you can do it. Why can't you try it, see it.’ And it was like, “oh yeah, yes I can.” Other ST participants discussed how competence in ST impacted other areas of their lives: “…after I work out…I can tackle my day whatever comes my way;” “I like being able to do things that you know people your age can’t do or don’t want to do.” The essence of autonomy, though, was captured by the ST woman who, when asked why she strength trained, replied, “It’s my time, my moment.” Although both groups of participants emphasized they felt a sense of relatedness in their respective group fitness classes, the ST participants described more authentic interpersonal interactions and a greater sense of connection others; this group overwhelmingly stated their relationship with the instructor was a key reason they enjoyed their fitness class.

The co-existence of extrinsic and intrinsic motivations to exercise was also substantiated in both groups. Again, the ST participants provided rich, detailed narratives that illustrated both the rewards or outcomes, such as improved appearance, and their sheer enjoyment of the activity. The concept that the improved sense of well-being that accompanied ST was as central to their participation as appearance-related outcomes was clearly characterized by most of the ST participants.
As discussed previously, the TTM has been used to explain concepts associated with behavior change processes for a wide range of activities, including exercise (Pekmezi et al., 2010). Women in the current study were in the maintenance stage of the TTM’s Stages of Change, which allowed for an exploration of how individuals in this stage applied change strategies to maintain their exercise behavior. Support for the Processes of Change constructs of counter-conditioning, helping relationships, reinforcement management, and stimulus control was vividly described during interviews with the ST participants (Pekmezi et al., 2010; Prochaska & DiClemente, 1982). Counter-conditioning strategies were more often described as the processes participants employed at a time during their fitness class when they did not feel they wanted to give their full effort to the workout. Most did not describe a need to utilize strategies to substitute exercise for a less healthy behavior; the participants in the current study reported looking forward to their workouts, and did not express a need to motivate themselves to exercise. For example, a ST woman described choosing a heavier weight to exercise with, in spite of not wanting to “work hard” during a class; “…you know, after you’ve pushed yourself harder, you feel really good that you lifted 10 pounds more than you thought you could.”

Employing helping relationships, another Process of Change strategy, was common practice for ST participants who described the rapport and support established with their instructor and fellow students. Reinforcement management, the change strategy that involves using rewards to maintain a behavior, was perhaps most clearly demonstrated when the ST participants described how reinforcing the physical, emotional, and mental health benefits they attributed to ST were; in this sample, the outcome was also the reward. Stimulus control, the final change strategy examined in the current study, was described by several women who persevered in locating a fitness class that would fit with their work and other commitments. The ST participant who purchased a kettlebell and began working out with it at home might also illustrate a unique example of stimulus control. Soon after, though, she advocated for a group fitness class at her fitness center. She indicated her desire to continue to use the kettlebell in a way that aligned with her preference for group fitness, and to learn more about this exercise method, were the stimuli that prompted her successful petition for a class; otherwise, she would not have continued to work out with the kettlebell on her own. This might be interpreted as an interesting application of stimulus control; to maintain her
exercise behavior (using the kettlebell), the participant altered her environment significantly (by acting as the catalyst for creation of a kettlebell class).

As noted, the ST participants were the principal focus of the preceding paragraphs; this should not imply that data from the NST participants did not provide a level of support for the theoretical frameworks. Specifically, the NST participants clearly described feelings that define SDT’s construct of relatedness in their aerobic group fitness setting. This was particularly true of the Zumba participants; all mentioned feelings of connectedness, similar to the description provided by one NST woman: “…it is something that you become a part of, that and it becomes part of your routine - you look forward to seeing me, seeing other people, and the camaraderie.” NST participants also talked about a “sense of accomplishment” at the end of their workouts. Additionally, their references to how much “fun” they had while working out suggested that their participation in the group fitness class was self-determined and autonomous; that is, they were clearly participating because they wanted to, and they enjoyed their workouts.

There was less indication that, overall, the NST participants perceived a sense of mastery, or competence, from their aerobic workouts. One NST participant did report a “sense of accomplishment” at the end of her Zumba class, and another spoke of feeling the effort she had put into her “heavy work day” when describing one of the Spin classes she took. There were also fewer instances NST women describing how they applied behavioral TTM Processes of Change strategies to maintain their exercise behavior. Generally, the NST participants did speak positively of their instructors and classmates, which lent support to the concept of employing helping relationships as a strategy to maintain the exercise behavior. An example of counter-conditioning might be the NST participant who decided to enroll in group fitness classes because she realized that she was not exercising to her full physical ability at home. NST participants were more likely to cite examples of the experiential Processes of Change, such as consciousness raising (planning to take a class to learn about ST), dramatic relief (“I’m afraid it will hurt to ST”), and self re-evaluation (“I know I need to ST; I felt better when I strength trained in the past”). Paxton et al., (2008) described the increased use of the cognitive processes of change by individuals who were in earlier stages of change; likewise, those in later stages of change were more apt to use behavioral strategies. Several of the current study’s NST participants did indicate they were in the
contemplation and early action stages with regard to initiating ST; this is reflected in the preceding comments.

In general, the two groups appeared to demonstrate somewhat divergent representations of the theoretical constructs examined, despite having a number of shared characteristics and perceptions. All participants were experienced exercisers who conveyed a self-determined orientation toward exercise, enjoyed their exercise routine, and who felt connected to their exercise groups. Future research efforts might focus on an in-depth exploration to determine if significant differences do exist between ST and NST women in the use of change strategies and competence, and if there truly are differences, what might contribute to one group using them more than the other might.

**IMPLICATIONS FOR RESEARCH**

The ideas and beliefs expressed by the participants in the current study suggest the need for further research on factors associated with women’s long-term participation in strength training activities. This may be especially useful in developing interventions and programs designed to increase women’s participation and adherence to ST; the concept of what may initially “hook” a ST participant needs to be explored. Conversely, reasons why ST is not initially enjoyable for some participants, yet they persist with the activity until it becomes enjoyable, is another worthwhile topic to explore. Framing future research projects within the context of the SDT and the TTM is recommended. Both theories are extensive in explaining physical activity behaviors at all levels of participation. Constructs of the SDT provided ample explanation of the concepts explored in the current study, and aided in developing a clear image of what motivates everyday women to strength train.

**IMPLICATIONS FOR PRACTICE**

Improving knowledge and dispelling mistaken beliefs help promote strength training to women. Women may now have increased awareness that strength training alone will not cause a woman to gain excess musculature (bulking up), and that strategies such as lifting light are ineffective. This is an important discovery, in light of relatively recent reports that many women still believe these and other myths and misconceptions associated with strength training (D’Abundo, 2009; Gill & Kamphoff, 2010; Terre, 2010). In addition to improving knowledge, attitude shifts are also needed. Women may have the cognitive knowledge that
they will not bulk up, but may not have internalized that concept. Fitness and health professionals can not only educate women on the physiological aspects associated with ST as well as the need for this activity but can also serve as role models for ST participation. Both male and female fitness and healthcare professionals can demonstrate attitudes that convey acceptance of the physical attributes associated with ST (such as increased muscle mass, potential slight weight gain). Fitness instructors can also stress the importance of a well-rounded physical activity program that includes aerobic and strength conditioning.

In addition to education on strength training, creating a welcoming, supportive environment in the group fitness setting is another step toward encouraging greater participation in strength training by women. Fitness instructors who are not only technically competent, but are also skilled communicators and facilitators are essential for a successful group fitness atmosphere. Finally, marketing ST as functional fitness, by stressing the improved ability to conduct activities of daily living, may be an effective approach. The notion that ST can help make activities such as lifting young children, carrying groceries, and yard work easier to accomplish, and that they will have more energy overall, may appeal to women. Group fitness ST classes often incorporate whole body exercises that can enhance functional fitness.

**IMPLICATIONS FOR POLICY**

Shifting cultural and social norms and women’s images of femininity are necessary before widespread behavior change is possible, though. Until society and individual women are able to reconcile a woman’s simultaneous capacity for strength while maintaining her femininity, it is unlikely that strength training will be a mainstream physical activity for women of all ages.

The lack of free or low-cost ST resources may prevent a number of women from learning ST exercises and techniques. ST can be accomplished with little or no equipment; organizational investment would primarily be related to disseminating information, education, and engaging qualified instructors, if resources for equipment were limited. Investments such as these, to implement programs aimed at increasing exposure to ST, are cost-effective preventive health measures. Organizations and communities sometimes offer
on-going free or no cost aerobic conditioning classes; the addition of a strength training class would also increase exposure and acceptance among women.

**CONCLUSION**

The primary purpose of the current study was to explore concepts associated with women and strength training with a sample of women who have made physical activity an integral part of their lives. The social support and motivation derived from a group fitness setting was an integral element of strength training participation and overall physical activity adherence for the women in the sample. In strength training activities, trust in others and in one’s self is essential for gaining competence, confidence, and continued growth.

The decision to participate in strength training activities may be more complex for women than simply another choice in exercise method. Continued participation in strength training may also be associated with emotional and cognitive factors that extend far beyond the physical benefits of the activity as well.
REFERENCES


APPENDIX A

SCREENING TOOL – GROUP FITNESS PARTICIPANTS
The following questions determine if you qualify for a study about women and strength training. All personal information will remain confidential. After all participant information is collected, a report will be prepared without any reference to individuals. The information sheets will be destroyed after that time.

Directions: Please circle your response to the questions below. Numbers listed before responses are for statistical coding, and have no other meaning.

<table>
<thead>
<tr>
<th>Question</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are you a woman, between the ages of 30 and 59 years?</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>2. Do you live in Southern California?</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>3. Do you participate in group fitness classes?</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>4. If you answered YES to Question #3, have you participated in group fitness classes for <strong>at least</strong> six months?</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>5a. If you answered YES to Question #4, do you participate in <strong>group aerobics classes three times a week</strong> or more, on average?</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>5b. If you answered YES to Question #4, do you participate in <strong>group strength training classes two times a week</strong> or more, on average?</td>
<td>Yes (1)</td>
</tr>
</tbody>
</table>

If you answered **YES** to questions 1 – 4 and **YES** to either 5a or 5b, you qualify for participation in the study. Participation involves completing surveys about your exercise habits and beliefs. Some participants will be asked to meet with the researcher for a personal interview.

If you are interested in participating or would like more details, please provide your contact information below, and leave with the manager on duty. Your information will remain confidential. You will be contacted within 3 business days by the researcher, or you may contact her directly: Susan Mojica (susanmojica@gmail.com; 607-591-0753)
<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
</table>

How do you prefer to be contacted?  E-mail_____ phone call_____ text message_____
If contact is by phone, when is the best day of the week and time:___________________________
APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE – GROUP FITNESS PARTICIPANTS
The following questions are about you. All personal information will remain confidential. After all participant information is collected, a report will be prepared without any reference to individuals. The information sheets will be destroyed after that time.

**Directions:** Please circle or enter the information requested below. The numbers and letters listed before responses are for statistical coding, and have no other meaning.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your age?</td>
<td>__ __ years</td>
</tr>
<tr>
<td>2. Do you think of <strong>you</strong>self as being Latino, Hispanic, Mexican/Mexican American, or of Spanish origin?</td>
<td>1 – Yes</td>
</tr>
<tr>
<td></td>
<td>0 – No</td>
</tr>
<tr>
<td>3. Which one or more of the following would you say is your race? (Circle all that apply)</td>
<td>a – White</td>
</tr>
<tr>
<td></td>
<td>b – Black or African American</td>
</tr>
<tr>
<td></td>
<td>c – Asian</td>
</tr>
<tr>
<td></td>
<td>d – Native Hawaiian or Other Pacific Islander</td>
</tr>
<tr>
<td></td>
<td>e – American Indian or Alaska Native</td>
</tr>
<tr>
<td></td>
<td>f – Other (specify) ___________</td>
</tr>
<tr>
<td>4. Are you…</td>
<td>1 – married, living with spouse</td>
</tr>
<tr>
<td></td>
<td>2 – married, not living with spouse</td>
</tr>
<tr>
<td></td>
<td>3 – living as married</td>
</tr>
<tr>
<td></td>
<td>4 – divorced</td>
</tr>
<tr>
<td></td>
<td>5 – widowed</td>
</tr>
<tr>
<td></td>
<td>6 – separated</td>
</tr>
<tr>
<td></td>
<td>7 – single</td>
</tr>
<tr>
<td>5. How many adults (anyone 18 years of age or older) live in your household, including yourself?</td>
<td>__ __ adults</td>
</tr>
<tr>
<td>6. How many children under 18 years of age live in your household?</td>
<td>__ __ children</td>
</tr>
</tbody>
</table>
6a. In addition to children, do you care for anyone else in your home (such as a parent or physically or mentally challenged family member)? If yes, please indicate how many individuals. | __ __ individuals |
---|---|
7. What is the highest grade or year of school you have completed? | 1 – up to grade 12  
2 – High school diploma or GED  
3 – Technical school (after high school)  
4 – Some college  
5 – Associate’s degree  
6 – Bachelor’s degree  
7 – Graduate/professional (MD, JD) degree |
8. Are you currently… | 1 - employed for wages full-time  
2 – employed for wages part-time  
3 – self-employed  
4 – out of work for more than 1 year  
5 – a homemaker  
6 – a student  
7 – retired  
8 – unable to work |
9. If you work outside of the home, what is your occupation?  
Of the following, which best describes your occupation... | 0 - Professional or Technical  
1 - Manager, Official or Proprietor  
2 - Clerical  
3 - Sales Worker  
4 - Skilled Manual Worker  
5 - Service Worker  
7 – Laborer  
88 – Do not work outside home |
10. How many hours per week do you usually work? | __ __ hours work per week  
88 – Do not work |
11. How do you get to fitness classes? | 1 – Walk |
12. How much do you pay for fitness classes?
Please select one method from the list:

- **Per class** – you pay for each class separately
- **Monthly** – you pay for a series of classes or unlimited classes during a specific period, such as a month.
- **Do not pay** – classes are free of charges, including fitness center membership fees, and the class is free for anyone

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Per class: Less than $5 per class</td>
</tr>
<tr>
<td>2</td>
<td>Per class: $5 to $10 per class</td>
</tr>
<tr>
<td>3</td>
<td>Per class: Over $10 per class</td>
</tr>
<tr>
<td>4</td>
<td>Monthly: less than $25/month</td>
</tr>
<tr>
<td>5</td>
<td>Monthly: between $25 and $50/month</td>
</tr>
<tr>
<td>6</td>
<td>Monthly: more than $50/month</td>
</tr>
<tr>
<td>88</td>
<td>I do not pay for fitness classes</td>
</tr>
</tbody>
</table>
APPENDIX C

SCREENING TOOL – GROUP FITNESS INSTRUCTORS
The following questions determine if you qualify for a study about women and strength training. All personal information will remain confidential. After all participant information is collected, a report will be prepared without any reference to individuals. The information sheets will be destroyed after that time.

Directions: Please circle your response to the questions below. Numbers listed before responses are for statistical coding, and have no other meaning.

1. Are you a group fitness instructor?
   - 1: Yes
   - 0: No

2. Do you work in Southern California?
   - 1: Yes
   - 0: No

3. Have you been a group fitness instructor for at least three years?
   - 1: Yes
   - 0: No

4. If you answered YES to Question #3, have you taught group fitness strength training classes for at least one year?
   - 1: Yes
   - 0: No

5. If you answered YES to Question #4 do your strength training classes include women ages 30 – 59 years?
   - 1: Yes
   - 0: No

6. Are you certified through a national organization, such as ACE, NSCA, NASM, or other fitness or strength and conditioning association?
   - 1: Yes
   - 0: No

If you answered YES to the above questions, you qualify for participation in the study. Participation involves meeting with the researcher for a personal interview. If you are interested in participating or would like more details, please provide your contact information below, and leave with the manager on duty. Your information will remain confidential. You will be contacted within 3 business days by the researcher, or you may contact her directly: Susan Mojica (susanmojica@gmail.com; 607-591-0753)
<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
</table>

How do you prefer to be contacted?  
E-mail  phone call text message
APPENDIX D

DEMOGRAPHICS QUESTIONNAIRE – GROUP FITNESS INSTRUCTORS
The following questions are about you. All personal information will remain confidential. After all participant information is collected, a report will be prepared without any reference to individuals. The information sheets will be destroyed after that time. Please circle or enter the information requested below.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. What is your age?</td>
<td>__ __ years</td>
</tr>
</tbody>
</table>
| 2. Do you think of yourself as being Latino, Hispanic, Mexican/Mexican American, or of Spanish origin? | 1 – Yes  
0 – No |
| 3. Which one or more of the following would you say is your race? (Check all that apply) | a – White  
b – Black or African American  
c – Asian  
d – Native Hawaiian or Other Pacific Islander  
e – American Indian or Alaska Native  
f – Other (specify)  
__________________________________ |
| 4. What is your gender? | 1 – Female  
2 – Male |
| 5. How long have you been leading group fitness classes? | 1 – Less than three years  
2 – Three to five years  
3 – Five to seven years  
4 – Seven to ten years  
5 – Ten to fifteen years  
6 – More than 15 years |
| 6. Are you certified by any of the following associations or organizations? Please circle all that apply, or write in your certification(s). | 1 – American Council on Exercise (ACE)  
2 – National Strength and Conditioning Association (NSCA)  
3 – Aerobics and Fitness Association of America (AFAA) |
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. How many hours per week do you usually teach group fitness strength-</td>
<td>4 – National Exercise Trainers Association (NETA)</td>
</tr>
<tr>
<td>training classes?</td>
<td>5 – Other____________________________________________________________________</td>
</tr>
<tr>
<td></td>
<td>__ ___ hours per week</td>
</tr>
<tr>
<td>8. How many group fitness strength-training classes do you usually teach</td>
<td>1 – Less than two</td>
</tr>
<tr>
<td>per week?</td>
<td>2 – Two</td>
</tr>
<tr>
<td></td>
<td>3 – Three to five</td>
</tr>
<tr>
<td></td>
<td>4 – Five to ten</td>
</tr>
<tr>
<td></td>
<td>5 – More than ten</td>
</tr>
</tbody>
</table>
APPENDIX E

INTERVIEW GUIDE – GROUP FITNESS PARTICIPANTS
Women and Strength Training Study
Interview Guide for Group Fitness Participants

Introduction

Introduce self - name and affiliation. Explain that I am a graduate student at San Diego State University, enrolled in the Public Health program, and I am conducting a study on women and strength training as a part of my degree program requirements.

Purpose of Interview

Strength training (ST) provides a number of substantial health and quality of life benefits, yet most Americans do not participate in regular, on-going strength building activities. Less than 20% of American women report meeting national recommendations for strength training, which involves doing physical activities specifically designed to strengthen muscles at least twice a week. Whether you participate in strength training or not, I am interested in knowing your views about this issue and what your experiences with strength training may have been. I appreciate your spending some time with me today to discuss this issue. There are no right or wrong answers. Please feel free to stop me at anytime if you do not understand a question or need to take a break.

If it is okay with you, I will be recording our conversation. The purpose of this is so that I can get all the details but at the same time be able to carry on an attentive conversation with you. I assure you that all your comments will remain confidential. I will be compiling a report that
will contain all interview comments without any reference to individuals. After the audiotaped information is written on paper, the recording will be erased. If you agree to this interview and the tape recording, please sign this consent form.

There are different titles and types of fitness specialists. Fitness specialists may teach or train individuals as well as groups, and some teach several kinds of fitness classes, such as aerobics as well as strength and conditioning classes. In this interview, I will be using the term “group fitness” to refer to a group of three or more individuals participating in an exercise class. The class I would like you to think about when answering question about group fitness classes is the strength training (or aerobics class) you participate in most often.

Interview Begins

Good morning/afternoon, ____________. How are you? Thank you for joining me today. We are going to be talking about women and strength training. First, I would like to ask you a few questions about your experience as a group fitness participant.

1. How long have you been exercising in a group fitness class setting?

2. How did you get started taking group fitness classes?
   a. Probe: Did you first start going because a friend invited you, or you liked the idea of group fitness, or some other reason?

3. What fitness classes do you typically take?

4. Where do you take classes?

5. What classes do you take?
   a. If participates in one class: What do you like best about the class you take?
i. Probe: Describe how the instructor interacts with the class, the exercises you do, the size of the class, and the music.

b. *If participates in more than one class*: Which class is your favorite, and what are the reasons you like it best?

   i. Probe: Describe how the instructor interacts with the class, the exercises you do, the size of the class, and the music.

c. *If strength training class participant*:

   i. How long have you been taking strength-training classes?
   
   ii. What first interested you in strength training classes?

      1. Probe: Did a friend or someone else invite you to a class; had you heard something about strength training that made you want to do it?

6. I now want to ask you some specific questions about strength training. When you hear the term “strength training,” what comes to mind?

   a. Probe: What activities come to mind; what activities or exercises would you classify as strength training?

   b. Probe: Describe the type of person that does strength training?

7. Describe some of the benefits of strength training.

   a. Probe: Can you think of potential physical, health, and/or other benefits?

8. What are some of the risks of strength training?

   a. Probe: What might be reasons to avoid strength training?

      i. Probe: How does age, gender, occupation, or other individual characteristics affect whether someone should strength train or not?

      ii. Probe: How does health or disease affect strength-training activities?
9. There are some common beliefs about women and strength training. One is that strength training will cause women to “bulk up,” meaning strength training makes a woman larger and/or heavier. Women may avoid strength training because they do not want to “look like a man.” Discuss how likely an average woman is to develop large muscles or other masculine features if she strength trains a couple times a week.

   a. Probe: How concerned should a woman who strength trains twice a week in a group fitness class be about getting too muscular?

10. A number of women who do strength train say they “go light,” or use lighter weights than they are capable of lifting, as a way to avoid getting too muscular; other women decrease the time spent strength training to avoid becoming too muscular. What are your thoughts on these strategies? If you have heard this advice before, who told you, and do you follow it?

11. What do your group fitness instructors say about strength training in a group fitness class?

   a. Probe: What do they say about benefits, techniques, and/or guidelines related to strength training?

12. How would you react if a friend or family member told you that they noticed a change in your appearance, such as your biceps (arm muscles) or quadriceps (thigh muscles) becoming larger?

13. Can you please tell me what are the reasons that you do (or do not) strength train?

   a. Probe: Think about all the reasons someone might workout, such as health, appearance, performance, weight management, doctor’s recommendation, and many others.

**Wrap-Up**

Please describe anything else related to the topic of women and strength training that I should have covered but did not.
Do you have any questions for me?

Thank you for your time and participation. You have provided valuable information and I appreciate this opportunity to meet with you.

Please feel free to contact me at the number or email address I have listed on the flyer if you have any questions later.
APPENDIX F

INTERVIEW GUIDE – GROUP FITNESS INSTRUCTORS
Women and Strength Training Study

Interview Guide for Group Fitness Instructors

Introduction

Introduce self - name and affiliation. Explain that I am a graduate student at San Diego State University, enrolled in the Public Health program, and I am conducting a study on women and strength training as a part of my degree program requirements.

Purpose of Interview

Strength training (ST) provides a number of substantial health and quality of life benefits, yet the majority of Americans do not participate in regular, on-going strength building activities. Less than 20% of American women report meeting national recommendations for strength training, which involves doing physical activities specifically designed to strengthen muscles at least twice a week. I am interested in knowing your views about this issue and what your experiences with instructing group strength training classes with female participants have been. I appreciate your spending some time with me today to discuss this issue. There are no right or wrong answers. Please feel free to stop me at anytime if you do not understand a question or need to take a break.

If it is okay with you, I will be recording our conversation. The purpose of this is so that I can get all the details but at the same time be able to carry on an attentive conversation with you. I assure you that all your comments will remain confidential. I will be compiling a report that will contain all interview comments without any reference to individuals. After the
audiotaped information is written on paper, the recording will be erased. If you agree to this interview and the tape recording, please sign this consent form.

I realize there are different titles and types of fitness specialists. Fitness specialists may teach or train individuals as well as groups, and some teach several kinds of fitness classes, such as aerobics as well as strength and conditioning classes. In this interview, I will be using the term “group fitness instructor” to refer to your role when you instruct a group of three or more individuals, and the classes I would like you to think about are the strength training classes you teach that have female participants.

**Interview Begins**

Good morning/afternoon, ____________. How are you? Thank you for joining me today. We are going to be talking about women and strength training. First, I would like to ask you a few questions about your background as a fitness instructor.

1. How long have you been a group fitness instructor?
2. What group fitness classes do you teach?
3. How did you become involved in teaching group strength training classes?
   a. Probe: What first interested you in teaching strength training?
4. Describe the format of one of your typical group fitness strength training classes.
   a. Probe: Describe the routine activities, such as warm-up, exercises, and cool-down.
5. **Probe:** Describe your interactions with the class; for example, how do you find out if there are new students? How do you get feedback from all students on their understanding of your instructions and if the workout is appropriately challenging?

6. **Describe the composition of a typical group fitness class.**
   a. **Probe:** Describe the size of an average class and the ratio of students who have less than six months experience versus students who have been strength training at least twice a week for more than six months.
   b. What are the male and female participation rates?
   c. **Probe:** Describe general characteristics of your students – age, ethnicity, occupation, and discuss whether your students are generally similar in background, or if there is a wide range in backgrounds.

7. **What changes have you observed in participation rates in strength training activities from when you first started teaching strength-training classes until now?**
   a. **Probe:** Think about changes in participation rates – are there more or less participants? Think about changes or trends in participant demographics with regard to men and women, older and younger adults, and ethnicity.

8. **What changes have you noticed in people’s attitudes toward strength training in the time that you have been teaching?**

9. **What do you tell your class participants about health benefits related to physical activity and strength training?**

10. **How do you address common beliefs related to women and strength training in your class?** For example, how do you respond to participant beliefs that women will get
bulkier and “look like a man” if they strength train, and that women should “lift light,” meaning use lighter weights than they are capable of lifting?

11. Describe your experiences with teaching strength training to women in a group format.
   a. Probe: What questions do they ask you about technique, workout frequency, weight progression and other strength training related topics?
   b. Probe: What behaviors do you observe (for example, weight selection; class position selection – front or back of class; non-verbal responses to your instructions)?

12. What is the average woman’s knowledge level regarding strength training?
   a. Probe: What do they know about the benefits of strength training?
   b. Probe: What do they know about national recommendations for strength training?

13. How do family and friends influence women’s participation in strength training classes?

14. From your experience, describe characteristics or traits that women who strength train have in common.
   a. Probe: Describe the typical woman who has been a regular, twice-a-week participant in strength training classes for longer than six months.
15. Describe the differences in a group strength training setting versus an individual strength training session.

a. Probe: What are differences in intensity, duration or other activity related factors in someone who works out with a group versus an individual, training alone?

b. Probe: In what way does the group format influence on psychological factors like attitude, motivation, or determination regarding strength training?

**Wrap-Up**

Please describe anything else related to the topic of women and strength training that I should have covered but did not.

Do you have any questions for me?

Thank you for your time and participation.

You have provided valuable information and I appreciate this opportunity to meet with you.

Please feel free to contact me at the number or email address I have provided to you if you have any questions later.
APPENDIX G

SURVEY QUESTIONNAIRE – BREQ-2
EXERCISE REGULATIONS QUESTIONNAIRE (BREQ-2)

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Not true for me</th>
<th>Sometimes true for me</th>
<th>Very true for me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I exercise because other people say I should</td>
<td>0</td>
<td>1</td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>2 I feel guilty when I don’t exercise</td>
<td>0</td>
<td>1</td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>3 I value the benefits of exercise</td>
<td>0</td>
<td>1</td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>4 I exercise because it’s fun</td>
<td>0</td>
<td>1</td>
<td>2, 3, 4</td>
</tr>
</tbody>
</table>
5 I don’t see why I should have to exercise 0 1 2 3 4

6 I take part in exercise because my friends/family/partner say I should 0 1 2 3 4

7 I feel ashamed when I miss an exercise session 0 1 2 3 4

8 It’s important to me to exercise regularly 0 1 2 3 4

9 I can’t see why I should bother exercising 0 1 2 3 4
<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Not true for me</th>
<th>Sometimes true for me</th>
<th>Very true for me</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>I enjoy my exercise sessions</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I exercise because others will not be pleased with me if I don’t</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I don’t see the point in exercising</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I feel like a failure when I haven’t exercised in a while</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>I think it is important to make the effort to exercise regularly</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>I find exercise a pleasurable activity</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>I feel under pressure from my friends/family to exercise</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>I get restless if I don’t exercise regularly</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>I get pleasure and satisfaction from participating in exercise</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
19 I think exercising is a waste of time

Thank you for taking part in our research

SOURCE: DAVID MARKLAND PHD, C.PSYCHOL

School of Sport, Health & Exercise Sciences
University of Wales, Bangor
d.a.markland@bangor.ac.uk
Tel: 01248 382756
April 2000
APPENDIX H

SURVEY QUESTIONNAIRE – MDS
The following statements concern the reasons people often give when asked why they exercise.

If you do not consider a statement to be true for you at all, circle the ‘0’. If you think that a statement is very true for you, circle the ‘5’. If you think that a statement is partly true for you, then circle the ‘1’, ‘2’, ‘3’ or ‘4’, according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why you personally choose to exercise or might choose to exercise, not whether you think the statements are good reasons for anybody to exercise.

<table>
<thead>
<tr>
<th>Personally, I exercise (or might exercise) ...</th>
<th>Not at all true for me</th>
<th>Very true for me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To achieve greater muscle mass</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. To become strong and powerful</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. To tone and define my muscles</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. To increase my body size</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. To stay slim</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6. To lose weight</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>7. To help control my weight</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8. Because exercise helps me burn calories</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9. Because I like people to know that I am</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>fit and healthy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. To improve my appearance</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>11. Because I like to be seen as a fit and</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>healthy person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. To look more attractive</td>
<td>0 1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
13. Because exercise helps me to burn calories
APPENDIX I

SURVEY QUESTIONNAIRE – CHANGE STRATEGIES
Change Strategies

The following are activities, thoughts, and feelings people use to help them change their physical activity level. Think of any similar experiences you may be having or have had in the past month. Then rate HOW OFTEN you do each of the following using the scale below:

<table>
<thead>
<tr>
<th>Activity</th>
<th>NEVER</th>
<th>ALMOST NEVER</th>
<th>SOME TIMES</th>
<th>OFTEN</th>
<th>MANY TIMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>I look for information about physical activity or sports.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I keep track of how much physical activity I do.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find ways to get around the things that get in the way of being physically active.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think about how my surroundings affect the amount of physical activity I do (surroundings are things like having exercise equipment at home or a park nearby).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I put reminders around my home to be physically active.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I reward myself for being physically active.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do things to make physical activity more enjoyable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think about the benefits I will get from being physically active.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I try to think more about the benefits of physical activity and less about the hassles of being active.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I say positive things to myself about physical activity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I get off track with my physical activity plans, I tell myself I can start again and get right back on track.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a friend or family member who encourages me to do physical activity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I try different kinds of physical activity so that I have more choices.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I set goals to do physical activity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I make back-up plans to be sure I get my physical activity.</td>
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</tbody>
</table>
APPENDIX J

SURVEY QUESTIONNAIRE – FITNESS QUIZ
1. The most effective exercise plan is:
   □ Strength (resistance) training two times a week
   □ Aerobic (cardio) workouts three or more times a week
   □ A combination of strength training and aerobic activity

2. Certain exercises can help reduce fat in target areas, like your waist, thighs, or hips.
   □ True
   □ False

3. How long will it take to see changes in your fitness level if you are doing moderate intensity (somewhat hard) aerobic activities for 30 minutes, three times a week?
   □ One to three weeks
   □ One to two months
   □ You won’t see changes with moderate intensity activities; only high intensity produces change

4. What is the best type of workout for maximum fat burning?
   □ Low intensity workouts
   □ High intensity workouts
   □ Moderate intensity workouts

5. Strength (resistance) training has limited benefit for older people since we lose muscle mass every year after about 30 years of age.
   □ True
   □ False

6. What key parts of a physical activity program should you focus on to improve your fitness level?
   □ Frequency, intensity, time
   □ Calorie intake, altitude, humidity
   □ Metabolism rate, time, type of activity

7. Women should use lighter weights to avoid high-intensity or high-load training.
   □ True
   □ False

8. As part of a strength program, you've been doing bicep curls with hand weights for about three months. You do 12 repetitions (reps) with a seven-pound weight three times a week. At
first, you struggled with the last couple of reps, but now you’re getting through them easily and are starting to get bored. You need to:

- Do more reps – increase to three sets of 15 reps
- Increase the weight
- Do nothing – you may be at a plateau on your fitness level
- Add another day to your workout routine - do the bicep curls on four days

9. Which of the following is NOT one of the three basic types of exercise that should be included in an exercise program?

- Cardiovascular
- Toning
- Flexibility
- Strength

10. Women should follow different strength training guidelines and exercise routines guidelines than men.

- True
- False

11. You want to increase your level of cardio-respiratory endurance. You choose to do:

- Push-ups
- Jumping rope
- Triceps dips
- Shoulder stretches with a towel

12. Strength training will cause women to become larger and bulk up.

- True
- False

13. Strengthening your core (abdominal muscles) can help:

- Protect against back pain
- Improve your golf game
- Make it easier to tie your shoes, vacuum the carpet, and surf the ‘Net for hours
- All of the above

14. When you strength train, you:

- Work the muscles against progressive resistance or overload
- Continually move the muscles for long periods of time
- Are increasing the range of motion in the joints
- Need to wear a strength training girdle

15. **Building muscle mass will make it more difficult to lose weight, by slowing one’s metabolism.**

- True
- False