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EXPLORING THE SOCIOCULTURAL PATHWAY MODEL AS IT PREDICTS BODY SATISFACION IN ATHLETES AND NONATHLETES

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EXPLORING THE SOCIOCULTURAL PATHWAY MODEL AS IT PREDICTS

BODY SATISFACION IN ATHLETES AND NONATHLETES

BY

SARAH HOWES-MASNIK

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OF

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ABSTRACT

This study was a secondary data analysis in which the sociocultural pathway model (Stice & Agras, 1998) was tested in male and female athletes and nonathletes. There were three primary purposes for this study. The first aim was to test the applicability of the sociocultural model theory in the current sample by conducting confirmatory factor analyses on the measurement constructs. The second aim was to create a structural equation model that fit the data best according to theoretical directionality of the constructs in the sociocultural theory. The third aim was to compare the predictive paths of this model across sexes and athlete subgroups. The sample ($\underline{N}$=543) was composed of competitive athletes (n=56), recreational athletes (n=192), and non-athletes (n=294) who completed an online questionnaire measuring the major components of the sociocultural pathway model. Construct means were examined in nonathletes and athletes of both sexes using two-way multivariate analysis of variance, follow-up two-way analyses of variance, and post-hoc Tukey HSD tests. Confirmatory factor analyses were run on the original factor structures of each construct and found model fit to be poor. Measures were revised, cutting poorly loading items and confirmatory factor analyses were conducted on revised measures, finding model fit to be adequate. A structural equation model predicting body satisfaction from the internalization of thin ideals, negative affect, positive affect, and perfectionism had low-adequate fit in the sample. Comparisons of the predictive model revealed that the model fit to be adequate across group. Findings suggest the field is in need of improved operational definitions and more psychometrically sound measures of body satisfaction. Attention to measurement of other constructs of the

sociocultural pathway model is also warranted. Future research should examine measurement structures and invariance across a range of minority groups, as well as longitudinal models to test and expand the applicability of this model of eating disorders prevention.

ACKNOWLEDGMENTS

DEDICATION

To

my parents, who gave me vision and support.

my wife, who gave me unconditional love.

And

my daughter, who gave me hope and positivity.

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CHAPTER 1

INTRODUCTION

Eating disordered behaviors are pathological ways to control weight such as self-induced vomiting, dieting, bingeing, skipping meals, or laxative use (Combs, Pearson, Zapolski, & Smith, 2012). Eating disordered attitudes are also pathological and include body dissatisfaction, shape and weight concerns, and preoccupation with food (Gowey, Lim, Clifford, & Janicke, 2014). These attitudes have been shown to lead to disordered eating behaviors (Neumark-Sztainer et al., 2006). Together, disordered eating behaviors and disordered eating attitudes are core features of subclinical and clinical eating disorders (Culbert et al., 2013).

Body image, according to Cash (2003), includes an individual's thoughts, beliefs, feelings, and behaviors surrounding the perception of his/her body. Body dissatisfaction, or having negative thoughts, beliefs, feelings, and behaviors surrounding the body, is a risk factor for subclinical and clinical eating disorders (Reel & Gill, 1996; Stice, 2001). Research suggests body dissatisfaction has a direct relationship with disordered eating, that is to say the more dissatisfied an individual is with their body, the more disordered eating symptoms are reported (Stice, 2002). This finding has been replicated in female athletes (Anderson, Petrie, & Neumann, 2012). There is also support for the idea that athletes have more than one body image (De Bruin, Oudejans, Bakker, & Woertman, 2011) and body image dissatisfaction in female athletes can occur when their sport image contradicts the societal ideal of beauty (Greenleaf, 2002).

CHAPTER 2

REVIEW OF LITERATURE

Who Suffers from Subclinical and Clinical Eating Disorders?

Approximately 10% of adolescent women meet criteria for an eating disorder

(e.g. anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified) as

defined by the DSM-IV (Allen, Oddy, Byrne, & Crosby, 2013; Stice, Marti, & Rohde,

2013). Many studies have found that disordered eating has a higher prevalence rate in

female athletes participating in endurance, lean, weight-dependent, and/or aesthetic

sports than in the nonathletic population (Anderson, Petrie, & Neumann, 2012;

Bachner–Melman, Zohar, Ebstein, Elizur, & Constantini, 2006; Greenleaf, Petrie,

Carter, & Reel, 2009; Smolak, Murnen & Ruble, 2000; Hausenblas & Carron, 1999;

Holm-Denoma et al., 2009; Sundgot–Borgen & Torstveit, 2004; Torstveit, Rosenvinge,

& Sundgot–Borgen, 2008).

Eating disorders yield the highest mortality rate of all the psychiatric disorders

(Keca, & Cook-Cottone, 2005). In clinically diagnosed samples, the suicide rate has

also been found to be elevated (Fairburn et al., 2000). Unfortunately those with eating

disorders rarely seek treatment (Johnson et al., 2002); thus the field's understanding of

risk factors and causes of eating disorders is limited. These startling statistics

underscore the need for improved preventive efforts.

Since researchers began mapping the etiology of eating disorders, it has been

common practice to accept that, by nature of sport as physical, athletes are at risk to

develop body image dissatisfaction and subclinical eating disorder symptoms (Byrne & McLean, 2001; Greenleaf, Petrie, Carter, & Reel, 2009; McClellan, 2009, Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen & Torstveit, 2004). Historically, the field of has found ample evidence to support that female athletes, performing in lean, aesthetic sports, are at risk for developing subclinical eating disorder symptoms, defined as those that do not meet current DSM 5 criteria for a clinical eating disorder, yet are worrisome eating problems and body image or weight concerns (Beals & Manore, 1994; Sanford-Martens et al., 2005). Since Rosen et al. (1986) found that a substantial percentage of female athletes reported pathogenic weight controlling behavior, some researchers have found support for more eating pathologies in female athletes versus non-athletes (Greenleaf, Petrie, Carter, & Reel, 2009; Sundgot-Borgen & Torstveit, 2004; Petrie, Greenleaf, Carter, & Reel, 2009).

However, there are methodological and theoretical shortcomings to the research literature as a whole. These methodological shortcomings are primarily explained by the limitation of instruments used by the field. Originally constructed to measure symptoms in athletes, the Eating Disorder Inventory (Garner, Olmstead, & Polivy), and the Eating Attitudes Test (Garner & Garfinkel, 1979) have been used inappropriately to find prevalence rates in athletes, a practice which has been at least partly to blame for inconsistent findings in the field (Hausenblas & McNally, 2004). Prevalence rates based solely on these scales are inappropriate.

Media's Impact on the Development of Eating Disorders in America

The role of the media in the development of eating disorders is unequivocal. As it is the most consumed avenue delivering messages containing social standards, media

is a powerful force in upholding the status quo. Media has a particularly strong role in the most empirically supported model of eating disorder development, the sociocultural model (Groesz, Levine, & Murnen, 2002; Thompson & Stice, 2001). One of the most significant variables leading to eating disorder development, according to the sociocultural model, is the internalization of thin ideals (Thompson & Stice, 2001). These ideals are symbolized in consumed forms via television series, commercials, print ads, movies, music, and recently, social media (Mabe, Forney, & Keel, 2014). Several researchers have found links between media exposure and body dissatisfaction and eating disorder symptomatology (Harrison & Cantor, 1997; Stice et al., 1994). In a study by Nichter and Nichter (1991), adolescent girls described the ideal girl as 5 ft. 7 in., 100 lb., size 5, with long blond hair and blues eyes. This depiction supports that, from an early age, both American boys and girls are inundated with media images and messages of what it means to be beautiful. For girls, this ideal image is of a thin, lean woman; while for boys, this ideal image is of a strong, muscular man. Psychologists argue that it is not the images themselves that might lead to eating disorders, but the extent to which individuals internalize their underlying messages, such as "I must be thin and beautiful to succeed", that might lead to an eating disorder. Still, this model fails to explain why, if most members of the population receive these messages through the media, only a small number actually go on to develop an eating disorder. It is also important to note that other institutions such as family, peers, schools, athletics, and businesses support this idealized image of beauty (Thompson & Stice, 2001) to varying degrees.

Feminists describe these media messages and images as explicit forms of sexual objectification of the female body (Tiggemann, 2013). This theory is known as objectification theory and posits that the female body is socially constructed as an object meant to be evaluated by its appearance. It is suggested by Fredrickson and Roberts (1997) that a woman's repeated experiences of objectification will eventually lead her to arrive at the conclusion of the observer's, usually a man's, appraisal of her body. That is to say a woman begins to evaluate herself, or survey her body as an object based on appearance, a process termed "self-objectification" (Fredrickson & Roberts, 1997). Self-objectification can lead to many behavioral and cognitive responses, including shame, anxiety and guilt when a woman's body does not meet those social standards shown in the media. Among the behavioral consequences of self-objectification are eating disorders (Tiggeman, 2013). Feminist theory recognizes that, although all Western women do live in a culture that sexually objectifies women, not all women will internalize the observer's evaluation of their bodies. Self-objectification is also seen as a trait that is stable over time, which some women, perhaps who go on to develop an eating disorder, possess (Slater & Tiggemann, 2012). Regarding the link between self-objectification and eating disorders, Calogero (2009) and Tylka & Sabik (2010) found support for the mediating relationship between body shame, self-objectification, and disordered eating in community samples. Moradi, Dirks, and Matterson (2005) provide additional support for the inclusion of self-objectification in models of eating disorder development as they found that in their sample of N=221 undergraduate women, sexual objectification experiences, the internalization of those

experiences, body surveillance, and body shame were all significant predictors of eating disorder symptomatology.

Self-objectification theory provides other possible explanations for why not all women develop eating disorders despite being consumers of the same social standards and ideals. A study by Harper and Tiggemann (2008) sought to test the variable of state self-objectification, meaning the varied responses one gives contingent on the environment. By giving participants a set of thin idealized images of females, Harper and Tiggemann (2008) ascertained that state self-objectification, weight-related appearance anxiety, body dissatisfaction, and negative mood were elicited in some female participants. However, not all participants reported state self-objectification, giving credence to the theory's postulate that not all women will self-objectify; thus, not all women will go on to show behaviors, such as eating disorders, that result from self-objectification.

Pioneering neuropsychology research also suggests self-objectification theory presents a plausible biological explanation for why not all women internalize ideals of beauty and go on to develop eating disorders (Riva et al., 2014). In this analysis, self-objectification is considered a cognitive process in which a woman uses an allocentric frame of reference to remember times in which she evaluates herself based on her appearance (Riva et al., 2014). The allocentric ("from outside") lock hypothesis suggests that women with eating disorders view themselves from the outside. Interestingly, this hypothesis views the source of the distorted body image in the cognitive processes of the individual, positing that the woman is locked into a negative memory of her body (from repetitive negative objectifications) and is no longer

sensitive to bodily changes (Riva et al., 2014). These theories identify cognitive

processes as the reason why only some and not all Western women develop an eating

disorder, despite all receiving messages of the thin ideal.

This discussion of self-objectification theory leads to further description of other

theoretical models that have been developed to explain the development of eating

disorders.

Theoretical Models

The sociocultural model is the most widely accepted and scientifically

scrutinized theoretical model explaining eating disorder development. Although the

field has historically accepted this model, there are several other theoretical models that

also seek to explain eating disorder etiology. These models include cognitive

behavioral theory, feminist theory, and neuropsychological explanations for eating

disorder development. Noting that feminist theory and neuropsychological models have

been discussed, further explanation of cognitive behavioral theory is included in this

section. Additionally, support for the sociocultural model of eating disorder

development is reviewed.

Behaviorists originally thought eating disorders developed out of fears of fatness

and body image disturbances (Russell, 1979). Over time Behavioral theory integrated

concepts from cognitive psychology, giving the field a cognitive-behavioral model of

eating disorder development. This model includes: a) the body self-schema, b)

cognitive biases, c) binge eating, d) compensatory behavior, e) negative reinforcement

of compensatory behavior by reduction of negative emotion, and f) psychological risk

factors (Williamson, White, York-Crowe, & Stewart, 2004). Several studies support this cognitive behavioral model including Williamson et al. (1999) in which the researchers proposed that individuals with anorexia nervosa and bulimia nervosa develop schemas related to body and weight related information. These schemas influence the reactions of those with eating disorders, such as binge eating, purging, or self-starvation (Reas, Wisenhunt, Netemeyer, & Williamson, 2002). It is then hypothesized that body and shape concerns impair processing, which lead to the maintenance of the eating disorder. Some cognitive biases that result are attention bias, selective memory bias, selective interpretational bias, body size overestimation, and extreme drive for thinness (Williamson et al., 2004). Thus, it is the goal of cognitive behavioral therapy to bring these flawed cognitive processes to the forefront of the individual's attention so that they can be restructured (Williamson et al., 2004). At least three prevention programs have been developed which utilize the cognitive behavioral model of eating disorder development and treatment.

Stice and Agras (1998) developed a theory suggesting that the internalization of thin ideals leads to body dissatisfaction which in turn leads to negative affect and dieting behaviors which increase the risk for eating disorder symptomatology, specifically bulimic pathology. This theory has been labeled the sociocultural model of eating disorder development. Support for the model is expansive (Bradford & Petrie, 2008; Brannan & Petrie, 2008; Leung, Geller, & Katzman, 1996; Mintz & Wright, 1993; Ricciardelli & McCabe, 2004; Striegel-Moore & Cachelin, 1999). Additionally, several studies have found the sociocultural model to fit cultures outside of the United States. These include Guatemala (Vander Wal, Gibbons, & Grazioso, 2008), Mexico

(Austin & Smith, 2008), Japan, Peoples Republic of China, Taiwan, and Hong Kong

(Stark-Wroblewski, Yanico, & Lupe, 2005). While empirical support is strong for the

utility of the sociocultural model in explaining eating disorder development, it does not

include all other variables that recent research suggests might also play a role in the

onset of eating disorders. Among these variables are biological and genetic factors

(Suisman et al., 2012; Suisman et al., 2014), maternal characteristics (Le Grange et al.,

2014), interpersonal variables (Goldschmidt et al., 2014), bullying (Vartanian et al.,

2014), trauma (Groleau et al., 2012; Sachs-Ericsson et al., 2012), and emotion

dysregulation (Lavendar & Anderson, 2010). With research supporting the integration

of other variables into the sociocultural model, the field is burdened with the

responsibility of deciding which factors and variables place individuals at risk for the

onset of an eating disorder. Having inconsistent models explaining the same

phenomena makes it difficult to create prevention programs that have the correct aims

and goals for minimizing the risk for the onset of eating disorders. Nonetheless, some

prevention efforts have been taken in the field, with sparing utility.

Prevention Programs

In a meta-analysis of eating disorder prevention programs, Stice, Shaw, and

Marti (2007) found that 51% of programs (N=51) reduced eating disorder risk factors

and 29% reduced current or future eating pathology. Stice and Shaw (2004) also found

that of the 38 eating disorder prevention programs evaluated, only six produced

reductions in current or future eating psychopathology symptoms, and only two

produced effects that were replicated. Despite these disappointing statistics, several

prevention programs have been found to empirically reduce eating disorder risk and

symptomatology (Stice, Shaw, & Marti, 2007). Furthermore, the most effective

prevention programs have foundations in theoretical models of eating disorder

development. These programs include *Girl Talk* (McVey et al., 2003), *Student Bodies*

(Taylor et al., 2006), *Body Project* (Stice et al., 2006), and *Healthy Weight* (Stice et al.,

2006).

These four successful prevention programs have several factors in common.

First, each of these programs identifies young girls, ages 15-19, as the most efficient

target group to receive the program (McVey et al., 2003; Stice et al., 2006; Taylor et al.,

2006). Developmental psychopathology supports targeting this age group in prevention

efforts since the onset for eating disorders occurs during the adolescent years (Striegel-

Moore et al., 2003).   Second, each of these programs targets women, since females are

at significantly higher risk for the development of eating disorders than males (Newman

et al., 1996). Finally, the goals of the programs were to reduce eating pathology by

increasing resistance to sociocultural pressures of an ideal body, and to strengthen body

satisfaction and self-esteem (Stice, Shaw, & Marti, 2007). A summary of each of the

programs can be found below.

Girl Talk is a school-based prevention program, which seeks to improve body

esteem and global self-esteem through the use of peer support groups (McVey,

Lieberman, Voorberg, Wardrope, & Blacmore, 2003). Research suggests that young

girls are impressionable and influenced by the attitudes of their peer groups (Lieberman,

Gauvin, Bukowski, & White, 2001). For this reason, *Girl Talk* hopes to deliver a group

that will improve body and self-esteem. The group is designed to meet for 10-sessions

and is delivered by nurses trained on the manualized program, *Every BODY Is A*

Somebody (EBIS) (Seaver, McVey, Fullerton, & Stratton, 1997). EBIS was designed to teach young girls the dangers of the ideals of beauty through media literacy and to promote the importance of self-esteem. With the emphasis on media literacy to reduce the internalization of an ideal image of beauty, Girl Talk has theoretical grounding in the sociocultural model of eating disorder development. Initial findings by McVey et al. (2003) were encouraging as they showed the group led to increases in weight-related esteem and decreases in dieting and these effects remained stable at 3-month follow-up. These results are promising for the effectiveness of peer groups to decrease risk factors for eating disorder development.

Student Bodies is an 8-week, Internet based prevention program designed to prevent the onset of eating disorders in at risk populations of young women (Taylor et al., 2006). Rooted in cognitive-behavioral theory, the intervention's goals are two-fold, to reduce: 1) body dissatisfaction and 2) excessive weight concerns (Taylor et al., 2006). Program design requires participants to participate in an online discussion group, monitored by a clinical psychologist, in which they are prompted to read content and then complete assignments. This is similar to the cognitive-behavioral intervention, self-monitoring. The first results for *Student Bodies* as an effective prevention program were encouraging. Most important was that a brief, 8-week, Internet-based intervention led to reductions in weight and shape concerns in at risk, young women, which were sustained through 12-month follow-up (Taylor et al., 2006). Additionally, Taylor et al. (2006) found that a reduction in weight and shape concerns was associated with a reduction in the onset of eating disorders, a potential major finding supporting the

causal relationship between weight and shape concerns and eating disorder development.

Body Project and Healthy Weight (Stice, Shaw, Burton, & Wade, 2006) were the two programs that had effects replicated across labs, as found by Stice and Shaw (2004). Body Project is a dissonance-based program, in which the ideal image of beauty is challenged through verbal, written, and behavioral exercises. The target population for this program is at-risk girls with body image concerns (Stice, Presnell, Gau, & Shaw, 2007). The Body Project's goal is to bring about discomfort in the young girls who have internalized ideal images of beauty by challenging them with counter-attitudinal activities. It is hoped that this discomfort will motivate the at-risk girls to achieve cognitive consistency by reducing their thin-ideal internalization. Studies have found that this reduction in thin-ideal internalization then leads to reductions in body dissatisfaction, negative affect, and bulimic symptoms (Becker, Smith, & Ciao, 2005; Stice, Chase, Stormer, & Appel, 2001; Stice, Trost, & Chase, 2003). Both cognitive-behavioral and the sociocultural models of eating disorder development support the structure of the Body Project. The Body Project has been proven effective in a large-scale efficacy trial showing reduced eating pathology onset over a 3-year follow up by 60% (Stice et al., 2008), when high school staff delivers the program (Stice et al., 2009; Stice et al., 2011), and when it is presented online (Stice et al., 2012).

Healthy Weight's focus is on the promotion of lasting healthy changes to eating and exercise as the means to maintaining a healthy body weight and satisfaction in at-risk girls (Stice, Presnell, Gau, & Shaw, 2007). Participants create an individual lifestyle change plan with the support from a group facilitator and other group members.

A key component of the *Healthy Weight* intervention is the use of motivational interviewing. Previous trials of *Healthy Weight* have found that it is associated with sustained reductions in body dissatisfaction, dieting, negative affect, and bulimic symptoms (Stice et al., 2001; Stice et al., 2003).

Despite these promising results, however, eating disorders prevention programs still need to improve their efficacy by targeting the root causes and risks for eating disorders (Bulik, 2013). Having inconsistent models of eating disorder development makes it difficult to create prevention programs that accurately intervene on the most important risk variables. Additionally, the effective prevention programs discussed in this report are each targeting young, at-risk girls. Although prevalence rates are lower, young boys and minority groups increasingly also experience clinical and subclinical eating disorders. As such, prevention programs need to work to include young boys and minorities better.

The Inclusion of Minorities

Perhaps one explanation for the small representation of minorities in the field of eating disorder epidemiology, research, treatment, and prevention is that eating disorders go undiagnosed in these populations. Strictly adhering to DSM criteria could be limiting for many clinicians who serve minority populations, including men. For example, many men present with body image concerns and disordered eating behaviors but have normal weights and appear healthy. If a clinician expects to see a man present with the same diagnostic criteria as a woman, he or she might miss a clinically relevant eating disorder (Cain et al., 2012). Additionally, many minority populations do not

seek treatment for disordered eating, making it difficult to study eating disorders in these populations (Becker et al., 2010; Marques et al., 2011).

Given that prevention efforts are primarily grounded in sociocultural explanations for eating disorder development, it is important for the field to gain a clearer understanding of how everyone, including minorities internalize thin ideals. Research by Stark-Wroblewski, Yanico, and Lupe (2005) on the impact of acculturation in Japanese and Chinese international student women reveals that individuals from countries once thought to be void of the Western ideal of beauty begin to internalize thin ideals after a period of time in the United States. However, is this true for women from other countries across the globe who immigrate to America? Also important would be the exploration of how eating disorder behaviors and attitudes manifest in minority populations. For example, Latino women are more likely to binge and purge rather than restrict their food intake because of cultural factors (Franko, 2007). Gaining a broader understanding of what behaviors are more prevalent and what cultural factors might protect ethnic minorities (Warren et al., 2005) from developing an eating disorder could aid in enhancement and tailoring of prevention programs.

There also is a growing body of research devoted to eating disorders in the homosexual population. Several research studies have found higher rates of eating disorders in homosexual men than in heterosexual men (French et al., 1994; Russell & Keel, 2002). In contrast, research is still unclear as to whether or not homosexual women are susceptible to the same standards of beauty as heterosexual women; thus, are protected from eating disorder development (Barron, 1998; Brown, 1987; Lakkis, Ricciardelli, & Williams, 1999; Moore & Keel, 2003). The limited body of knowledge

about eating disorder development in the homosexual population is a concern and needs to be addressed so that preventive efforts can be inclusive.

Despite the growing research on eating disorders in men, little is being done by prevention programs to include men (Cain et al., 2012). For example, Cain et al. (2012) found that the onset of eating, weight, and shape concerns in men occurs during college. Considering prevention efforts are primarily targeted at adolescent girls, this finding encourages researchers to develop prevention programs for college-aged men. Furthermore, taking into account that weight control behaviors have increased in men over the past two decades (Chao et al., 2008), it is important to recognize gender bias as it exists in the field and to begin to include boys and men in research and prevention efforts.

Risk Factors for Athletes

Athletes are thought to be at risk for developing body image dissatisfaction and subclinical eating disorder symptoms (Petrie et al., 2009). An athlete's performance rests primarily on the ability of their body to perform at an optimal level. This pressure to perform and succeed is both internal and external, with pressures coming from the self and from coaches, peers, family, and society (Beals & Manore, 1994). Given that athletes also receive societal pressures to adhere to an ideal image of beauty, it is thought that with the addition of sport specific pressure, athletes are more at risk for body image dissatisfaction and subclinical eating disorder symptoms (Thompson & Sherman, 2010). Sport environments that stress the importance of the body in competition shift the athlete's focus on performance to the body (Anderson, Petrie, & Neumann, 2012; Coppola, Ward, & Freysinger, 2014; Kerr, Berman, & De Souza,

2006; Muscat & Long, 2008). Thus, studies have found that athletes are more willing to

engage in weight-controlling behaviors and become dissatisfied with their bodies when

they fail in competition (Sudgot-Borgen, 1994; Thompson & Sherman, 2010). Indirect

and direct pressures to have an ideal body in the broader society and specific sport are

concerning as their combination has been linked to higher levels of eating pathologies

in female athletes (Byrne & McLean, 2002). The literature also supports other factors

that may place athletes at risk for developing body image dissatisfaction and subclinical

eating disorder symptoms. The athletic environment could reinforce weight-controlling

behaviors such as excessive exercise that might lead to higher pathology (Davis &

Strachan, 2001; Thompson & Sherman, 1999). Also, competitive thinness may result in

an athlete's dissatisfaction with his/her body when he/she is compared to another athlete

(Arthur-Cameselle & Baltzell, 2012).

Furthermore, elite athletes are also motivated by external factors such as awards

and monetary compensation for their success (Anderson, Petrie, & Neumann, 2011;

Goldfield, 2009). This added layer of pressure could be an explanation for why some

research has found that elite athletes suffer from disordered eating more than

recreational athletes, as they are willing to go to greater lengths, such as weight

compensatory behaviors, to ensure their bodies perform at the highest level (Kong &

Harris, 2014; Torstveit, Rosenvinge, & Sundgot-Borgen, 2008). These behaviors might

exist more in sports that require speed or endurance (i.e. "the lighter I am, the faster and

further I will go"), scores/results given on the basis of appearance (i.e. "the thinner I

look in my uniform, the higher scores I will receive"), or are weight dependent (i.e. "I

must lose/gain five pounds to meet my weight class). However, whether or not

competition level increases an athlete's risk for developing body image dissatisfaction or subclinical eating disorder symptoms is unclear since some studies have found fewer eating pathologies in elite athletes (Hausenblas & Carron, 1999; Hausenblas & McNally, 2004).

Additionally, athletes have been found to share similar personality characteristics with those suffering from clinical eating disorders. Competitiveness, perfectionism, and goal and performance orientation are the most notable traits in athletes that are also associated with clinical eating disorders (Davis & Strachan, 2001; Parker, Lambert, & Burlingame, 1994; Streigel-Moore, Silberstein, Grunberg, & Rodin, 1990). These characteristics may place athletes at risk for eating disorder symptoms.

Gender as a Moderator of Body Image Dissatisfaction and Subclinical Eating Disorder Symptoms

Disordered eating behaviors and attitudes primarily affect women (Hudson, Hiripi, Pope, & Kessler, 2007). According to Espíndola and Blay (2006), 95% of disordered eating cases occur among women. Research by Greenleaf et al. (2009) revealed that in a sample of N=204 college athletes, *female* athletes suffered from disordered eating at a higher rate than male athletes, with 25.5% (n=52, N=204) reporting as symptomatic. In comparing male and female athletes, Engel et al. (2003) found that women had higher drive for thinness and body dissatisfaction scores, and reported more purging and restriction behaviors than men.

For this reason, most research has focused on disordered eating in women. Furthermore, *female* athletes are at heightened risk for developing disordered eating behaviors and attitudes as they are also susceptible to Western ideals of beauty for

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women (Greenleaf et. al., 2009; Kong & Harris, 2014). Therefore, female athletes rather than male athletes participating in lean, endurance, and aesthetic sports are thought to be at higher risk for developing disordered eating behavior and attitudes (Hausenblas & Carron, 1999).

However, male athletes do suffer from subclinical eating disorder symptoms, although at a lesser rate than female athletes (Hausenblas & Carron, 1999; Hausenblas & McNally, 2004) and do seem to also suffer from a gender bias in the field (Thompson & Sherman, in press). Given the potential severity of symptomatic eating disorder behaviors (i.e. negative affect, body image concerns) and the possibility they go undetected, it is dangerous and unethical to exclude male athletes in studies examining eating disorder symptoms. In fact, Sanford-Martens et al. (2007) found more male than female athletes had subclinical eating disorder symptoms. Body image concerns are also evident in male athletes (MacKinnon et al., 2003) and should be treated as seriously as those of female athletes as they could potentially lead to subclinical eating disorder symptoms (Stice, 2001). Additionally, models explaining eating disorder symptom development need to be refined and tested as they show poor fit in male athletes (Petrie et al, 2013).

Impact of Sport Type on Body Image Dissatisfaction and Subclinical Eating Disorder Symptoms

Sport type may be important in determining an athletes' level of risk for body image dissatisfaction or subclinical eating disorder symptoms. In fact, Engel et al. (2003) found that sport type accounted for the most variance in eating disorder indicators in a sample of 1445 elite Division I athletes. Research suggests that athletes

participating in lean sports that stress a thin body build, such as gymnastics, may have higher incidence of body image dissatisfaction and subclinical eating disorder symptoms than athletes participating in sports allowing normal builds, such as ball sports (Beals & Manore, 1994; Kong & Harris, 2014; Krentz & Warschburger, 2011; Swami, Steadman, & Tovée, 2009). Those in thin-build sports have been shown to possess similar characteristics as nonathletes diagnosed with clinical eating disorders, including drive for thinness, perfectionism, and perpetual dieting (Davis & Cowles, 1989; Petrie, 1993). de Bruin, Oudejans, and Bakker (2007) examined dieting behavior and body image in 17 female elite gymnasts, 51 female non-elite gymnasts, and a control group of 85 females participating in non-elite, non-aesthetic sports. They found that lean sports, in this case elite gymnasts, reported more weight controlling behaviors. Interestingly, however, this same sample of elite gymnasts identified weight-related performance pressures (e.g. "thin is going to win") rather than body image dissatisfaction as reasons for dieting (de Bruin, Oudejans, & Bakker, 2007). This finding suggests dieting and body image present differently in aesthetic sports than in non-lean sports. Disordered eating behaviors and attitudes have also been found in other lean sports including wrestling and gymnastics (Engel et al., 2003), synchronized swimming (Ferrand et al., 2009), dance, and gymnastics (Francisco, Alarcão, & Narciso, 2012),

Conversely, results from a prevalence study conducted by Greenleaf, Petrie, Carter, and Reel (2009) did not find that eating disorder symptoms were more prominent in aesthetic, lean sports. Hausenblas and Carron (2002) proposed classifying team sports into five groups: endurance (cross country, track, swimming), aesthetic

(cheerleading, diving, gymnastics, synchronized swimming), power sports (downhill skiing, crew/rowing), ball game (basketball, softball, soccer, volleyball, field hockey, lacrosse) and technical (tennis, golf). In a sample of N=204 female, collegiate athletes, separated into these five classifications, there was no significant association between sport type and eating disorder status (Greenleaf, Petrie, Carter, and Reel, 2009). Likewise, Hausenblas and McNally (2004) found that in a sample of n=217 track and field athletes, there were no sport-group differences for either eating disorder symptoms or prevalence in middle/long distance, sprinters, or field athletes. Other studies have also found that body image dissatisfaction and subclinical eating disorder symptoms did not vary by sport type (Karr et al., 2012; Kong & Harris, 2014; Voelker, Gould, & Reel, in press).

Sports as a Potential Protective Factor

Some of the research on body image dissatisfaction and subclinical eating disorder symptoms suggests that athletes are at greater risk for developing disordered eating behaviors and attitudes. Conversely, there is evidence for sports offering some protection from disordered eating behaviors and attitudes in athletes. It is possible that athletes are protected from negative affect due to the physiologic and psychological effects of exercise (Gaspar et al., 2011; Hausenblas & Fallon, 2006; Hausenblas & McNally, 2004) and that athletes actually have fewer disordered eating attitudes (e.g. body image) (Hausenblas & Downs, 2001) as their bodies fall more in line with societal standards of beauty (i.e., leanness) (Cook, Hausenblas, Tuccitto, & Giacobbi, 2011). In one study (Hulley, Currie, Njenga, & Hill,2007), Kenyan runners (n=75) were influenced by the physiological and psychological benefits of exercise as they reported

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the least eating disorder psychopathology as compared to controls and UK runners. However, this study also includes a cultural confound since the UK runners, influenced by a Western ideal of beauty, reported significantly higher levels of psychopathology and eating pathologies (Hulley, Currie, Njenga, & Hill, 2007).

Similar protective factors of sport have been found in a German study of Elite high school athletes (n=576) compared to a control group (n=291) of non-athletes (Rosendahl et al., 2009). There were no differences between athletes and non-athletes on levels of disordered eating. The researchers suggest that coach involvement might be another reason for this protective effect of sports, also supported by Francisco, Alarcão, and Narciso (2012), but they did not suggest any other plausible explanation for how sports may have been protective in their sample (Rosendahl et al., 2009).

Other studies do not support the claim that athletes are more at risk for developing subclinical eating disorder symptoms (Davis & Cowles, 1989; de Oliveira Coelho, Soares, & Ribeiro, 2010; DiBartolo & Shaffer, 2002), and, instead, find that athletes possess higher levels of body image satisfaction and less disordered eating symptoms than nonathletes (Hausenblas & McNally, 2004).

Furthermore, Estanol, Shepher and MacDonald (2013) support the idea that the mental processes of athletes might protect them from developing negative pathologies, such as eating disorders. In their sample of 205 female ballet dancers, Estanol, Shepherd and MacDonald (2013) found that mental skills, including self-confidence, weakened the relationship between negative affect and disordered eating. Thus, having access to a sport psychology consultant or a coach who teaches self-confidence may be a protective factor from body image dissatisfaction and/or eating disorder symptoms.

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This study has implications for the efficacy of mental skills as effective coping

mechanisms that could be taught in prevention programs aimed at athletes.

Rationale for Current Study

Body image disturbances are of rising public health concern. Defined as the

internal representation of one's outer appearance (Thompson, Heinberg, Altabe, &

Tantleff-Dunn, 1999), having a poor body image can lead to psychological,

psychosocial, and medical complications (Thompson et al., 1999). The most widely

accepted and researched results of body image problems are clinical and subclinical

eating disorders. Models have included sociocultural pressures, personal variables, and

relational correlates, that aim to explain the development of eating disorders in women

(Leung, Geller, & Katzman, 1996; Mintz & Wright, 1993; Striegel-Moore & Cachelin,

1999, 2001). Stice and Agras (1998) developed the sociocultural dual pathway model

describing that the internalization of thin ideal leads to body dissatisfaction which in

turn leads to negative affect and dieting behaviors which increase the risk for eating

disorder symptomatology. Research has historically focused on the causal relationship

between body dissatisfaction and disordered eating symptomatology. Better

understanding of what factors lead to body dissatisfaction would improve population-

based prevention efforts and clinical interventions alike. Most prior research conducted

on the sociocultural model has used samples of primarily female non-athletes

(Ricciardelli & McCabe, 2004). Insufficient work has explored the sociocultural model

in both male and female athletes. Examination of the relationships between body

satisfaction and the variables in the Sociocultural Dual Pathway Model could add to our

understanding by clarifying models of body dissatisfaction in athletes.

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Sociocultural theories explaining the development of body image disturbances argue for the importance of outside pressures, including media images, family, peers, and coaches (Cusumano & Thompson, 1997; Horn, 1985). Research has consistently found that the sociocultural pressure to be thin and to internalize thin ideals are strong predictors of body image concerns (Ferrand, Champely, & Filaire, 2009; Stice, 1994). This finding has been supported in research with samples of adolescent females (Pike, 1995) and college aged women (Stice, Ziemba, et al., 1996). Stice, Nemeroff, and Shaw (1996) suggest that these pressures to be thin can be divided further into the internalization of thin ideals and body image disturbances. Women who internalize thin ideals associate being thin with attributes such as happiness, desirability, and socioeconomic status (Tiggemann, 2002). According to Monro and Huon (2006), who used a sample of 72 female university students, the media portrays these idealized images, which result in higher levels of self-objectification that alter eating behaviors. In addition, Paquette and Raine (2004) found that in a sample of 44 adult women, sociocultural pressures to be thin portrayed by the media were internalized by women's social networks which continued to enforce the societal pressure to be thin and reinforced an unhealthy and unrealistic body norm. Furthermore, Bradford and Petrie (2008), in testing Stice and Agras' (1998) Socioculturally Based Dual-Pathway Model in 236 female college freshman found that levels of internalization of thin ideals were correlated with body dissatisfaction. These findings provide motivation for the current study to determine whether or not sociocultural pressures to be thin and the internalization of these ideals are significant factors when examining body satisfaction among athletes.

Researchers have investigated additional possible correlates and risk factors for body image disturbances. One prospective, longitudinal study (Paxton, Eisenberg, & Neumark-Sztainer, 2006) found that among early adolescent girls (N=440) and boys (N=366), perfectionism was identified as a psychological risk factor for the development of body dissatisfaction. Similarly, Green and Pritchard (2003) developed a model to accurately predict body dissatisfaction in adult men and women, which included perfectionism as an independent variable. Socially prescribed perfectionism has also been found to moderate the effects of body dissatisfaction on bulimic and anorexic symptoms (Brannan & Petrie, 2008). Furthermore, the potentially maladaptive personality trait of perfectionism is prevalent in athletes who often go to extremes to perfect performance (Forsberg & Lock, 2006). Perfectionism may mediate the relationship between the internalization of thin ideals and eating disorder symptomatology. Therefore, the current study will evaluate the empirical contribution of perfectionism to the model being studied.

There is a research divide on whether or not athletes are protected from or are at risk to develop body image problems. More clinical research often concludes that collegiate athletes are at risk for developing body image problems (Anderson, Petrie, & Neumann, 2011; Beals & Manore, 1994; Crissey & Honea, 2006; McClellan, 2009; Smolak, Murnen & Ruble, 2000). These researchers argue that the combination of body image problems and the dietary behaviors of athletes lead to unhealthy eating habits, perhaps due to performance in sports that require low body fat (Goldfield, 2009). Furthermore, many of the studies that have found that athletes are at greater risk for developing body image concerns suffer from methodological problems. These include

an unclear operational definition of body image, measures with poor psychometric properties, and a failure to examine level of competitiveness in athletes (Hausenblas & Downs, 2001). Research conducted with community samples often finds that athletes report more body image satisfaction than control groups (Adame et al., 1991; Hausenblas & Downs, 2001; Mackinnon et al., 2003; Robinson & Ferraro, 2004). This disagreement deserves more research attention that can add to and clarify the debate. The current study will explore the relationships between these variables as they predict body satisfaction by examining them in groups of athletes and non-athletes of both genders using structural equation modeling analyses to determine the best fitting model for predicting body satisfaction in athletes from independent variables internalization of thin ideals, perfectionism, positive affect, and negative affect.

Hypotheses

H1.   It is hypothesized that a lower-order, four factor sociocultural pathway model will best fit the data. To test the theoretical applicability of the sociocultural pathway model in the current sample, this model will contain the variables grounded in previous theory (Stice &Agras, 1998), affect, internalization of thin ideals, perfectionism, and body satisfaction. The four-factor sociocultural pathway model will present good indicators of model fit, including a high CFI (CFI>.90) and low RMSEA (RMSEA<.05).

H2a.   It is hypothesized that comparisons of the structural equation model predicting body satisfaction from perfectionism, negative and positive affect and internalization will show support for the predictive model across sex. This model will use maximum likelihood and chi-square differences test to examine model fit and will

compare model predictive paths across men and women. It is expected that the model will show good fit to the data and that predictive paths will be similar across men and women.

H2b.   As previous research suggests the possibility of sport as protective against body dissatisfaction (Gaspar et al., 2011; Hausenblas & Downs, 2001; Hausenblas & Fallon, 2006; Hausenblas & McNally, 2004), it is hypothesized that comparisons of the structural equation model will not support the model across athlete groups (competitive athletes, recreational athletes, and nonathletes), implying that other theoretical models of body satisfaction should be applied to competitive and recreational athletes.

CHAPTER 3

METHODOLOGY

Procedures

      Participants were recruited in one of the following ways: 1) through the use of

fliers posted around the University of Rhode Island's campus; 2) through the

distribution of fliers to students by professors at the University of Rhode Island; 3)

through the internet via surveymonkey.com; 4) and through email from the University

of Tennessee Knoxville athletic department (IRB approval on March 5, 2009).

Data was collected using the surveymonkey.com internet tool for collecting survey data

which was launched on February 27, 2009, following University of Rhode Island IRB

approval. This resulted in a total sample of $\underline{N}$=543.

      Participant volunteers were made aware of the content and anonymous nature of

the study and were presented with an online informed consent form. The only

exclusion criteria were for participants who were 17 years old or younger .

      Participants who consented then completed a set of seven questionnaires that

included the measures listed below, as well as demographic information. The average

time for participants to complete the survey was 15-20 minutes.

Measures

      The survey totaled 109 items beginning with demographic questions (5 items),

items from the Multidimensional Perfectionism Scale (3 items), Beliefs about

Attractiveness Scale- Revised (19 items), Body Parts Satisfaction Scale-Revised (14 items), and the Negative and Positive Affect Scale (24 items).

Only four categorical, demographic questions were of interest to the present study: gender, competitive or recreational athlete vs. non-athlete, age, and race. Tests compared female athletes vs. female non-athletes, male athletes vs. male non-athletes, female athletes vs. male athletes, and female non-athletes vs. male non-athletes on each of the following constructs.

Perfectionism was assessed using three items from the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991). These items were used from the self-oriented subscale in which individual items were measured on a 7-point Likert scale (1= strongly disagree, 7=strongly agree). Cronbach's alpha for the MPS self-orientated subscale was found by Hewitt and Flett to be α=0.89 (Hall et al., 2009). A perfectionism composite score ranging from 3-21 was calculated for each participant.

Internalization of cultural beliefs, a continuous independent variable, was measured in both groups by the 19-item Beliefs about Attractiveness Scale- Revised (BAA-R; Petrie, Rogers, Johnson, & Diehl, 1996). This scale has two underlying dimensions that measure U.S. societal values concerning attractiveness and beauty. Nine items evaluated the Importance of Being Physically Fit ("A physically fit and in-shape body reflects the beauty ideal for women") and 10 items evaluated the Importance of Being Attractive and Thin ("The thinner a woman is, the more attractive she is"). The BAA-R uses a 7 point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Petrie et al. (1996) reported internal consistency reliabilities of .85 for both factors in a sample of female undergraduates. Petrie et al. also provided evidence

for the scale's validity as both factors were significantly correlated with the Body Shape Questionnaire (Mazzeo, 1999: rs= .44 and .42, respectively), bulimic symptoms (BULIT-R: *rs= .40* and .46, respectively), and self-esteem (Rosenberg Self-Esteem Scale; Rosenberg, 1965; rs= -.29 and -.32, respectively). This scale is appropriate and valid for the research question and the sample used as it lends itself to the theoretical framework in which this research is rooted and has been tested in college samples similar to the one in the present study. The sociocultural dual pathway model traces the internalization of thin ideals as they lead to body dissatisfaction which then leads to the onset of an eating disorder. Sociocultural attitudes towards appearance must be measured in order to test the theory. A BAA-R composite score was calculated for each participant. The range of scores for the BAA-R was 19-133, with higher scores indicating a higher internalization of thin ideals.

The continuous independent variable of negative affect was measured in both groups using the 24-item Negative and Positive Affect Scale (Will, Sandy, Shinar, Yaegar, 1999). Response options were on a 5-point Likert scale with the following anchors: not at all true, a little true, somewhat true, pretty true, and very true. This measure is comprised of items from previous research on affective structure (Watson & Tellegen, 1985; Zevon & Tellegen, 1982) and consists of two scales. Wills et al. found the negative affect scale to have a Cronbach's Alphas ranging over 4 time points, of 0.88-0.91. Test-retest data for the negative affect scale found r= 0.57 for one year interval, 0.50 for two-year interval, 0.43 for three-year interval; and for positive affect r=0.37 for one year interval, 0.38 for two-year interval, and 0.30 for three-year interval (Wills, Sandy,

Yaegar, 2002). This scale is pertinent for the current study as negative affect plays a vital role in the Socioculturally Based Dual-Pathway Model. A total NPAS composite score and subscales scores on negative affect and positive affect were calculated for each participant. The range of scores for the total Negative and Positive Affect Scale was 24-120 and on subscales was 12-60. A total score and subscale scores were calculated for each participant where the lower the score on the total Negative and Positive Affect Scale reflected more negative affect states and lower scores on subscales reflected lower ratings of each type of affect, respectively.

The continuous dependent variable of body satisfaction was measured in both groups using the 14-item Body Parts Satisfaction Scale-Revised (BPSS-R; Petrie, Tripp, & Harvey, 2002). The development of this scale was strongly influenced by direct and indirect feedback with other humans and is powerfully connected to life events and changes over time. Petrie et al. (2002) found the BPSS-R to be internally consistent (α=.90) within a sample of undergraduates. Cronbach's alpha for the Brannan & Petrie (2008) study was .86. Validity of the scale was supported by significant correlations between the BPSS-R and body mass index ($r= -.32$), Multidimensional Body Self-Relations Questionnaire Appearance Evaluation Subscale ($r=.75$); T.F. Cash, 1994a), Body Shape Questionnaire ($r= -.75$, Cooper, Taylor, Cooper, & Fairburn, 1987), and Situational Inventory of Body Image Dysmorphia ($r=-.73$; T.F. Cash, 1994b). This scale measures an individual's level of satisfaction by focusing on various areas of the body that women and men normally report as problematic (i.e. stomach, upper thighs). Items are rated on a 6-point Likert scale where 1 is *extremely dissatisfied* and 6 is *extremely satisfied*. Item scores range from 1-6 where the higher scores indicate higher

satisfaction with body parts. Body Satisfaction Total scores ranged from 14-84. This scale is appropriate to the present study and sample as it serves as an indicator for the participant's level of satisfaction with his or her body. In addition, body image dissatisfaction plays an integral role in the overall theoretical framework of the socioculturally based dual-pathway model. A total BPSS-R composite score was calculated for each participant.

<u>Analyses</u>

Data analysis began with data exploration using descriptive statistics, correlations, and evaluating group differences on study variables. To examine the main effects and the interaction effect of the two categorical variables, sex and athlete group, a two-way multivariate analysis of variance was conducted on the original measures of internalization of thin ideals, negative affect, positive affect, perfectionism, and body parts satisfaction. Follow-up two way analyses of variance were run in order to further evaluate the significant main effects of sex and athlete group. Post-hoc Tukey HSD tests examined where significant mean differences existed between athlete groups.

In order to understand the structure of each measure, confirmatory factor analyses evaluated three models using the original items and factor structures of the Beliefs About Attractiveness Scale, the Negative and Positive Affect Scale, and the Body Parts Satisfaction Scale. Two-factor correlated, two-factor uncorrelated and one-factor models were conducted on measures with two factors. Unifactorial measures were modeled as such. Model fit was assessed using chi-square tests (nonsignificance indicates better fit), where CFI values (>.90) and RMSEA values (.10) indicated acceptable fit (Barrett, 2006). After initial model fits were evaluated, items with low

loadings <.50 were dropped from analyses, resulting in revised measures. Confirmatory factor analyses were then run on each of the revised measures, which were used in subsequent structural equation modeling analyses.

Once it was determined that the data met all required statistical assumptions and expectations, a base structural equation model was run followed by comparisons of this model, based on sex and athlete group. Using the revised measures and their item indicators, a structural equation model in which body satisfaction was predicted by internalization of thin ideals, negative affect, positive affect, and perfectionism was evaluated. This model was then conducted in men, women, competitive, recreational, and nonathletes and predictive path weights were examined across sex and athlete groups.

Structural equation modeling was used in the present study. In contrast to less robust regression analyses performed by Howes (2009), structural equation modeling allows for the simultaneous examination of measurement properties and the relationships between variables. Structural equation modeling has the ability to estimate measurement error, prediction error, direct and indirect effects, and it allows for the investigation of complex, well specified theoretical models with relatively unbiased regressions. For these reasons, the present study used structural equation modeling (Kline, 2005). Structural equation model results will evaluate how well variables in the model are able to predict body satisfaction in this sample. It is hypothesized that the independent variables of perfectionism, negative and positive affect, and internalization of thin ideals will significantly predict body satisfaction and will fit these data.

CHAPTER 4

FINDINGS

Participants

The total sample size was N=543. Participants were 133 (24.5%) men and 409

(75.3%) women, and one missing (0.2%), primarily recruited from two major

Universities- the University of Rhode Island and the University of Tennessee at

Knoxville. Five hundred and seventy four participants began the questionnaire and 31

(5.4%) of those participants then dropped out after completing questions leaving the

final sample of N=543. Ages of the participants ranged from 18-52 with a mean of 20

years old, and median of 20 (Table 1). The majority of the participants identified

themselves as white/Caucasian (n=481), followed respectively by Hispanic/Latino

(n=25), Black/African-American (n=20), Asian/Pacific-Islander (n=13), Native

American/Alaskan Native (n=2), and 'other' (n=2). Participants self-identified as one

of the following: competitive athlete (n=56), recreational athlete (n=192), non-athlete

(n=294), and 1 participant chose not to respond. Those who identified their sex as

'female' comprised n=35(63%) of the competitive athlete group, n=120(63%) of the

recreational athlete group, and n=253(86%) of the non-athlete group. Those who

identified their sex as 'male' comprised n=21(37%) of the competitive athlete group,

n=71(37%) of the recreational athlete group, and n=41(14%) of the non-athlete group.

Table 1

Demographic Characteristics and Scale Means

Variable	Total

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	(N=543)
	n (%)
Ethnicity	
White/Caucasian	481 (88.6)
Hispanic/Latino	25 (4.6)
Black/African-American	20 (3.7)
Asian/Pacific-Islander	13 (2.4)
Native American/Alaskan Native	2 (.4)
Other	2 (.4)
Sex	
Female	409 (75.3)
Male	133 (24.5)
Missing	1 (.2)
Athlete	
Non-Athlete	294 (54.1)
Recreational Athlete	192 (35.4)
Competitive Athlete	56 (10.3)
Missing	1 (.2)
	M (sd)
Age	20.07 (7.82)
Internalization Thin Ideals	71.13 (15.93)
Neg. Affect	31.34 (9.66)
Pos. Affect	28.78(7.92)
Perfectionism	12.95 (3.99)
Body Satisfaction	53.46 (11.13)

The various sports that both competitive (n=56) and recreational (n=192) athletes listed included the following: basketball, soccer, endurance running, dodgeball, fencing, martial arts, figure skating, yoga, lacrosse, softball, the gym/general exercise, field hockey, kayaking, rock climbing, dance, billiards, rowing, sailing, biking, kickboxing, aerobics, underwater hockey, gymnastics, baseball, football, volleyball, tennis, swimming, flag football, hockey, surfing, whiffle ball, strength training/body building, track, hiking, roller skating, wrestling, cheerleading and ballet

The remaining (n=294) participants were non-athletes. The data from the non-athlete group was used as comparison to the data from the athletes.

Initial data analysis examined means and standard deviations of the overall sample for each demographic variable, original predictor variables, and the original dependent variable (see Table 1). Percentages and standard deviations were examined by sex (Table 2). Chi-squared analyses revealed that race/ethnicity did not vary by sex ($X^2 (5)=9.94$, $p=.08$), however athlete group did vary by sex ($X^2 (2)=39.31$, $p<.001$). Age was not statistically significantly different between different sex participants ($F(26,514)=1.22$, $p=.22$) Percentages and standard deviations were also examined by athlete group (Table 3). Chi-squared analyses revealed that race/ethnicity did vary significantly by athlete group ($X^2 (10)=18.58$, $p<.05$). Age was not statistically significantly different across athlete groups ($F(26,514)=0.80$, $p=75$). Pearson correlations were also examined for each variable and are presented in Table 4.

Table 2

Demographics by Sex

Variable	Men (N=133)	Women (N=409)
	N (%)	N (%)
Race/Ethnicity		
White/Caucasian	112 (84.2)	368 (90.0)
Hispanic/Latino	7 (5.3)	18 (4.4)
Black/African-American	8 (6.0)	12 (2.9)
Asian/Pacific-Islander	3 (2.3)	10 (2.4)
Native American/Alaskan Native	1 (.8)	1 (.2)
Other	2 (1.5)	0
Athlete Group*		
Non-Athlete	41 (30.8)	253 (61.9)
Recreational Athlete	71 (53.4)	120 (29.3)
Competitive Athlete	21 (15.8)	35 (8.6)
Missing		

		M (sd)
Age	18.51 (8.9)	20.59 (7.4)

*Chi-squared analysis of Athlete Group By Sex was significantly different.

Table 3

Demographics by Athlete Group

Variable	Non-Athlete (n=294)	Recreational Athlete (n=192)	Competitive Athlete (n=56)
	N (%)	N (%)	N (%)
Race/Ethnicity*			
White/Caucasian	251 (85.4)	179 (93.2)	50 (89.3)
Hispanic/Latino	19 (6.5)	6 (3.1)	0 (0)
Black/African-American	12 (4.1)	6 (3.1)	2 (3.6)
Asian/Pacific-Islander	10 (3.4)	1 (.5)	2 (3.6)
Native American/Alaskan Native	1 (.3)	0	1 (1.8)
Other	1 (.3)	0	1 (1.8)
Sex*			
Female	253 (86.1)	120 (62.5)	35 (62.5)
Male	41 (13.9)	71 (37.0)	21 (37.5)
Missing	0	1 (.5)	0
	M (sd)	M (sd)	M (sd)
Age	20.42 (6.90)	19.81 (9.32)	19.11 (6.74)

* Chi-squared analyses of Race/Ethnicity by Athlete Group and Sex by Athlete Group were significantly different.

Table 4

Pearson Correlations of all Variables in Full Sample (N=543)

	Age	Internal	Perfect	Neg. Aff.	Pos. Aff.	Satisfact
Age	1	-.030	.021	-0.05	-.003	-.032
Internal		1	.308**	.123**	.176**	-.189**
Perfect			1	.263**	.219**	-.082
Neg. Aff.				1	.398**	-.272**
Pos. Aff.					1	-.390**
Satisfact						1

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Two-Way Multivariate analysis of variance (MANOVA) was used to determine if the means of the original constructs internalization, negative affect, positive affect, perfectionism, and satisfaction, were influenced by athlete group (nonathlete, recreational, competitive) and sex. Results revealed a significant multivariate main effect for athlete group, Wilks' Λ=.932, $F(2,535)$=3.79, p<.001, η^2=.035, and for sex, Wilks' Λ=.968, $F(1,535)$=3.479, p<.01, η^2=.032. The multivariate interaction between athlete group and sex was not significant, Wilks' Λ=.983, $F(2,535)$=.884, p=.548, η^2=.008.

Follow-up two-way ANOVAs were conducted to test the effect of sex and athlete group on internalization, negative affect, positive affect, perfectionism, and satisfaction and main effects are summarized in Tables 5 and 6. The ANOVA for internalization showed no significant main effect of sex, $F(1, 535)$=2.30, p=.13, nor athlete group, $F(2, 535)$=0.12, p=.89. The interaction between sex and athlete group was not significant, $F(2, 535)$=1.61, p=.20. The ANOVA for negative affect showed a significant main effect of sex, $F(1, 535)$=4.56, p<.05, but not for athlete group, $F(2, 535)$=1.66, p=.19. The interaction between sex and athlete group was not significant, $F(2, 535)$=0.47, p=.62. The ANOVA for positive affect showed no significant main effect of sex, $F(1, 535)$=0.00, p=.95, but did show a significant main effect for athlete group, $F(2, 535)$=4.49, p<.05. The interaction between sex and athlete group was not significant, $F(2, 535)$=1.05, p=.35. The ANOVA for perfectionism showed a significant main effect of sex, $F(1, 535)$=4.03, p<.05, and athlete group, $F(2, 535)$=7.91, p<.001. The interaction between sex and athlete group was not significant, $F(2,$

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535)=0.14, *p*=.87. The ANOVA for satisfaction showed a significant main effect of sex, *F*(1, 535)=5.72, *p*<.05, and athlete group, *F*(2, 535)=5.69, *p*<.01. The interaction between sex and athlete group was not significant, *F*(2, 535)=1.68, *p*=.19.

Post hoc comparisons using the Tukey HSD test indicated that significant differences were found between competitive and recreational athletes on the perfectionism scale, (M= 2.14, SD=.60*),* and between competitive and nonathletes, (M=2.83, M=0.57) finding that the more competitive the athlete, the more perfectionistic. Significant differences were also found between recreational and nonathletes on the satisfaction scale, (M=3.64, SD=0.91), finding that the nonathletes showed less satisfaction with their bodies than the recreational athletes. Significant differences were found between recreational and nonathletes on the positive affect subscale (M=-2.53, SD=0.73), finding that recreational athletes had less positive affect than nonathletes.

Table 5

Mean Comparisons on Original Constructs for Men (n=133) and Women (n=409)

	Men		Women			
	M	SD	M	SD	*F* (1,535)	η^2
Internal	73.72	15.08	70.31	16.14	2.30	.004
Neg. Aff.	29.23	9.41	31.93	9.67	4.56*	.008
Pos. Aff	27.67	7.99	29.06	7.88	0.00	.000
Perfect	13.89	3.82	12.64	4.00	4.03*	.007
Satisfact	44.62	10.55	40.47	9.45	5.72*	.011

*p<.05

Men had statistically significantly higher scores on perfectionism and body satisfaction than women, and significantly lower scores on negative affect than women, indicating more negative affect. Effect sizes were very small.

Post hoc comparisons using the Tukey HSD test indicated that significant differences were found on the perfectionism scale between competitive and recreational athletes and between competitive and nonathletes, reflecting that more competitive athletes were more perfectionistic. Significant differences were also found on the body satisfaction scale between recreational and nonathletes reflecting that nonathletes showed less satisfaction with their bodies than recreational athletes. Significant differences were also found on the positive affect subscale between recreational and nonathletes reflecting that recreational athletes had less positive affect than nonathletes.

Table 6

Mean Comparisons on Original Constructs for Competitive (n=56), Recreational (n=192) and Nonathletes (294)

	Comp		Rec		Non			
	M	SD	M	SD	M	SD	F (2, 535)	η^2
Internal	73.4	18.0	71.6	14.1	70.4	16.7	0.12	.000
Neg. Af	30.5	9.30	29.8	9.10	32.4	10.0	1.66	.006
Pos. Af	27.3	9.12	27.4 [a]	7.61	29.9 [b]	7.71	4.49*	.017
Perfect	15.2 [a]	3.9	13.1 [b]	3.5	12.4 [c]	4.1	7.91***	.029
Satisfact	42.5	11.0	43.6 [a]	9.40	39.9 [b]	9.72	5.69**	.021

Note: Comp=Competitive, Rec=Recreational, Non=Nonathlete; Different superscripts reflect significant group differences in Tukey HSD follow-up tests.
*p<.05
**p<.01
***p<.001

Confirmatory Measurement Models

Confirmatory factor analyses were conducted on the original factor structure for each measure in order to examine the reported factor structures and fit of the sociocultural pathway model constructs in the current sample. Three models, which included two factor-correlated, two-factor uncorrelated, and one factor-models were examined for the Beliefs About Attractiveness Scale, the Negative and Positive Affect

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Scale and the Body Parts Satisfaction Scale. Model fit was low in each model for all measures, and, as a result, items with factor loadings <.50 were dropped from the measures in order to improve model fit. Using the results from the confirmatory factor analyses, a structural equation model was conducted in order to determine the models' fit to the data. Finally, the predictive structural equation model will be conducted in each group; men vs. women, and competitive vs. recreational vs. nonathlete, in order to examine the models' fit across sex and athlete groups.

Measurement Models

Confirmatory factor analysis (CFA) is often used to test established theories (Meyers et al. 2006). CFA was used to examine previously reported measurement structures' fit in this sample. One factor loading for each factor was arbitrarily set to one in order to standardize the factor loadings. Three models, two-factor correlated, two-factor uncorrelated, and one factor, were compared for measures assessing internalization, negative and positive affect, and body parts satisfaction. Model fit was assessed using chi-square tests (nonsignificance indicates better fit), where CFI values (>.90) and RMSEA values (.05) indicated acceptable fit (Barrett, 2006). A summary of the measurement model findings based on the CFAs using the original items/structures of each measure in this sample can be found in Tables 7-9.

The confirmatory factor analyses for the Internalization of Thin Ideals scale produced poor fit for the original two-factor correlated model (χ^2 (134)= 771.89, $p<.0001$, CFI=0.79, RMSEA=.09, SRMR=0.07), the two-factor uncorrelated model (χ^2 (135)= 1262.92, $p<.0001$, CFI=0.62, RMSEA=.12, SRMR=0.21), and the one factor model (χ^2 (135)= 775.97, $p<.0001$, CFI=0.79, RMSEA=.09, SRMR=0.07) (Table 7).

The confirmatory factor analyses for the Negative and Positive Affect Scale produced poor fit for the two-factor correlated model (χ^2 (251)= 1431.10, $p<$.0001, CFI=0.82, RMSEA=.09, SRMR=0.07), the two-factor uncorrelated model (,χ^2 (252)= 1538.00, $p<$.0001, CFI=0.80, RMSEA=.10, SRMR=0.16), and the original one factor model (χ^2 (252)= 3068.51, $p<$.0001, CFI=0.57, RMSEA=.14, SRMR=0.13) (Table 8). The confirmatory factor analyses for the Beliefs About Attractiveness Scale produced low but acceptable fit for the original two-factor correlated model (χ^2 (43)= 342.97, $p<$.0001, CFI=0.90, RMSEA=.11, SRMR=0.16), but poor fit for the two-factor uncorrelated model (χ^2 (44)= 471.74, $p<$.0001, CFI=0.86, RMSEA=.13, SRMR=0.20), and the one-factor model (χ^2 (44)= 636.86, $p<$.0001, CFI=0.80, RMSEA=.16, SRMR=0.10) (Table 9).

Table 7
CFA Results Summary for Internalization of Thin Ideals Scale- Original

Model Type	X^2	df	CFI	RMSEA
Two-Factor Correlated	771.89	134	0.79	0.09
Two-Factor Uncorrelated	1262.92	135	0.62	0.12
One-Factor	775.97	135	0.79	0.09

Table 8
CFA Results Summary for Negative/Positive Affect Scale- Original

Model Type	X^2	df	CFI	RMSEA
Two-Factor Correlated	1431.10	251	0.82	0.09
Two-Factor Uncorrelated	1538.00	252	0.80	0.10
One-Factor	3068.51	252	0.57	0.14

Table 9
CFA Results Summary for Body Parts Satisfaction Scale- Original

Model Type	X^2	df	CFI	RMSEA
Two-Factor Correlated	342.97	43	0.90	0.11
Two-Factor Uncorrelated	471.74	44	0.86	0.13
One-Factor	636.86	44	0.80	0.16

After conducting confirmatory factor analyses using original factor structures,

model fits remained poor. Model fits improved for some measures using an item

loading cutoff of 0.40. Finally, a more conservative item loading cutoff of 0.50 was

applied to each measure. Table 10 displays the final items that were retained for each

construct measure. Items, ranges, and alphas for final revised scales and subscales are

reported in Table 11.

Table 10
Standardized Factor Loadings of Items Retained for Analyses

Items and scales	Loadings
Perfectionism	
If I fail slightly, it is as bad as being a complete failure	.66
I hate being less than the best at things	.85
I expect higher performance in me than most people	.65
Internalization	
Fit Subscale	
Overweight men and women lack self-control	.65
Physically fit is directly related to attractiveness	.61
More physically fit, more likely have a romantic partner	.56
Important for men and women to be physically fit	.61
Overweight men and women should be embarrassed	.61
Physically fit and in-shape reflects the beauty ideal for men and women	.51
Physically fit and in-shape men and women have more self-confidence	.63
Attractive/Thin Subscale	
Date thin rather than overweight men and women	.53

Not important for overweight men and women to spend on clothes   .51
The heavier, the less attractive   .65
Attractive men and women are smarter than unattractive   .63
Attractive men and women lead more fulfilling lives   .64

<div align="center">Negative Affect</div>

Tense   .61
Afraid   .61
Dissatisfied   .64
Weak   .59
Sad   .74
Worried   .71
Hostile   .58
Nervous   .71
Irritated   .66
Angry   .68
Depressed   .74
Upset   .77

<div align="center">Positive Affect</div>

Cheerful   .72
Satisfied   .70
Enjoyment   .82
Interested   .61
Happy   .85
Alert   .52
Confident   .68
Friendly   .56
Energy   .67
Relaxed   .58

<div align="center">Satisfaction</div>

Weight   .58
Arms   .75
Stomach   .77
Buttocks   .64
Hips   .74
Upper Thighs   .77
Muscle Tone   .82

Table 11

Items, Range and Alpha's for Revised Scales and Subscales

Construct-Scale Subscale	Number of Items	Range	Cronbach Alpha
Internalization Thin Ideals- Rev.	13	13-91	.85
Being Fit	8	8-56	.77
Being Attractive/Thin	5	5-35	.70

Negative and Positive Affect-Rev.			
Negative Affect-Rev.	12	12-60	.91
Positive Affect-Rev.	10	10-50	.89
Perfectionism	3	3-21	.76
Body Parts Satisfaction-Rev.	7	7-42	.90

Six items, one from the Physically Fit subscale and five from the Attractive and Thin subscale, were excluded from the Internalization of Thin Ideals Scale (Internal). Fit indices showed low-adequate model fit for the revised, two-factor correlated model, χ^2 (53)= 289.21, $p<.0001$, CFI=0.88, RMSEA=.09, SRMR=0.06 (Table 10). In this model, the correlation between the fit and attractive and thin subscales was r=0.92

Two items from the Positive Affect subscale were cut due to low loadings (affect). The original one factor structure of the Negative and Positive Affect Scale was not retained for analyses, as model fit was unacceptably poor. Therefore, a two-factor correlated factor structure was retained for the revised confirmatory factor analysis, and structural equation model. In this model, the correlation between negative and positive affect subscales was r=0.46. Fit indices showed low-adequate model fit, χ^2 (208)= 1147.62, $p<.0001$, CFI=0.85, RMSEA=.09, SRMR=0.07 (Table 11).

Seven items, three from the overall body parts satisfaction subscale and four from the satisfaction with face subscale were cut from the Body Parts Satisfaction Scale (Satisfact). Fit indices showed good model fit, χ^2 (14)= 230.38, $p<.0001$, CFI=0.90, RMSEA=.17, SRMR= 0.06. Seven items were cut from the final CFA results (Table 12). Four of these items represented the satisfaction with face subscale. Therefore, in this sample, one factor, the overall body parts satisfaction subscale, formed the factor reflecting Body Satisfaction.

Table 12
CFA Results Summary for Internalization of Thin Ideals Scale- Revised

Model Type	X^2	df	CFI	RMSEA
Two-Factor Correlated	289.21	53	0.88	0.09

Table 13
CFA Results Summary for Negative/Positive Affect Scale- Revised

Model Type	X^2	df	CFI	RMSEA
Two-Factor Correlated	1147.62	208	0.85	0.09

Table 14
CFA Results Summary for Body Parts Satisfaction Scale- Revised

Model Type	X^2	df	CFI	RMSEA
One-Factor	230.38	14	0.90	0.17

Structural Equation Model

To examine hypothesis 1, a structural equation model predicting Satisfaction from Internal, Perfect, Negative Affect, and Positive Affect was examined. Figure 1 illustrates the hypothesized sociocultural pathway model (H1). Using the revised scales, the model demonstrated low-adequate fit, χ^2 (806)= 2398.63, $p<.0001$, CFI=0.85, RMSEA=0.06, SRMR= 0.06. Results indicated that perfectionism, internalization of thin ideals, negative and positive affect accounted for R^2=.14, 14% of the variance in body satisfaction.
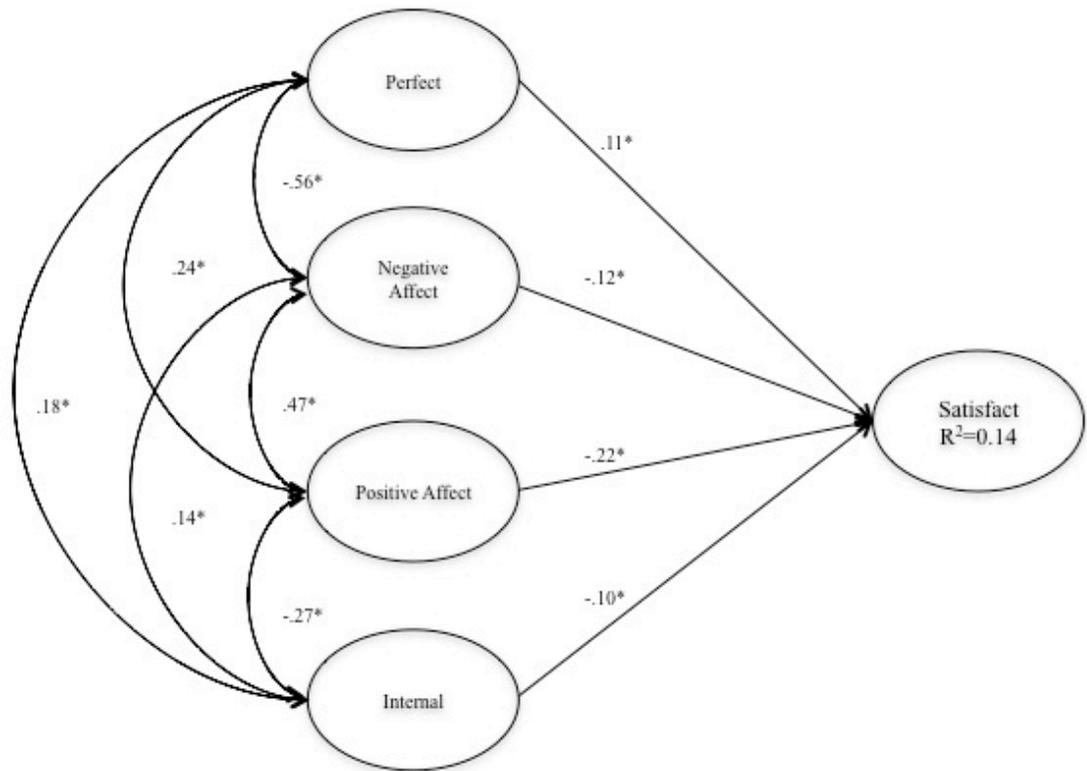
Figure 1. Structural Equation Model Predicting Body Satisfaction from Perfectionism, Negative Affect, Positive Affect, and Internalization

χ^2 (806)= 2398.63, $p<.0001$, CFI=0.85, RMSEA=.06, SRMR=0.06

To test hypothesis 2b, fit indices and predictive paths were examined in each group, men vs. women, and competitive vs. recreational vs. nonathletes, using the structural equation model predicting body satisfaction from perfectionism, negative affect, positive affect, and internalization. For the analyses of sex, males (n=133) and females (n=409) were defined. For the analysis of athlete group, competitive (n=56), recreational (n=192), and nonathletes (n=294) were defined.

Structural equation modeling was used examine group differences using EQS 6.1 software (Bentler, 2007). Fit indices used to analyze the fit of invariance include the Chi-Square Difference Test, Comparative Fit Index (CFI), and Root Mean Squared

Error of Approximation. CFI values (>.90) and RMSEA values (.10) indicated

acceptable fit (Barrett, 2006).

Sex

    The model had adequate fit in males, $(\chi^2 (806)= 1535.36, p<.0001, CFI=0.80,$

RMSEA=.07) and adequate fit in women, $(\chi^2 (806)= 2261.24, p<.0001, CFI=0.84,$

RMSEA=.05). Results indicated that perfectionism, internalization of thin ideals,

negative and positive affect accounted for $R^2=.15$, 15% of the variance in body

satisfaction in both men and women separately.

Athlete Group

    The model also an adequate fit in recreational athletes, $(\chi^2 (806)= 1603.33,$

$p<.0001$, CFI=0.80, RMSEA=.07) and nonathletes, $(\chi^2 (806)= 1851.45, p<.0001,$

CFI=0.85, RMSEA=.06). However, model fit was poor in competitive athletes, $(\chi^2$

$(806)= 1593.63, p<.0001, CFI=0.57, RMSEA=.12)$ likely due to sample size

limitations. Therefore, competitive and recreational athlete subsamples were combined.

Model fit for the collapsed athlete group was adequate, $(\chi^2 (806)= 1699.14, p<.0001,$

CFI=0.83, RMSEA=.06).

Table 15

Goodness-of-fit Statistics for Prediction Model Across Sex and Athlete Group

Model	x^2	df	CFI	RMSEA
Sex				
Men	1535.36	806	0.80	0.07
Women	2261.24	806	0.84	0.06
Athlete Group				
Collapsed Athlete Group	1699.14	806	0.83	0.06
Nonathletes	1851.45	806	0.85	0.06

Figure 2. Structural Equation Model Predicting Body Satisfaction from Perfectionism, Negative Affect, Positive Affect, and Internalization in Men and in Women
Key: Loadings for Men/Loadings for Women

Men: χ^2 (806)= 1535.36, p<.0001, CFI=0.80, RMSEA=.07
Women: χ^2 (806)= 2261.24, p<.0001, CFI=0.84, RMSEA=.05
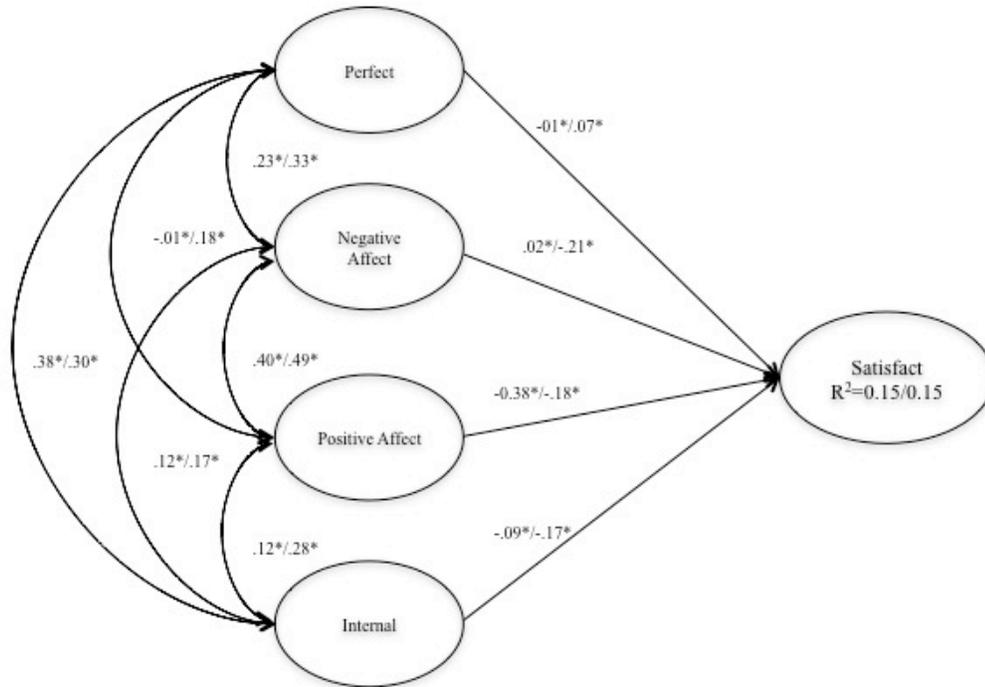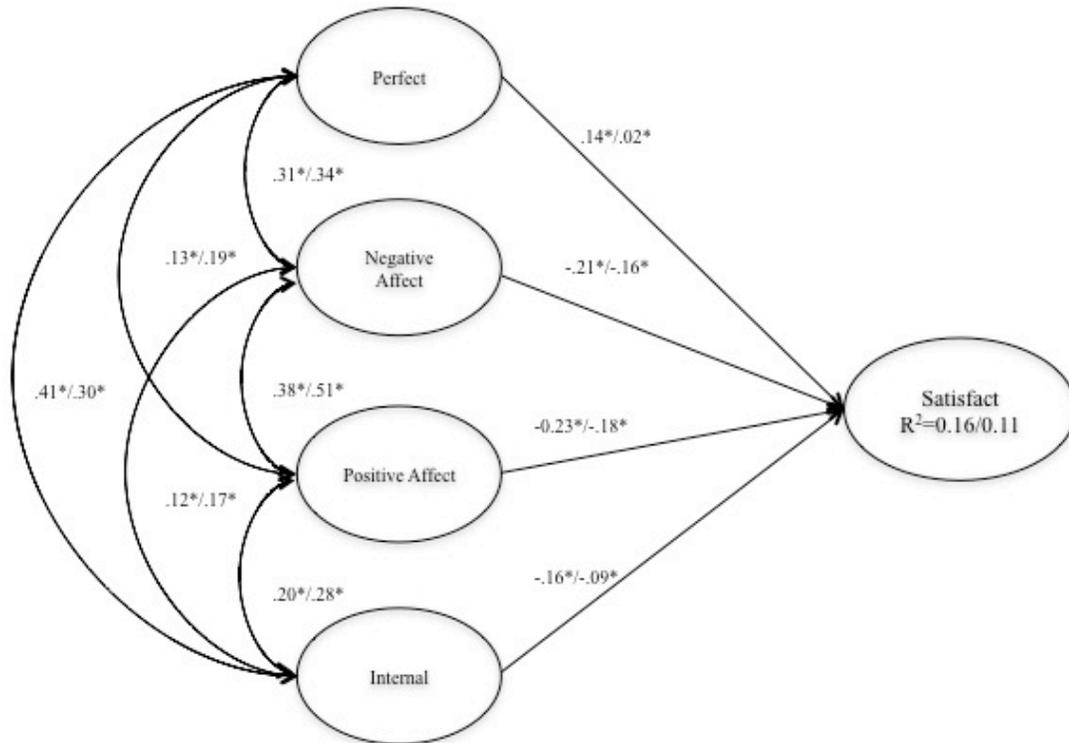
Figure 3. Structural Equation Model Predicting Body Satisfaction from Perfectionism, Negative Affect, Positive Affect, and Internalization in Collapsed Athlete Group and Nonathlete Group
Key: Loadings for Athletes/Loadings for Nonathletes

Collapsed Athlete Group: χ^2 (806)= 1699.14, p<.0001, CFI=0.83, RMSEA=.06
Nonathletes: χ^2 (806)= 1851.45, p<.0001, CFI=0.85, RMSEA=.06

CHAPTER 5

CONCLUSION

The purposes of this study were two fold; to (1) test a hypothesized multidimensional measurement model of body satisfaction based on the sociocultural pathway model, and (2) to examine the applicability of this model for (2a) men and women, and (2b) competitive, recreational, and non-athletes.

Initial confirmatory factor analysis results did not support the hypothesis that the sociocultural model constructs would show good fit to the data. After excluding items with poor factor loadings (<.50), the revised scales showed improvements in fit using a revised factor structure, supporting the sociocultural measurement model. Specifically, there were high loadings on each of the measures, with no substantive cross-loadings and good fit for each of the measurement constructs. Two notable findings during the measurement revision process include the a) poor model fit for the original one factor structure of the Negative and Positive Affect Scale, and the b) poor support for a two-factor correlated model for the Body Parts Satisfaction Scale. As a result, the construct originally labeled as "affect" was separated into two distinct constructs: negative and positive affect, supporting a revised two-factor correlated factor structure. Additionally, the latent variable "satisfaction" was measured by one of the two original subscales, the overall body parts satisfaction subscale. Implications for these findings are that scales meant to measure a single, latent variable of affect using positive and negative markers should be evaluated structurally before assuming perfect correlation between positive

and negative constructs. Furthermore, results in this sample indicated that body satisfaction was measured by satisfaction with the overall body separate from the face, indicating that a separate measurement construct should be used when evaluating a participant's satisfaction with his/her face.

Thus, it can be concluded that the measurement model using the factors of the sociocultural pathway model were minimally supported and that the results are grounded in the sociocultural pathway theory in which variables such as internalization of thin ideals, perfectionism, and negative and positive affect lead to body image dissatisfaction. According to the SCD model but not evaluated in these data, such a process could lead to the development of a subclinical or clinical eating disorder. The structural equations model evaluated in this study produced factor loadings which revealed that perfectionism accounted for 1.2% of the overall variance in body satisfaction, internalization accounted for 1% of the overall variance in body satisfaction, negative affect accounted for 1.4% of the overall variance in body satisfaction, and that positive affect accounted for 4.8% of the overall variance in body satisfaction. These findings suggest that, consistent with the overall multivariate effect size being small (R^2=0.14), perfectionism, negative affect, positive affect, and internalization of thin ideals were also small cross-sectional predictors of body satisfaction in male and female athletes and nonathletes, with positive affect showing the strongest predictive path. Positive and negative affect showed the strongest loadings in the model which supports existing theory that affect and disordered eating behaviors/attitudes may have a cyclical relationship. However, longitudinal designs and analyses would be needed to draw this conclusion. Additionally, there is considerably

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more room to explain variance in these factors than were accounted for by this model. It is possible that other factors such as pressures from coaches and parents, or extrinsic motivations to succeed could be more appropriate variables to include in future versions of this theoretical model. Suggestions for theoretical considerations in expanding the model are discussed later in this chapter.

The second main finding was that the multigroup analysis provided sufficient evidence that the predictive model had adequate fit in each of the groups, and that predictive paths worked similarly across sex and athlete group. This indicates there is evidence for invariance of predictive paths across sex and athlete groups. However, although the model accounted for the same amount of variance (R^2=0.15) in men and women, there were important differences across the predictive paths. Specifically, differences were noted in the directionality of perfectionism, where the predictive path from perfectionism to satisfaction was negative for men, and for negative affect, where the predictive path from negative affect to satisfaction was negative for women. These differences indicate that for men, less perfectionism was related to more body satisfaction and that, for women, more negative affect was related to lower body satisfaction.

Previous research findings that sport offers a possible protective factor against body dissatisfaction in athletes led to the null hypothesis that the predictive paths would be similar across athlete groups would be rejected; thus, the structural equation model would not be similar across athlete groups. Additionally, previous analyses on the current data sample (Howes, 2009) found that women scored higher on two measures of eating disorder symptoms than men and that female non-athletes scored highest on the

measure for bulimia while female competitive athletes scored highest on the measure

for anorexia. This difference in mean scores between measures meant to assess two

different eating disorders show that the pathways and constructs predicting eating

disorders may differ with each disorder and, in this sample, the means differed across

athlete groups. These previous results supported the current hypothesis that the

predictive paths would not be similar across athlete groups. Results did support this

hypothesis. Although initial model fit was poor for competitive athletes, collapsing

athlete groups resulted in adequate model fit for athletes, accounting for (R^2=0.16) of

the overall variance in body satisfaction. Model fit was also adequate in nonathletes,

however, accounting for less overall variance (R^2=0.11) in body satisfaction. There

were also notable differences in the predictive paths between athletes and nonathletes.

In athletes, perfectionism accounted for 1.4% of the variance in satisfaction as

compared to 0.2% for nonathletes; in athletes, negative affect accounted for 2.1%

versus nonathletes at 1.6% of the variance in satisfaction; in athletes, positive affect

accounted for 2.3% versus nonathletes at 1.8% of the variance in satisfaction; and, in

athletes, internalization accounted for 1.6% versus nonathletes at 0.9% of the variance

in satisfaction. Each of the predictive paths accounted for more variance in the athlete

group when compared to the nonathlete group. Despite the differences in predictive

path weights, the directionality of the weights was similar across athletes and

nonathletes. Meaning, the more a participant endorsed being perfectionistic, the more

they reported being satisfied with their bodies; the less depressed/endorsing negative

affect, the more they reported being satisfied with their bodies; the less happy/feelings

of positive affect, the more they reported being satisfied with their bodies; and the less

internalization of thin ideals, the more they reported being satisfied with their bodies. Each of these is consistent with the sociocultural theory, except for positive affect which seems to contradict theory that positive affect offers a buffer against body dissatisfaction.

Although the multigroup comparisons of the predictive model supported the similar predictive paths across groups in this sample, the effect size for the structural model in the overall sample was small. The field of body satisfaction and disordered eating behaviors/attitudes in athletes is in need of expanded measurement models to include constructs that more powerfully predict body dissatisfaction. As highlighted in the current research, research found direct relationships between body image dissatisfaction and eating disorder symptoms in athletes. However, Anderson, Petrie, and Neumann (2011) found that body dissatisfaction was unrelated to dietary restraint in their sample of swimmers and gymnasts. This may reflect that subclinical eating disorder symptoms in female athletes participating in weight-conscious sports who may choose to restrict their eating as a result of sport related pressures even if they are satisfied with their bodies (Anderson, Petrie, and Neumann, 2011). Ferrand et al. (2009) found similar results in their sample of rhythmic gymnasts, of which 37.5% were at risk for developing disordered eating, according to EAT-26 scores, yet were satisfied with their appearance. These findings suggest that more research is needed to critically examine models that propose a direct relationship between body image dissatisfaction and disordered eating in athletes. For this reason, the sociocultural model of eating disorder development may be too simplistic in determining how disordered eating behaviors manifest in athletes (Fallon & Hausenblas, 2005). Additionally, such results

have implications for future research on disordered eating symptoms after athletes leave the sport, whether due to end of season, injury, or retirement (Papathmoas & Petrie, in press). If an athlete's motivation for weight controlling behaviors is to have a body that will lead to optimal performance and is unrelated to body image dissatisfaction, will those behaviors continue once an athlete is in the off-season, is injured, or retired? Or is it possible that eating disorder behaviors begin during an athlete's career and then become clinically significant over time, especially during retirement, as seen in two studies of retired gymnasts (Kerr, Berman, & De Souza, 2006; Stirling, Cruz, & Kerr, 2012)? Taking into account that involuntary retirement of an athlete can lead to increased anxiety and depression and decreased self-respect and control (Martin, 2014), would athletes entering into retirement be at greater risk for developing clinically relevant eating disorders? Would periods of injury also place athletes at risk given the stress, panic, and fear caused by an injury (Lynch, 1988; Quinn & Fallon, 1999; Tracey, 2003; Williams & Andersen, 1998)? For these reasons, it is strongly suggested that longitudinal research be conducted to determine a) whether or not weight-controlling behaviors carryover into the off season, periods of injury, and retirement and, if so, 2) the role of body image dissatisfaction in subclinical eating disorder symptoms during the off season, periods of injury, and retirement.

Possibly the most important feature of the construct of body satisfaction and disordered eating behaviors/attitudes in athletes is that they have not been operationally defined very well. Many studies argue that athletes might have a higher degree of disordered eating behaviors and attitudes than the nonathlete population, yet these studies use different outcome measures to test the same construct (Garner & Garfinkel,

1980; Hausenblas & Carron, 1999). For example, disordered eating can be evaluated using the non-clinically derived Eating Attitudes Test (Garner & Garfinkel, 1979) and Eating Disorder Inventory (Garner, Olmstead, & Polivy, 1983) or the clinically derived Eating Disorder Examination Interview (Cooper & Fairburn, 1987). Each of these assessments measures symptoms differently. Studies which claim to diagnose or label athletes as "eating disordered" using the EAT or the EDI do so inaccurately since these measures were not constructed using DSM criteria and since clinical diagnoses require clinical interviews. Therefore, without psychometrically sound agreed-upon measures, how can the field draw any conclusions about whether athletes are at greater risk for disordered eating than nonathletes? The lack of one well-developed instrument to measure disordered eating is one explanation for the wide range of prevalence rates of subclinical eating disorder symptoms in athletes ranging from 0%-2% for anorexia nervosa, 1.1%-6% for bulimia nervosa (Petrie et al., 2009). Thus, the field of sport psychology should develop a psychometrically sound and sensitive measure that can accurately identify body satisfaction and disordered eating symptoms, as they exist specifically in athletes. This measure would be sensitive to the sporting environment, including pressures from coaches and teammates, and would recognize the variability between sports by including sport specific questions (i.e. a thin body in ballet is a sign of professional achievement; wrestlers often need to engage in behaviors to make weight). If such a measure were developed and validated, the field could accumulate both a more accurate understanding of how subclinical eating disorder symptoms manifest in athletes and more precise estimates of prevalence rates.

Similarly, the field is in need of measures that accurately evaluate the construct of body image dissatisfaction (Fiske, Fallon, Blissmer, & Redding, 2014). As demonstrated in the current study, the items that accurately measured the latent variable of body satisfaction needed substantial revision compared to the originally published scale (BPSS-R; Petrie, Tripp, & Harvey, 2002). Sport psychology is also in need of refined and psychometrically sound instruments to accurately measure body dissatisfaction, as suggested by Fiske, Fallon, Blissmer, and Redding (2014) in their review of body dissatisfaction prevalence in U.S. adults.

The current research supports the need to expand body image and eating disorder development models beyond the sociocultural theory to incorporate more expansive models, such as Bronfenbrenner's ecological systems theory (Broderick & Blewitt, 2010). In order to adequately treat an athlete, it is vital that the field recognize the many systems that influence an individual, including families, peers, and the broader society (i.e. the microsystem, mesosystem, exosystem, and macrosystem). It is possible that an ecological approach will also contribute to further understanding of how variables like gender, pressures from society and coaches, age, nationality, and other psychopathology interact and lead to body image dissatisfaction or disordered eating in athletes. Studies by Shanmugam, Jowett, and Meyer (2013) and Karr et al. (2013) have examined both interpersonal and intrapersonal factors in athlete body dissatisfaction and eating psychopathology development and yield promising results for the broadening of models beyond the sociocultural model. Fallon and Hausenblas (2005) previously criticized the sociocultural model for its failure to explain why not all who internalize ideal images develop an eating disorder. Perhaps the incorporation of

Bronfenbrenner's ecological model to quantitative and qualitative research on body image dissatisfaction and subclinical eating disorder development in athletes will help tease out the many unanswered questions of their etiology and lead to more refined professional services for the treatment of athletes.

Future Directions and Limitations

Although prevention programs do exist that have empirical support, the field is in need of more research in the area of prevention. Furthermore, prevention efforts have been thwarted by the inability of the field to come to a consensus on one model of disordered eating behaviors/attitudes development. Knowing that researchers conduct and clinicians practice using different theoretical orientations, one model may never emerge as predominant. This is unfortunate as prevention programs are most effective when risk variables can be identified. Nonetheless, adopting a model that includes various systems, such as Bronfenbrenner's Ecological Systems Theory (Broderick & Blewitt, 2010), would allow for a wide variety of previously proven significant variables in explaining the development of disordered eating behaviors/attitudes. The Ecological Systems Theory accounts for the many institutions that influence and impact the psychology of an individual. Perhaps the addition of a genetic or biological component to this theory would provide better causal models that could lend themselves to statistical testing; thus, resulting in refined prevention efforts.

As mentioned previously, the field must consider its gender bias, both in research and in practice, and begin to include, study and treat men with disordered eating behaviors/attitudes as much as it does women. The same is also true for ethnic minorities, and the LGBTQQ population.

In conclusion, it is suggested that prevention programs stay current and incorporate new, scientifically proven, successful interventions into their curriculum. Specifically, mindfulness-based approaches have been shown to have strong and successful links to the reduction of body dissatisfaction, emotional eating, and dichotomous thinking (Alberts, Thewissen, & Raes 2012). Borrowing from positive psychology, mindfulness emphasizes self-compassion and non-judgment in order to cultivate self-acceptance (Kristeller & Hallet, 1999). These methods could be useful in the prevention of disordered eating behaviors/attitudes as the sociocultural, feminist, and cognitive-behavioral models explaining disordered eating behaviors/attitudes development each contain a component of perfectionism or negative self-evaluation. If a young man or woman can learn how to develop self-compassion and self-acceptance, their self-esteem may rise and they may learn to question external ideals of beauty. Future research should seek to examine the utility of implementing mindfulness-based techniques in eating disorder prevention programs.

Cross-sectional research on eating disorder development has given the field an acceptable place to start in creating explanatory models. The hope is that, with a better understanding of the predictors or risk factors of disordered eating behaviors/attitudes, prevention programs will be constructed to address each of the variables explaining eating disorder development. The reality, however, is that multiple variables influenced by many different institutions, and their interactions, can lead to disordered eating behaviors/attitudes. Recently, explanatory models have become muddled with the substantial evidence that genetics and biology play a role in whether or not an individual develops an eating disorder (Strober, Peris, & Steiger, 2014). Since our

current understanding of how to alter genetics remains very limited, the question must

be asked, is it possible to develop a program to actually prevent disordered eating

behaviors/attitudes from happening? Therefore, it is proposed that future longitudinal

designs be created that integrate theory from positive psychology, specifically the

literature around resiliency, to answer the questions of what *protective* factors can be

taught rather than what risk factors can be prevented. Nonetheless, future study designs

should focus on identifying variables that protect against disordered eating

behaviors/attitudes rather than what might place one individual more at risk.

Limitations of the present study include its inability to test the dual pathway

portion of the Socioculturally Based Dual-Pathway Model. Bradford and Petrie (2008)

tested the cyclical nature of negative affect and disordered eating attitudes by using a

longitudinal design. The current study is cross sectional and as such was not able to

draw causal conclusions or conclusions regarding the cyclical relationship of these two

constructs. In addition, results were collected using self-report measures, which may be

subject to biased responses (Cook & Campbell, 1979). Similarly, due to the secretive

nature of disordered eating behaviors/attitudes, it is possible that respondents were not

entirely honest with their answers (Bradford & Petrie, 2008). Multiple sample

modeling should be conducted in the future to evaluate this model's comparability

across subgroups. This study would have benefited from a larger sample of competitive

athletes and male participants who identified as either athlete or non-athlete. In addition,

it would be useful for future studies to involve groups of male athletes who are at risk

for competing in sports where leanness is essential such as wrestlers or jockeys as this

data might clarify some of these suggestive findings.

APPENDICES

Appendix A

Informed Consent

The University of Rhode Island, Department of Psychology

CONSENT FORM FOR RESEARCH

PROJECT TITLE: Testing Predictors of the Socioculturally Based Dual-Pathway
Model in Development of Disordered Eating in Athletes
PRINCIPAL INVESTIGATOR: Sarah E. Howes

You are being asked to participate in a research project that examines different factors that predict disordered eating in individuals. Please read the following information carefully before you decide to complete the questionnaire. If you have any questions, regarding any portion of this research, please feel free to contact the researcher, Sarah Howes, via e-mail at showes@mail.uri.edu. You must be at least 18 years old to participate in this research project

Description of the Project: The purpose of this project is to test the socioculturally based dual-pathway model by examining the prediction of disordered eating among athletes and non-athletes. It makes no difference if you are an athlete, a non-athlete, or have ever been diagnosed with an eating disorder.

If you decide to take part in this study, your participation will involve completion of the questionnaire following your approval that you are at least 18 years of age. Your entire time commitment should be about 15-25 minutes.

While **every attempt has been made to be sensitive to your experience** with body dissatisfaction and possible disordered eating, there is still a possibility that **some questions may make you uncomfortable** or upset.

Although there may be no direct benefit to you for taking part in this study, your responses provide a tremendous resource in helping to understand the predictors of disordered eating. Research in this area is scarce and your participation is crucial to the advancement of knowledge in this regard.

Your part in this study is confidential and anonymous. None of the information will identify you by name, therefore, no one will know you, personally, participated in this study and no one can find out what your answers were.

Participation in this study is not expected to be injurious or harmful to you; however, if this study causes you an injury, you should write or call Sarah Howes (see above) and/or Charles Collyer, Ph.D. at the University of Rhode Island at (401) 874-4227.

Your participation in this study is strictly voluntary and you can refuse to answer any question. If you decide to take part in this study, you may stop at any time.

Whatever you decide will have no negative consequences for you. If you choose not to participate, you can simply disregard this request.

If you have any questions or concerns about this research, you may discuss your complaints with Sarah Howes (see above) or with Charles Collyer Ph.D. (see above), anonymously, if you choose. In addition, you may contact the University of Rhode Island's office of the Vice President for Research, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

If for any reason these questions are upsetting to you and you would like to talk to someone, you may contact any of the following organizations for assistance and/or referral:

- National Eating Disorders Organization- (206) 382 3587
- URI Counseling Center- (401) 874-2288
- American Anorexia/Bulimia Association- (215) 877- 2000
- National Association of Anorexia Nervosa & Associated Disorders- (847) 831-3438
- Anorexia Bulimia Care- (617) 259-9767

If you are at least 18 years old, you have read the consent form and your questions have been answered to your satisfaction, then completion of the survey to follow implies your consent to participate in this study. Please retain this form for yourself. Your signature is not required, since this research is both anonymous and confidential.

Thank you,

Sarah E. Howes

*Approved by the University of Rhode Island Institutional Review Board on February 26th, 2009.

Appendix B

DIRECTIONS: Listed below are statements about attractiveness in our society. For each item, please check the response that best describes what you believe to be true using the following scale:

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree

It is very important that you respond to all these items and that you answer them honestly.

1. People would prefer to date thin rather than
   overweight men and women…………………………..1 2 3 4 5 6 7

2. It is not that important for overweight men
   and women to spend money on clothes since
   they will look unattractive no matter what
   they wear……………………………………………1 2 3 4 5 6 7

3. A woman or a man with an attractive face will
   not get very far in life without a thin body……………1 2 3 4 5 6 7

4. Overweight men and women lack self-control
   and discipline………………………………………1 2 3 4 5 6 7

5. The heavier a man or a woman is, the less attractive
   he or she is…………………………………………1 2 3 4 5 6 7

6. Being physically fit and in-shape is directly related to
   attractiveness………………………………………..1 2 3 4 5 6 7

7. Physically fit and in-shape men and women have a greater
   sense of well-being………………………………..1 2 3 4 5 6 7

8. Thinness represents the current beauty ideal for men
   and women…………………………………………1 2 3 4 5 6 7

9. Attractive men and women are smarter than unattractive
   men and women……………………………………1 2 3 4 5 6 7

10. The more physically fit and in-shape a man or a woman
is, the more likely it is he or she will have a romantic
partner…………………………………………………1 2 3 4 5 6 7

11. Attractive men and women are more interesting and
outgoing than unattractive men and women……………1 2 3 4 5 6 7

12. It is important for men and women to be physically fit
and in-shape……………………………………………1 2 3 4 5 6 7

13. Overweight men and women should be embarrassed
by how they look…………………………………………1 2 3 4 5 6 7

14. Attractive men and women lead more fulfilling lives
than unattractive men and women………………………1 2 3 4 5 6 7

15. The thinner a man or woman is, the more attractive
he or she is…………………………………………………1 2 3 4 5 6 7

16. Attractiveness increases the likelihood of professional
success…………………………………………………..1 2 3 4 5 6 7

17. A physically fit and in-shape body reflects the beauty
ideal for men and women………………………………1 2 3 4 5 6 7

18. Physically fit and in-shape men and women have more
self-confidence………………………………………..1 2 3 4 5 6 7

19. Men and women who are physically fit and in-shape
have more fun than those who are not…………………..1 2 3 4 5 6 7

Appendix C

Please read each of the following items and check the number from the following scale that best reflects your satisfaction with the item listed.

1	2	3	4	5	6

extremely   extremely
dissatisfied   satisfied

1).   Height
2).   Weight
3).   Hair
4).   Complexion
5).   Overall Face
6).   Shoulders
7).   Arms
8).   Stomach
9).   Breasts/Pectorals
10).   Buttocks
11).   Hips
12).   Upper thighs
13).   Lower Legs
14).   General Muscle Tone

Appendix D

Instructions: Below are some words that may describe how you felt during the last month. Read each one and check a number (from 1 to 5) to show if you felt this way.

1= Very true
2= Pretty true
3= Somewhat true
4= A little true
5= Not at all true

During the last month I felt:

1. tense	1	2	3	4	5
2. afraid	1	2	3	4	5
3. dissatisfied with things	1	2	3	4	5
4. cheerful	1	2	3	4	5
5. weak	1	2	3	4	5
6. sad	1	2	3	4	5
7. healthy	1	2	3	4	5
8. satisfied with things	1	2	3	4	5
9. enjoyed things	1	2	3	4	5
10. worried	1	2	3	4	5
11. hostile	1	2	3	4	5
12. nervous	1	2	3	4	5
13. interested in things	1	2	3	4	5
14. happy	1	2	3	4	5
15. alert	1	2	3	4	5
16. confident about things	1	2	3	4	5
17. irritated	1	2	3	4	5

18. angry	1	2	3	4	5
19. strong	1	2	3	4	5
20. depressed	1	2	3	4	5
21. upset	1	2	3	4	5
22. friendly	1	2	3	4	5
23. had a lot of energy	1	2	3	4	5
24. relaxed	1	2	3	4	5

Please read each of the following items and check the number from the following scale that best reflects your agreement with the statement.

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree

1). Even if I fail slightly at tasks, for me, it is as bad as being a complete failure.

2). I hate being less than the best at things

3). I think I expect higher performance and greater results in my daily activities than most people.

Demographic Questions

Please answer the following questions based on your current situation:

1). What is your sex?
___ Female   ____ Male

2). What is the month and year of your birth? ____ (open ended)

3). What do you consider to be your ethnicity?
___ White/Caucasian
___ Hispanic/Latino
___ Black/African-American
___ Asian/Pacific Islander
___ Native American/ Alaskan Native
___ Other (please specify)
        _____

4). Please check one of the following that best describes your level of physical
     activity:
___ I am currently participating in competitive athletics.
___ I am currently participating in recreational athletics.
___ I do not currently participate in competitive nor in recreational
      athletics.

5). If you are currently participating in a recreational or competitive sport, please state
which sport. If you are not currently participating in a sport, please proceed to the next
page. ___

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