Graduate Theses and Dissertations   Graduate School

2010

The psychometric validation of the physical body experiences questionnaire

Jessie E. Menzel
University of South Florida

Follow this and additional works at: http://scholarcommons.usf.edu/etd

 Part of the American Studies Commons

The Psychometric Validation of the Physical Body Experiences Questionnaire

by

Jessie E. Menzel

A thesis submitted in partial fulfillment
of the requirements for the degree of
Masters of Arts
Department of Psychology
College of Arts and Sciences
University of South Florida

Major Professor: J. Kevin Thompson, Ph.D.
Michael T. Brannick, Ph.D.
Jonathan Rottenberg, Ph.D.

Date of Approval:
April 12, 2010

Keywords: body image, embodiment, measurement, physical activity, disordered eating

Table of Contents

List of Tables

Figures

The Psychometric Validation of the Physical Body Experiences Questionnaire

Jessie Menzel

ABSTRACT

Embodiment is defined as a state in which one experiences one's body as an essential and loved aspect of one's lived experiences, a potential protective factor against body image and eating disturbance. While qualitative studies have been conducted to examine the nature of embodiment, a quantitative measure has not yet been created. The Physical Body Experiences Questionnaire was rationally derived as a measure of embodiment based on focus groups, literature reviews, and expert review. These qualitative methods resulted in a 32-item scale measured on a 7-point Likert scale. Based on the results of a pilot study conducted with 670 female undergraduate participants, revisions were made to the PBE to improve item wording and reduce the number of negative items in the scale.

The aims of the study were to assess the psychometric properties of the revised PBE, test the convergent and predictive validity of the questionnaire, and confirm the factor structure of the questionnaire. The PBE - along with several other measures of body image, self-objectification, and disordered eating - was administered to two independent samples randomly selected from a pool of 638 female undergraduate students at least 18 years of age.

In Sample 1, exploratory factor analyses indicated that 4 factors should be retained. The final PBE consisted of 18 items and 4 subscales (Mind/Body Connection, Body Acceptance, Physical Competence, and Physical Limits). The total scale and subscales demonstrated excellent internal consistency. Significant correlations were found between the PBE subscales and measures of body awareness, body responsiveness, body satisfaction, positive body image, self-objectification, disordered eating, and self-esteem. Regression analyses indicated the subscales differentially predicted disordered eating and positive body image. Results indicated the utility of the Mind/Body Connection and Body Acceptance subscales in predicting body awareness, body responsiveness, positive body image, body satisfaction, self-objectification, disordered eating, and positive body image.

In Sample 2, confirmatory factor analyses confirmed the factor structure of the PBE. These findings indicate that the PBE has important utility for future investigations of positive body image, physical activity, and disordered eating. Limitations of the study are discussed.

Chapter 1

Introduction

The ubiquitous practices and experiences of objectification in modern, communication-rich societies are unhealthy for females and males alike (Forbes, Collinsworth, Jobe, Braun, & Wise, 2007; Fredrickson & Roberts, 1997; Smolak & Murnen, 2007). Consequently, it is important to identify, understand, and, if possible, enhance circumstances that have the potential to help females buffer or dilute the insidious, cumulative power of objectification and the resultant "disrupted connection with the body" (Piran & Cormier, 2005, p. 549).

Self-objectification occurs when a person takes on an externally-oriented awareness of the body, focusing on how the body appears to others (e.g., "How do I look?") as opposed to an internally-oriented awareness of the body (e.g., "How do I feel?"; Daubenmier, 2005; Fredrickson & Roberts, 1997). This internally-oriented (or non-objectified) state has been hypothesized to be healthier because it places a person more in tune with the body's sensations and more appreciative of the function of the body (as opposed to the looks of the body; Daubenmier, 2005). Therefore, engaging in processes that help to foster appreciation of the function of the body may help to cultivate a mind-body connection which may more beneficial than a self-objectified state. Fredrickson and Roberts (1997) identified physical activity as an experience that may help to establish and reinforce a positive, internally oriented, flexible, and trusting

1

connection with the body. We refer to this mind-body state as *embodiment* (Piran & Cormier, 2005). The purpose of the current studies was to develop a self-report questionnaire that assesses the level of embodying experiences that may result from physical activity.

Embodiment

According to Piran and colleagues (2002), embodiment is an integrated set of memories, beliefs, feelings, and expectations that comprise a strong sense of presence in the body and are expressed through the body. Embodiment is a state and, hopefully, a trait in which one experiences one's body as an essential aspect of the often interrelated experiences of competence, interpersonal relatedness, power, self-expression, vitality, and well-being (Piran, 2001; Piran, Carter, Thompson, & Pajouhandeh, 2002; Piran & Cormier, 2005; see also Levine & Piran, 2004). The fundamental psychological elements of embodiment are: respect for and care of the body; physical freedom; instrumentality and functionality (i.e., the perceived ability to take care of one's self – including one's body – and to take action – including physical action – on one's own behalf; Parsons & Betz, 2001); empowerment; a relative lack of externally oriented self-consciousness about the body; the ability to know and voice bodily experiences and needs; and a deep mind/body connection.

Thus, an "embodied" woman lives in and relates to her body in a comfortable, respectful, trusting, and connected way. She does not "see" or "feel" or "treat" or "punish" (e.g., purge) her body as a separate, vulnerable object whose hunger, feelings, and other desires will betray her (e.g., make her "fat and ugly" and "undesirable and lonely") and whose appearance must be monitored and managed because its value to her

is measured primarily in terms of its sexualized importance to others. Rather, an embodied woman accepts and respects her body as inextricable part of her being. Her body becomes a source, a subject, and a lively expression of her lived experience. And this embodied vitality extends to her ability to *be*, depending on the circumstances, instrumental (independent and agentic) and/or expressive (Impett, Schooler, & Tolman, 2006; Piran, 2001; Piran et al., 2002; Van Wolputte, 2004).

The conceptual definition of embodiment and investigation of the phenomenon has been primarily based on qualitative research. Piran (1999; Piran et al., 2002), who has taken a feminist approach to the study of eating disorders, interviewed 11 young women from varying backgrounds and conducted focus groups with women from ballet academies. The accounts collected enumerate the ways in which these young women have negotiated their relationships with their bodies throughout adolescence and in the face of societal pressures to be thin.

The study of embodiment is particularly salient to the research on body image. As a body image construct, embodiment or embodied experience offers a more comprehensive view of the way in which women (and men) relate to their bodies. In a large part of the current body image literature, the relationship between a person and her or his body has been examined in terms of how one perceives and evaluates her or his own physical appearance (Thompson, Heinburg, Altabe, & Tantleff-Dunn, 1999). However, the relationship between self and body can be extended to include the experience of body function, bodily sensation and awareness, and physical competence (Avalos, Tylka, & Wood-Barcalow, 2005; Cash & Pruzinsky, 2002; Fredrickson & Roberts, 1998). Evaluations of appearance and other more objective features of the body

3

(like weight or physical fitness) also have consequences for how we evaluate or define our sense of self (Cash & Pruzinsky, 2002; Fredrickson & Roberts, 1998). Lastly, the role of experience is an often ignored but an important aspect of body image. Our body image is not trait-like, but ever changing depending on social context, mood, development (e.g., puberty), health, media exposure, and the comments and appraisals of others (Cash & Pruzinsky, 2002; Herbozo & Thompson, 2006; Keery, van den Berg, & Thompson, 2004; Piran et al., 2002). The concept of embodiment captures many of these different facets, emphasizing the consequences that many aspects of appearance and physicality can have on a person as she or he negotiates her or his way through life experiences.

Embodiment and Self-Objectification

As was stated previously, there has been no study to date examining embodiment and its experience in a quantitative manner, but support for the construct can be based in part on the emerging literature on *objectification theory* (Fredrickson & Roberts, 1998). Objectification theory was developed based on the observation that in many societies, a female's social significance and self-concept are defined in large part by how her body shape and appearance are evaluated as the *object* of the sexualized masculine gaze (Fredrickson & Roberts, 1997; Smolak & Murnen, 2004, 2007). Generally speaking, sociocultural processes forge an association between men's bodies and power, action and agency, and social control (*subject*-ivity). Conversely, female bodies are inscribed with the meaning of beauty, attraction and reception, passivity, and self-control (*object*-ivity). Men and women alike experience sexual objectification, and they respond to it in similar, negative ways (Hebl, King, & Lin, 2004; McKinley, 1998; Tiggemann & Kuring, 2004). However, women tend to be objectified more often and are

4

more likely to report that objectification is part of their normative, daily experience (Grabe, Hyde, & Lindberg, 2007). Examples of objectifying daily experience are viewing objectifying images of their own sex in the media, being encouraged to wear clothing that is uncomfortable and restrictive but "looks hot," and, when wearing that clothing, receiving stares, leers, and cat calls on the street.

The focus of all this looking and judging—in public, in the schools, in the media, in using media, in private, in the mirror—is the body, and specifically the sexual value of how the body is seen. Therefore, it is quite likely that the vast majority of females will learn to internalize, to a meaningful degree, the process of being seen, having "looks", and being judged. Eventually, these experiences are translated into some degree of *self*-objectification, which includes the externally-oriented monitoring and evaluation of one's own body even when no observer is present (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998). Consistently, studies indicate that, on average, adolescent girls and young women (including lesbians) only *disagree somewhat* or *neither agree or disagree* with self-surveillance statements such as "During the day, I think about how I look *many* times [italics added]" and "I *often* worry about whether the clothes I am wearing make me look good [italics added]" (Downs, James, & Cowan, 2006; Grabe et al., 2007; Kozee & Tylka, 2006; Kozee, Tylka, Augustus-Horvath, & Denchik, 2007).

Several researchers agree that embodiment can be potentially very beneficial and uplifting for women because it encompasses a non-objectified experience of the body (Daubenmeir, 2004; Parson & Betz, 2001; Piran et al., 2002). As opposed to focusing on her outward appearance and placing value on external aspects of the body (e.g., sex appeal, weight, measurements), a woman with a non-objectified experience of her body

5

would theoretically be more in tune with her bodily sensations (body awareness) and would place more value on her health and physical fitness. According to objectification theory, women who live a self-objectified existence are more out of tune with their body, experience more sexual dysfunction, and are more likely to engage in unhealthy eating behaviors (Calogero, Davis, & Thompson, 2005; Daubenmier, 2005; Fredrickson & Roberts, 1997; Steer & Tiggemann, 2008; Tylka & Hill, 2004). Furthermore, this externally oriented appearance consciousness leads to anxiety, body-focused shame, diminished mental performance, and decreased opportunities for experiencing "flow" (Fredrickson & Roberts, 1997; Fredrickson et al., 1998; Impett, Schooler, & Toman, 2006; Quinn, Kallen, Twenge, & Fredrickson, 2006; Roberts & Gettman, 2004; Smolak & Murnen, 2004, 2007).

One of the first studies to examine aspects of a mind-body relationship looked at the effects of a yoga routine of women's levels of self-objectification (Daubenmier, 2005). In this quasi-experimental study, women were recruited to participate in the study from three groups: yoga practitioners not currently taking aerobics classes, aerobic exercisers not currently taking yoga classes, and women who had not taken aerobics or yoga classes in the past 2 years. Yoga is a series of poses and stretching and balancing positions designed to cultivate a mind-body connection. This connection is achieved in theory by encouraging practitioners to attune themselves to bodily sensations and to become internally aware (as opposed to being aware of appearance). Mediation analyses looked at the relationship between self-reported self-objectification and two mind-body constructs: body awareness and body responsiveness. Body responsiveness is a measure of how body sensations (as ascertained via body awareness) are valued and treated.

Results revealed significant group differences on all three measures, with the yoga group reporting lower levels of self-objectification and higher levels of body awareness and body responsiveness compared to the aerobic and control groups. Furthermore, body responsiveness mediated the relationship between exercise group and self-objectification, meaning that responsiveness to body cues may help prevent or lower levels of self-objectification. More recently, a longitudinal study of men and women enrolled in a 2-month yoga immersion program found that participation resulted in decreased self-objectification and increased body awareness and responsiveness (Impett, Daubenmier, & Hirschman, 2006).

Embodiment and Physical Activity

Although one could theoretically have embodying experiences in a variety of contexts and activities, physical activity is a domain of particular interest. Physical activity has received attention in both the objectification and body image literature because being active offers girls and women numerous opportunities to experience their bodies in non-objectified ways (Fredrickson & Roberts, 1997; Rubin, Nemeroff, & Russo, 2004). Moreover, research from the sports psychology and objectification literature has explored and has offered empirical and qualitative support for many major components of embodiment in addition to the previously discussed concepts of awareness and bodily responsiveness. These components include physical competence and functionality, mind-body connection, and lack of an externally oriented consciousness concerning the body. After all, being physically active, for example participating and succeeding in competitive sports, requires many of these essential elements of embodiment (Fredrickson & Roberts, 1997; Jackson, Kimiecik, Ford, & Marsh, 1998).

7

Internally oriented consciousness of the body. Some of the observed benefits of athletic participation for women (e.g., greater body satisfaction; Smolak, Murnen, & Ruble, 2002) may be the result of lower levels of self-objectification and higher levels of embodiment. A major tenet of objectification theory is that females who self-objectify are very concerned with their outward *appearance* and thus will conceptualize, "see," and eventually experience their bodies in more externally-oriented, appearance-based terms. The Self-Objectification Questionnaire (SOQ; Noll & Frederickson, 1997) assesses the general tendency to define one's self more in terms of appearance-based characteristics (i.e., sex appeal, physical attractiveness, weight, and muscle tone) rather than competence-based characteristics (i.e., physical fitness level, energy and stamina, strength, and physical, and health). The competence-based items of the SOQ, though, are strongly connected to various dimensions of physical activity. Athletes, avid exercisers, and outdoor enthusiasts (for example) may devote considerable time and attention to developing and applying strength, stamina, coordination, and other physical attributes that promote an internally oriented experience of one's body in competence-based terms.

Mind-body integration. One potential link between physical activity and embodiment is also the increased opportunity for experiencing "flow", or what some athletes call "being in the zone" (Frederickson & Roberts, 1997). This time-limited but very positive, enlivening state of mind-body-task integration sometimes occurs when one is engaged in deep, unself-conscious concentration on a certain activity or task whose demands are almost perfectly matched to one's level of skill and commitment (Csikszentmihalyi, 1990). Research with athletes suggests that athletics are an ideal arena in which to experience flow due to the balance between challenge and skill, the

8

establishment of clear goals, and the receiving of unambiguous feedback (e.g., finish time, points, assists, how high one jumped or vaulted, etc.; Jackson et al., 1998). Competitive athletics offers many opportunities for experiencing "flow", both in competition and in practice and it may well be that success at the higher levels requires the capacity for frequent experiences of this positive state. Experiences of flow are not limited, though, to an athletic context. Flow has been observed to occur in such tasks as writing, playing chess, dancing, and painting (Csikzentmihalyi, 1990). Therefore, other contexts that involve physical activity, not just athletic competition, may also contain elements that are conducive to the experience of flow.

Jackson et al. (1998) found that feeling in tune with and in control of one's movements, the ability to block out irrelevant and distracting thoughts about the environment in order to focus on what one needs to do (i.e., appropriate focus), and being mentally and physically relaxed are among the many factors influencing the likelihood of experiencing flow in physical and athletic activity. Conversely, objectifying aspects of things like sporting events and exercising at the gym (e.g., spectators, mirrors, video and photography, judging, tight fitting clothing, a perfectionist emphasis on "my look" or "my looks") may negatively affect a person's level of arousal and focus of attention. However, although objectification theory would predict appearance-focused sports (e.g., gymnastics, figure skating) to be the least conducive to the experience of flow (Parsons & Betz, 2001), preliminary research suggests that athletes participating in non-appearance-focused sports are no more likely to experience flow than athletes in appearance-focused sports (Dorland, 2006; Russell, 2001). Based on this finding, it seems that flow may be a

beneficial experience related to embodiment that can be found in all contexts of physical activity, independent of objectifying conditions.

While objectification theory has supported the existence of two constituents of embodying experience, *body awareness* and *body responsiveness*, to be higher in women who regularly participate in physical activities that actively promote "mind/body" integration, no other arenas/conditions have been identified in the literature that can produce a beneficial "mind/body" experience. However, Daubenmier (2005) did find that women participating in aerobic exercise did not exhibit higher levels of body awareness and body responsiveness compared to yoga participants. As noted above, though, the experience of flow in goal-oriented, challenging contexts might better produce a type of mind-body experience which would foster increased body awareness and responsiveness. For example, situations that are more task/achievement oriented might be reaching the top of a climbing wall or achieving a personal time goal in a 5K run. An important factor in these types of activities is being physically prepared for the task or for competition. Making sure the body is physically prepared is a correlate of achieving flow (Russell, 2001). Being physically prepared is in large part a reflection of the person's ability to take care of his or her body by preventing injury (e.g., by warming up, warming down, and stretching), taking in adequate and appropriate foods for muscle recovery, and getting sufficient rest and sleep. Knowing how far to "push" the body in terms of testing its physical limits (without inducing injury or excessive pain) is also a kind of an awareness an person must have in order to reach new physical performance goals (Menzel & Levine, 2007).

Physical competence and functionality. Physical activity is also an arena which allows women to readily defy—or at the very least question—the sexual objectification, the object-like passivity, and ineffectiveness which surrounds women's bodies, clothing, and poses (Smolak & Murnen, 2004). Again research from the sports psychology literature shows that female collegiate athletes report that the benefits of their physical activity arise from the *physical* nature of athletic competition (Krane, Choi, Baird, Aimar, & Kauer, 2004). Three major themes that emerged from Krane et al.'s (2004) qualitative study of athletics, femininity, and muscularity were function, pride, and empowerment. Function related to the fact that women felt stronger and more powerful, giving them the competitive edge in their sports. The women also expressed pride in their athletic achievements because of the hard work that they put into training and competition and because of the respect they felt they had earned from others. Being "athletic" also made women feel empowered through increased self-esteem, confidence, independence, and self-respect. In keeping with the overlap between embodiment and the fundamental components of positive body image, these three themes helped female athletes to negotiate (or cope with) the fact that their bodies did not comply with hegemonic ideals of slender, "willowy" feminine beauty (Krane et al., 2004).

To reiterate, meta-analytic reviews (e.g., Smolak et al., 2000) indicate that, in general, female athletes ages 14 through 30 have a more positive body image than female non-athletes. In terms of embodiment and its links with positive body image, other studies have found that female athletes tend to have a greater appreciation for the function of their bodies and to feel empowered as the result of the unique physical experiences that athletics have to offer. Blinde, Taub, and Han (2001) described three

empowering qualities that college-age women gain from athletics: (1) a sense of body competence, (2) a belief in the self as competent, and (3) a proactive approach to life. It is also noteworthy that, for older adolescents at least, female athletes have significantly higher self-esteem than non-athletes when their sports participation is associated with a positive body image, a sense of physical competence, and development of "traditionally masculine" characteristics such as agency, assertion, and self-reliance (Richman & Shaffer, 2000). Thus, it seems that many girls and women tend to feel good about their bodies and their selves as a result of participating, and at least sometimes succeeding, in competitive sports or other demanding physical activities (Richman & Shaffer, 2000; Russell, 2004).

In general, there is evidence to support the fact that some athletes (e.g., athletes in "non-lean" sports such as softball, basketball, and rugby), and in some cases athletes in general, have more positive feelings towards their bodies and exhibit less disordered eating (Smolak, Murnen, & Ruble, 2002). Research also suggests that the same may be true for women who participate in some kinds of physical activity (e.g., yoga; Daubenmier, 2005). In general, the process of being physically active may allow individuals the opportunity to devote considerable time and attention to developing, refining, and applying skills, strength, stamina, coordination, and other physical and psychological attributes that promote an *internally* oriented experience of one's body. In terms of embodying experiences and their subsequent consolidation as embodiment, physical activity could theoretically help women in particular build body awareness, increase body attentiveness, feel an increased sense of physical empowerment, have more "flow" experiences, and develop an overall sense of physical competence (Menzel &

Levine, in press). Furthermore, work by Piran and colleagues (2002) suggest that these benefits may extend and apply to mental health consequences outside of disordered eating and body image disturbance, generalizing to the promotion of positive health behaviors, increased self-esteem, and decreased psychopathology (e.g., cutting behavior).

In conclusion, there seems to be a variety of empirical and qualitative support for embodiment, primarily from the domains of objectification theory and sports psychology. Body awareness, body responsiveness, mind-body integration (or flow), valuation of physical competence, and functionality are all components of embodiment detailed by Piran and colleagues (2002). Physical activity (either yoga or sports participation – organized or informal) seems to be an ideal arena in which to study this phenomenon as there are many aspects of being happy and successful in sport that help to foster a sense of embodiment.

Measurement of Embodiment

The first attempt to measure embodiment as it relates to participation in physical activity was the creation of the Athletic Body Experiences questionnaire (ABE; Menzel & Levine, 2007). The ABE was derived using qualitative methodology, including focus groups of female athletes, in order to rationally derive a set of questionnaire items with a high degree of content validity in relation to both the lived, embodied experiences of female athletes (Piran, 2001) and emerging theories of embodiment (Daubenmier, 2005; Piran et al., 2002). Based on the analysis of transcripts, extraction of broad themes, and the feedback from professionals and experts in the fields of objectification, sports psychology, and body image, a 32-item questionnaire was created. The items from the ABE were then modified to reflect general physical activity experiences (as opposed to

athletics only experiences) in order to be used with a broader population. The statements that comprise the PBE reflect five different themes extracted from the original focus groups: (1) awareness and responsiveness, (2) self-acceptance, (3) trust, (4) self-discovery and self-development, and (5) the body as a basis of strength and function.

The ABE was administered to a small sample 117 female athletes from small colleges and universities in the Midwest. Due to the small sample size, a factor analysis of the scale could not be conducted. However, the ABE did demonstrate promising initial estimates of reliability and validity. The scale had an internal consistency reliability of .91 and a 6-week test-retest reliability of .71. The ABE was also correlated with related variables as expected. The ABE was negatively correlated with two measures of self-objectification ($r = -.24$ and $-.39$), body dissatisfaction ($r = -.50$), body shame ($r = -.52$), interoceptive deficits ($r = -.40$), and disordered eating symptomatology ($r = -.50$). The ABE was also negatively correlated with Body Mass Index (BMI; $r = -.17$), a measure of weight for height, but after controlling for BMI, the ABE remained significantly correlated with the previous variables.

Despite the fact that the initial sample for the ABE was limited in size and unable to be analyzed using factor analytic techniques, a questionnaire measuring embodiment in athletics was developed that, at the outset, had a high degree of *content validity* with respect to theories of embodiment, to the research and clinical experience of experts, and to the "grounded" experiences of women participating in rigorous physical activity. It is feasible, though, that there are many forms of physical activity that require the same time, focus, practice, and effort as athletics but cannot be captured within the scope of a collegiate athlete sample (e.g., marathon running, triathalon, rugby, etc.). Therefore, the

ABE was revised in order to capture a broader range of physical activities. Two items in the scale were reworded to exclude the word "athletics". Additionally, a longer introduction was included that asked participants to consider their primary form of physical activity as defined by the following set of criteria: (1) you do it regularly and frequently, (2) it requires physical exertion, (3) it requires skill, (4) it requires learning and practice, and (5) it requires dedication. The inclusion of the introduction ensured that the participants completing the questionnaire were engaged in an activity that was mentally and physically on par with organized athletic participation (as opposed to recreational exercise). The revised version of the ABE is called the Physical Body Experiences questionnaire (Appendix A). The purpose of the PBE is the same: to assess embodiment as the result of engaging in physical activity.

In summary, there is currently a need in research on objectification and body image for a measure to quantitatively assess a connected, healthy, loving mind-body relationship (i.e., embodiment). The ability to assess and study embodiment will allow researchers to identify those experiences and contexts that promote and/or are associated with a more positive relationship with one's body. From the perspective of the positive psychology movement, the study of embodiment is important because it could potentially be an experience that is protective against body dissatisfaction and disordered eating behaviors, two serious and potential consequences of living in a society that teaches women to objectify themselves. The goal of pilot study described next was to analyze the psychometric properties of the PBE, the adapted form of the original ABE. Studies 1 and 2 addressed needed revisions to the PBE identified in the pilot study and analyzed the factorial structure of scale.

Chapter 2

Pilot Study

The purpose of the pilot study was to analyze the psychometric properties of the PBE, the revised version of the original ABE questionnaire.

Method

Participants

Data for this study consisted of a subset of participants from a larger, ongoing study conducted with female college students from a large Southern university. A total of 670 females were included in the current study. The majority of women in the sample were in their first year of college (30.0%) and the average age was 21.08 years ($SD =$ 4.59, range from 18 to 55). Fifty nine percent of the sample self-identified as being Caucasian, 14.2% as Black or African American, 14.1% as Hispanic or Latina, 2.7% as Asian or Asian American, 2.3% as of other ethnic origin, and 7.8% as mixed or biracial. Of the women in sample, 326 (48.9%) had participated in a varsity sport in high school and 41 (6.2%) had participated in or were currently participating in an NCAA varsity sport. In addition, 65.4% of the sample had a current gym membership and participants exercised on average 2.94 days per week ($SD = 1.93$).

Measures

Physical Body Experiences Questionnaire (PBE). The PBE was developed for the purpose of measuring embodiment in physical activity. Participants taking the survey are

prompted to consider their primary form of physical activity while responding to 32

items. Participants rated the degree to which each item statement was true of themselves

on a 7-point Likert scale from 1 (*not at all true of me*) to 7 (*very true of me*). Higher

scores indicate greater embodiment.

Procedure

The survey was administered online as part of a larger, on-going study using

SurveyMonkey software. Participants signed on to complete the survey through their

university's psychology department participant pool. The survey took approximately 60

minutes to complete and participants received course credit for their participation.

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

Descriptive Statistics

The data were examined first to ensure that scores for the measure were normally

distributed and that there was not significant skewness or kurtosis. A visual examination

of the distributions of the PBE scores indicated no significant deviations from normality.

The scale mean was 4.57 (SD = .80). Missing data was handled using listwise deletion. A

total of 670 cases were valid and used for analyses.

Initial Analysis of Internal Consistency Reliability

To determine the initial internal consistency of the PBE, Cronbach's alpha was

calculated and the item-total correlations were examined. Initial Cronbach's alpha for the

32-item scale was .89, indicating acceptable internal consistency reliability. However,

because Cronbach's alpha is sensitive to the number of items in the scale, the item-total

correlations were also examined. The average inter-item correlation was .20 (ranging

from -.40 to .83). Due to the fact that there were negative inter-item correlations, any

item with an item-total correlation of .10 or less was dropped from the scale. This criterion eliminated items 23 and 28. The internal consistency reliability analysis was then re-conducted with 30-items. Cronbach's alpha for the scale was raised to .90 and the mean inter-item correlation was .23 (ranging from -.3 to .84). All item statistics are reported in Table 1.

Exploratory Factor Analysis

An exploratory factor analysis was conducted to examine the internal structure of the 30-item version of the PBE. A common factor analysis with principal axis factoring and Promax rotation was used. The number of factors was determined by selecting eigenvalues greater than 1.0 and by looking for significant changes in the slope of the scree plot. The pattern matrix was used to examine factor loadings and criteria for factor loadings included factors greater than or equal to .45 on one factor and less than or equal to .30 on any other factor.

Five factors emerged from the analysis with eigenvalues greater than 1.0. However, upon examining the scree plot, it was evident that a 2 factor solution would be the best fit to the data. Therefore, two factors with eigenvalues of 9.58 and 5.50 were extracted and together they accounted for 50.27% of the variance in the scores. Table 2 contains the items and their pattern matrix factor loadings. It is evident from looking at the 2 factors that all of the positively worded items loaded clearly onto the first factor, while all of the reverse coded (negatively worded) items loaded clearly onto the second factor.

Table 1

Pilot study PBE item statistics.

	Inter-Total *r*	*M*	*SD*
PBE1	.62	4.76	1.68
PBE2 (reverse)	.37	4.76	1.77
PBE3	.47	4.21	1.66
PBE4	.58	4.60	1.87
PBE5	.59	4.97	1.63
PBE6 (reverse)	.20	4.91	1.67
PBE7	.63	4.83	1.58
PBE8	.43	4.04	1.70
PBE9 (reverse)	.16	5.07	1.72
PBE10	.58	3.97	1.69
PBE11 (reverse)	.33	5.08	1.81
PBE12	.54	4.03	1.70
PBE13	.62	4.12	1.73
PBE14 (reverse)	.36	5.38	1.56
PBE15 (reverse)	.23	5.00	1.61
PBE16	.50	4.73	1.71
PBE17 (reverse)	.33	5.26	1.61
PBE18	.68	4.97	1.63
PBE19	.69	4.95	1.55
PBE20	.72	4.74	1.59
PBE21 (reverse)	.23	5.08	1.62
PBE22	.56	4.58	1.75
PBE23 (reverse)	.04	4.50	1.73
PBE24	.38	3.61	1.78
PBE25	.50	3.92	1.75
PBE26 (reverse)	.31	5.19	1.49
PBE27	.59	4.61	1.74
PBE28 (reverse)	.04	3.83	1.72
PBE29 (reverse)	.19	4.66	1.60
PBE30	.16	3.44	1.67
PBE31 (reverse)	.40	5.03	1.75
PBE32	.56	4.24	1.75

Table 2

Pilot study PBE items and pattern matrix loadings obtained from exploratory factor analysis with promax rotation.

Item	Factor 1	Factor 2
1. I feel that my body is a source of strength, endurance, and energy.	**.72**	.09
3. I feel I am capable of special physical accomplishments.	**.68**	-.11
4. I have experienced being "in the zone" in which my body, mind, focus, and performance are perfectly in tune.	**.69**	-.01
5. I am aware of and respect my body's physical limits.	**.64**	.18
7. I can trust my body to learn new physical skills.	**.75**	.07
8. I feel that my body helps me challenge or ignore stereotypes about what a woman should look like.	**.62**	-.17
10. I have a deep connection with my body, one that makes me feel powerful and effective.	**.72**	-.08
12. I have put in a lot of work to make my body healthy and strong.	**.69**	-.05
13. I have discovered things about my body that help me feel a connection between my body, my mind, and myself.	**.76**	-.09
16. I listen to what my body needs in terms of food, rest, and recovery.	**.55**	.09
18. I feel that if I take care of and trust my body, it will come through for me when I need it to.	**.75**	.20
19. I have a good sense of what my body can do and be for me, even with its imperfections.	**.78**	.20
20. I can count on my body to be prepared when it comes to meeting life's challenges.	**.79**	.21
22. I feel a "rush" or "click" of excitement from mastering new physical skills.	**.68**	-.02
24. I focus more on my strength, stamina, preparation, and skill than on how I look or what size clothing I wear.	**.55**	-.19
25. I feel that my body helps me challenge or ignore traditional stereotypes about what a woman can and should do.	**.63**	-.16

Note. * = reverse coded item.

20

Table 2 (Continued).

Item	Factor 1	Factor 2
27. I get a sense of accomplishment from my physical achievements.	**.70**	.00
32. I feel a connection between my physical energy level and the clarity of my thoughts.	**.71**	-.05
2. I do not feel proud of my body.*	.11	**.48**
6. I feel that my body is unable to meet new challenges in ways that give me a clear sense of accomplishment.*	-.08	**.64**
11. I have not learned the importance of taking good care of my body.*	.06	**.57**
14. I do not trust that my mind and body will work together to create new levels of performance.*	.03	**.76**
15. I feel that the demanding physical activity leaves me feeling drained and weary outside of athletics.*	-.10	**.60**
17. I do not enjoy using my body to explore new skills.*	.05	**.55**
21. I am not able to voice what things feel right and wrong for me and my body.*	-.08	**.66**
26. I find it difficult to respond effectively to my body's needs.*	-.03	**.75**
31. I do not feel good inside of my body.*	.07	**.68**

Note. * = reverse coded item.

Testing for Method Effects

Method effects are inadequacies in measurement instruments in assessing a construct that have the potential to affect construct validity (Fiske, 1987). The differential functioning of positively and negative worded items is an instrument effect that has systematic effects on how test takers respond to an item. This phenomenon, where positive and negative items load onto two distinct factors, has been well documented in the psychological assessment literature with measures such as the Rosenberg Self Esteem

21

scale (e.g., Marsh, 1996). The main concern of the presence of a method effect associated with positively and negatively worded items, is that it may obscure the true underlying factor validity of the construct (DiStefano & Motl, 2006). Furthermore, method effects have consequences for the accuracy of the data collected and subsequently pose problems in interpreting the data associated with the instrument.

There are several methods used to determine the substantive or insubstantive meaningfulness of effects observed as the result of including negatively worded items in the scale. As suggested by Marsh (1996), a series of confirmatory factor analyses were conducted to determine the nature of the effect of positively and negatively worded items. Method effects were either represented as correlated uniqueness among items (substantively irrelevant variance) or as separate latent factors (substantively meaningful variance, e.g., trait-like response style; DiStefano & Motl, 2006). The baseline model (Model 1; Figure 1) is the unidimensional construct. The second model (Figure 2) tests the positively and negatively worded items as stemming from two different underlying constructs (e.g., positive embodiment and negative embodiment). The third and fourth models posited represent the construct (embodiment as measured by the PBE) as a unidimensional construct with correlated uniqueness among the positively worded items (Figure 3) and negatively worded items (Figure 4) to represent method effects of item wording. Lastly, two models posited embodiment as a unidimensional construct with the method effect represented as a distinct latent factor for the negatively worded items (Figure 5) and the positively worded items (Figure 6). All models were tested using SPSS AMOS graphic software.

Figure 1. *Unidimensional construct (Model 1).*
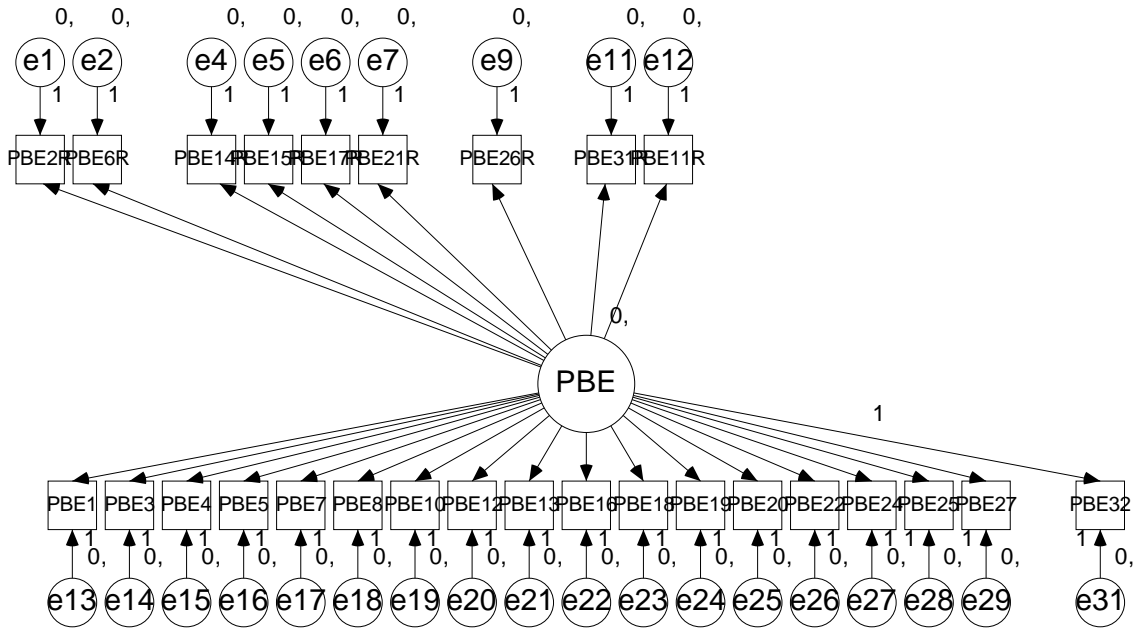
Figure 2. *Two-factor construct (Model 2).*
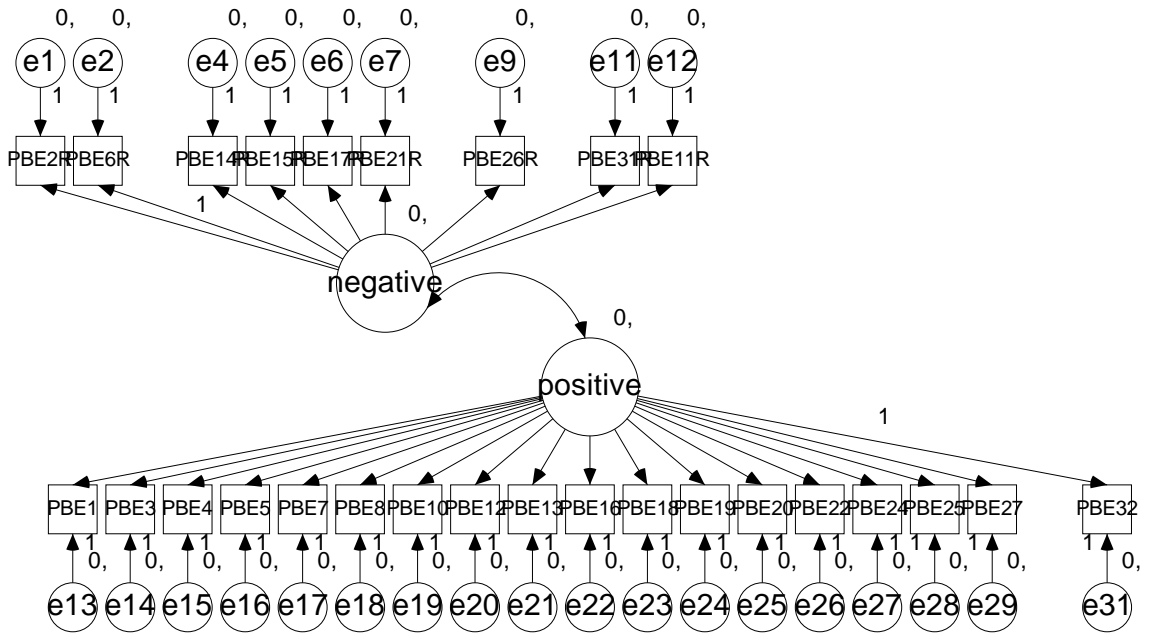
Figure 3. *Unidimensional construct with correlated uniqueness for positive items*

(Model 3).
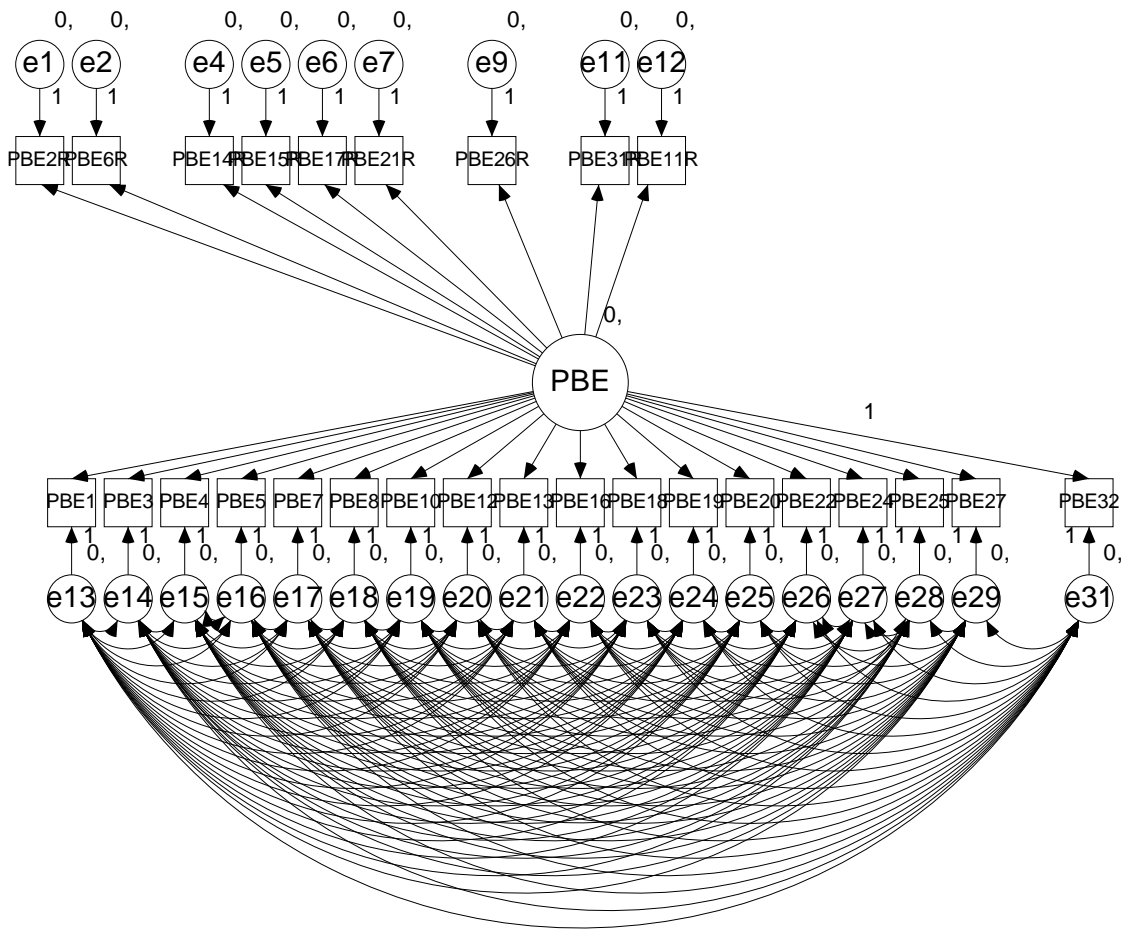
Figure 4. *Unidimensional construct with correlated uniqueness for negative items*

(Model 4).
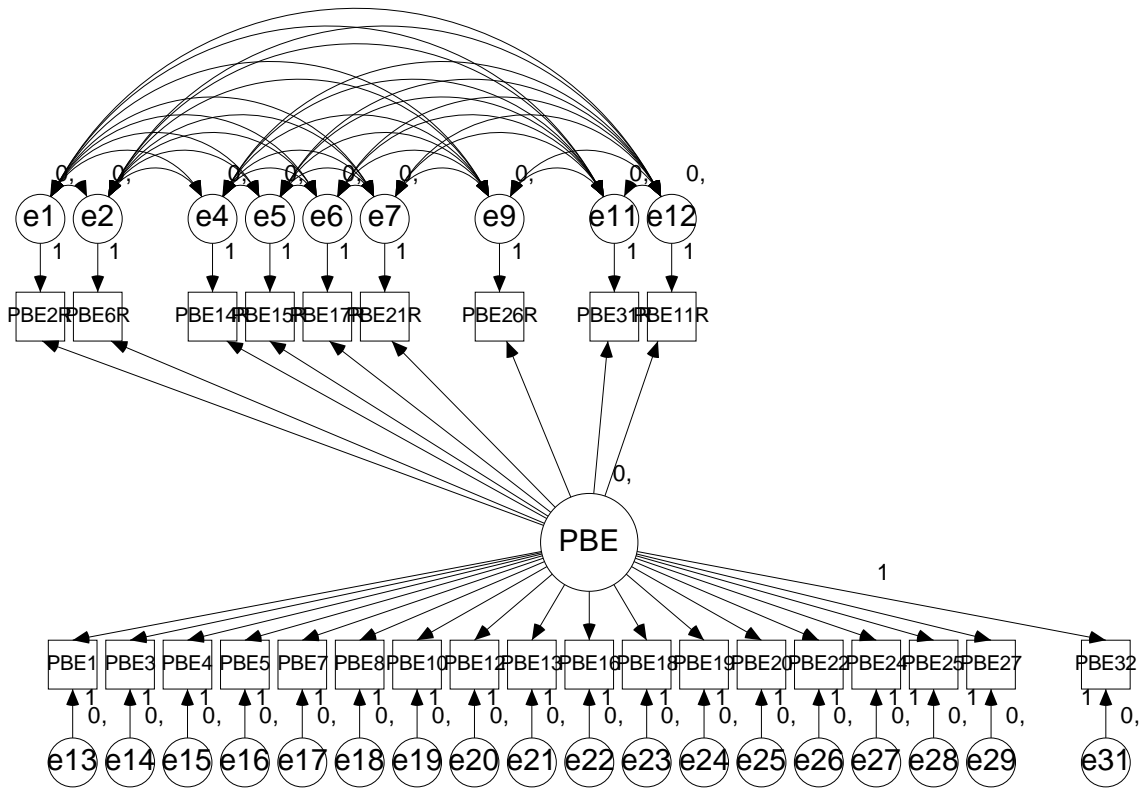
Figure 5. *Unidimensional construct with latent factor representing negative method effects (Model 5).*
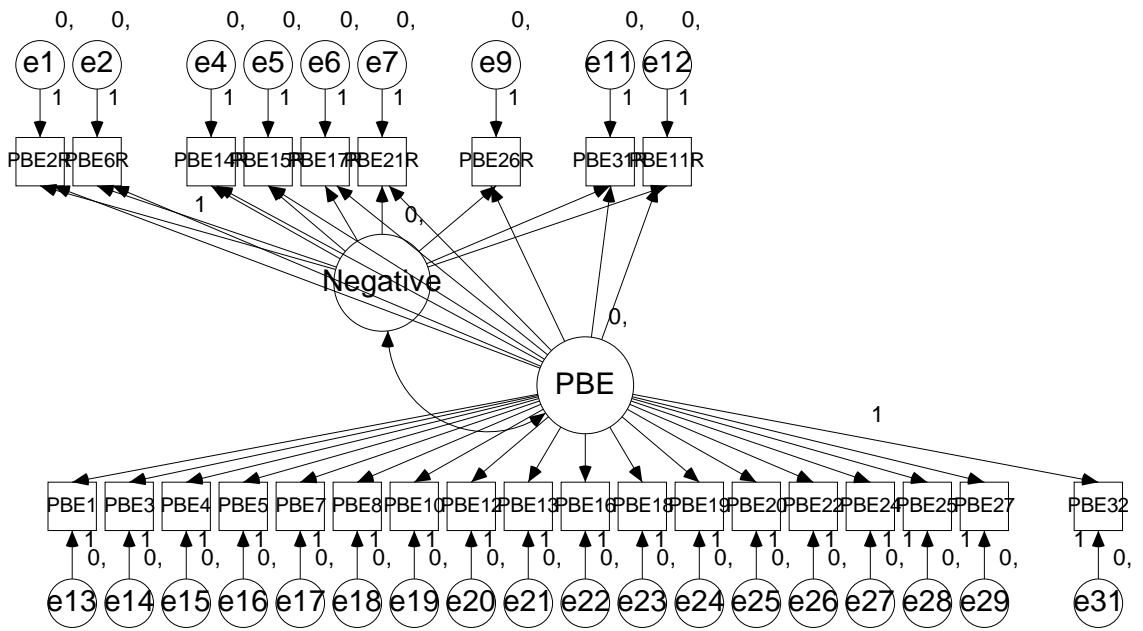
Figure 6. *Unidimensional construct with latent factor representing positive method effects (Model 6).*
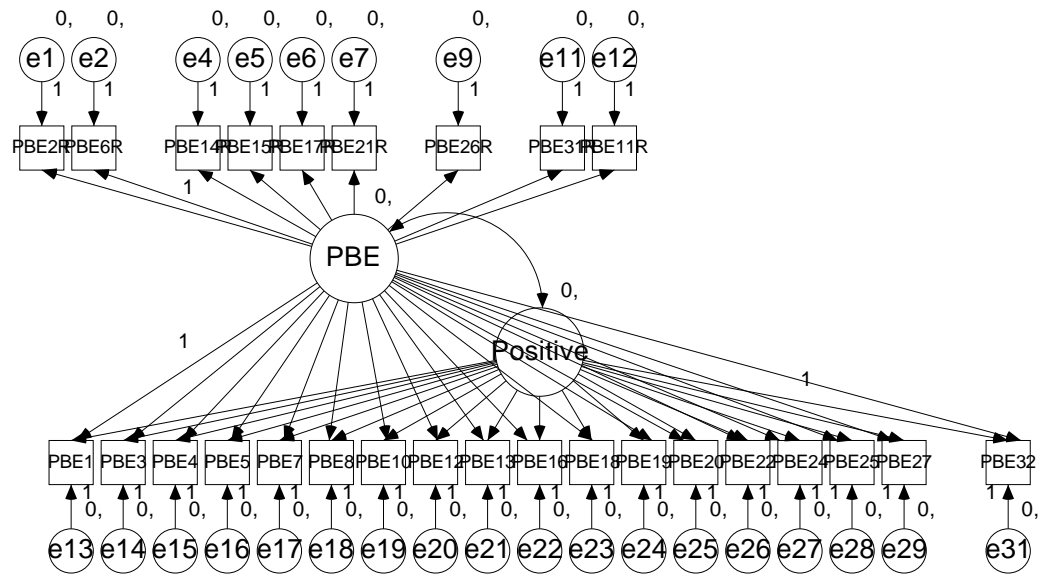
Results of CFA model testing using maximum likelihood estimation are displayed in Table 3. Model 1 did not provide a good fit to the data ($\chi2 = 3288.87$, $df = 324$) and the CFI was .56 with an RMSEA of .11. The factor model of positive and negative worded items provided a significant improvement in the fit of the data. Chi-square for Model 2 was reduced to 2001.82 with 323 degrees of freedom. The CFI and RSMEA were also significantly improved to .76 and .08 respectively. Despite the improvement in model fit, the CFI is still not high enough to confirm that a two factor model with separate underlying construct for the negatively and positively worded items is the best fit to the data.

Table 3

Pilot study confirmatory factor analysis results testing for method effects.

Model	$\chi2$	df	CFI	RMSEA
1	3288.87	324	.58	.11
2	2001.82	323	.76	.08
4	1825.90	288	.78	.08
5	1968.01	315	.76	.08
6	1778.60	306	.79	.08

Note. Model 3 was judged to be over parameterized and is therefore not presented.

The next step was to test two unidimensional models with correlated uniqueness for the positive and negatively worded items. Model 4 had correlated uniqueness for the negative items and showed a marginal improvement to the data, although not a significant reduction in the chi-square value ($\chi2 = 1825.90$, $df = 288$). The CFI improved for this model to .78 and the RMSEA remained at .08. Model 3, correlated uniqueness for

29

positive items, showed a large improvement in chi-square value ($\chi2 = 610.88$, $df = 172$), CFI (.94), and RMSEA (.06). However, Model 3 is mostly likely highly over parameterized and therefore does not seem like an acceptable model for the data.

The last two models tested represented method effects as distinct latent factors for negatively worded items and positively worded items separately. Model 5, method effect for negatively worded items, showed an improvement in model fit compared to Model 2 ($\chi2 = 1968.01$, $df = 323$). The CFI and RMSEA remained the same as Model 2 as well, at .76 and .08 respectively. The last model, Model 6, method effect for positively worded items, showed a drop in chi-square value ($\chi2 = 1778.64$, $df = 306$), CFI (.79), and RMSEA (.08). This improvement in model fit is indicative of a distinct latent construct representing a positive method. It was concluded that Model 6, representing a substantively meaningful method effect for positively worded items was deemed to be the best fit for the data. Unfortunately, the CFI and RMSEA indicate only moderately acceptable fit for the model at best.

Brief Discussion

The presence of method effects (either positive or negative) presents a problem in determining the construct validity of the scale and has been well researched with a variety of instruments (e.g., Marsh, 1996; DiStefano & Motl, 2006). While items worded in different directions are typically included in questionnaires to offset response bias, they often present problems in interpreting the factor structure of measurement instruments (Marsh, 1996). The presence of positive method effects in the current sample is unusual, though, as method effects typically tend to result from negatively worded items (DiStefano & Motl, 2006). The data from this sample indicate that some other factor is

responsible for the positive method effects, such as a personality trait or response style. Other potential explanations for method effects can be the education level of the sample, race, or gender.

In the current sample it is possible that fatigue is responsible for the method effects detected. The data from this sample were taken from a very large survey study that took approximately 50-60 minutes to complete. The particular questionnaire used here appeared in the last third of the questionnaires. It is therefore possible that participants were no longer paying enough attention to questions to answer them accurately and honestly. The method effects seen here may then represent a positive response bias caused by participants desire to rush through or finish the survey as quickly as possible.

However, the lack of model fit from the confirmatory factor analyses reveals that method effects may not be solely responsible for explaining the poor statistical functioning of the scale. Another explanation could be poor item wording. To begin, the scale was developed based in part on the responses of female athletes but was modified based on item content to be applicable to other kinds of physical activity. It is possible that some items were still more applicable to or more easily interpreted by athletes as opposed to non-athletes (e.g., being "in the zone", trusting that the mind and body will work together to create new levels of performance). In addition, several of the items were long and complex and contained vague terms and concepts (e.g., mind-body connection, trust, exploring new skills). In conclusion, the results of this pilot study revealed the need to word the majority of the items in the PBE in the same direction and to reevaluate item wording in order to better operationalize the construct of embodiment.

Chapter 3

Evaluating the Factor Structure and Construct Validity of the Physical Body Experiences Questionnaire

The purpose of this study was to gather data to test the psychometric properties of a revised version of the PBE. Based on the results from the pilot study, several important changes were made to the PBE: (1) several longer, more complicated items were shortened and expanded into smaller, shorter items, (2) the number of negatively worded items was reduced to 3, (3) vague or ambiguous wording in some items was changed. Furthermore, this study will used a smaller number of scales in administration in order to reduce potential fatigue effects. As the scale was originally developed through the use of female focus groups and since body image disturbance commonly occurs in women during their college years, the measures were only administered to females above the age of 18.

Hypotheses

Additionally, as part of construct validation using a nomological network approach, it is hypothesized that:

1. The PBE will be positively correlated with constructually related variables: body responsiveness, body appreciation (positive body image), and body awareness.

2. The PBE will be negatively correlated with self objectification and its associated negative consequences: body shame, body dissatisfaction, and disordered eating.

An additional aim of Study 2 was to evaluate the predictive validity of the PBE by testing its ability to predict the following outcome variables above and beyond current measures of body image disturbance: self-objectification, embodiment-related variables (i.e., body awareness, body responsiveness, and body appreciation), disordered eating, and self-esteem.

The final aim of Study 2 was to confirm the final factor structure of the PBE in a second sample of undergraduate women.

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

Participants

Participants for the study consisted of two independent samples randomly selected from a pool of 638 female undergraduates from the University of South Florida. Sample 1 consisted of 400 participants that completed the set of measures described below. Participants ranged in age from 18 to 59 years, with a mean age of 21.09 ($SD = 5.24$). Of the participants, 65% self-identified as being White, 18.3% Hispanic, 13.8% Black or African American, 6% Asian or Asian American, 1% Pacific Islander, and 1% Indian. Participants exercised an average of 2.67 days a week ($SD = 2.00$) and the average BMI for the sample was 23.81 (SD = 4.99), which is in the normal weight range.

Sample 2, the confirmatory sample, consisted of 206 undergraduate females. Participants ranged in age from 18 to 59 years, with a mean age of 21.04 ($SD = 5.05$). One participant was excluded because she was under the study minimum age of 18,

making the total number of eligible participants 205. Of the participants, 76.2% self-identified as being White, 13.2% Hispanic, 5.8% Black or African American, 5.3% Asian or Asian American, 1.9% Pacific Islander, and 1.5% Indian. Participants exercised an average of 2.39 days a week ($SD = 1.78$) and the average BMI for the sample was 23.29 ($SD = 4.57$), which is in the normal weight range.

Measures

Demographic Information. Participants completed a series of demographic questionnaires to determine their age, weight, height, ethnicity, sexual orientation, current exercise habits, and past and present athletic participation (see Appendix A).

Physical Body Experiences Questionnaire (PBE). Participants were administered the revised version of the PBE. This version is a 36-item scale assessing embodiment related to participation in physical activity (see Appendix B). At the beginning of the questionnaire, participants were prompted to consider that many people are physically in some way. Participants were then asked to indicate to what extent each statement is true of them and their experiences being physically active on a scale from 1 (*not at all true about me*) to 7 (*very true about me*). Items 4, 27, and 32 are reverse coded. Total scores are obtained by summing participants' responses and taking the average. Higher scores indicate greater embodiment related to physical activity.

Body Appreciation. The Body Appreciation Scale (BAS) created by Avalos and colleagues (2005) is a 13-item questionnaire measure of positive body image. The BAS consists of statements that measure the extent to which a person (a) likes his/her body, (b) accepts his/her body despite imperfections, (c) respects his/her body, and (d) protects his/her body image from unrealistic ideals. Participants are asked to rate on a scale from 1

(never) to 5 (always) how often each statement applies to them. Previous studies have demonstrated the validity and reliability of the BAS (e.g., Avalos et al., 2005; Swami, 2009). Internal consistency for the current sample was .95. To obtain scale scores, participants' responses are summed with higher scores indicating a more positive body image.

Body surveillance. The Body Surveillance subscale of the Objectified Body Consciousness Scale (S-OBC; McKinley & Hyde, 1996; Appendix C) is a reliable and valid measure of the degree to which women are concerned with and monitor how their bodies *appear to others* rather than how their bodies feel (see, e.g., Tylka & Hill, 2004). Participants indicate on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) the extent to which they agree with each of 8 statements (e.g., "I often worry about whether the clothes I am wearing make me look good"). Given that *does not apply* is also a response option for each statement, the participant's score on the S-OBC is the item mean for the scale. Higher scores indicate more body surveillance. Acceptable internal reliabilities have been reported in previous research (McKinley & Hyde, 1996; Tylka & Hill, 2004). Cronbach's alpha for the current sample was .78.

Body shame. This subscale of the Objectified Body Consciousness Scale (BS-OBC; McKinley & Hyde, 1996; Appendix C) assesses the level of shame evoked by a woman's belief that she has failed to meet culturally accepted ideals of beauty. For each of 8 statements (e.g., "When I can't control my weight, I feel like something must be wrong with me") participants choose *does not apply* or rate on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) the extent to which they agree. The BS-OBC is scored in same manner as the S-OBC, so higher item mean scores indicate higher levels of body

shame. Previous studies have supported this subscale's reliability and validity (Greenleaf, 2005; McKinley & Hyde, 1996). Internal reliability for the scale in the present sample was acceptable ($\alpha = .77$).

Body Satisfaction. The Appearance Evaluation (AE) subscale of the Multidimensional Body-Self Relations Questionnaire (MBSRQ) was used to asses body satisfaction (Brown, Cash, & Mikulka, 1990; Appendix D). The AE scale consists of 7 items assessing the extent to which ones likes her body (e.g., "I like the way I look without my clothes"). Each item is rated on a scale from 1 (*definitely disagree*) to 5 (*definitely agree*). Items 6 and 7 are reverse scored. The AE scale has been demonstrated to be a reliable and valid measure in both clinical and community populations and Cronbach's alpha for the present sample was .93. Scores for the scale are obtained by summing participants' responses. Higher scores indicate greater body satisfaction.

Body Awareness. The Body Awareness Scale was used to measure attentiveness to normal, internal bodily processes and sensations (e.g., bodily reactions, sleep-wake cycle, onset of illness; Shields, Mallory, & Simon, 1989; Appendix E). The scale consists of 18-items rated on a 7-point Likert scale from 1 (*not at all true about me*) to 7 (*very true about me*). Scores for the BAQ have been shown to be internally consistent ($\alpha = .89$) in a sample of female yoga and aerobic exercise participants (Daubenmier, 2005). In the present sample, internal consistency for the scale was very good ($\alpha = .85$). Higher scores for the scale indicate greater awareness of bodily sensations.

Body Responsiveness. A 7-item measure was used to assess responsiveness to bodily sensations (Daubenmier, 2005; Appendix F). Items include statements such as "I suppress my bodily feelings and sensations" (reverse coded). Participants respond to

items on a 7-point Likert scale ranging from 1(*not at all true of me*) to 7 (*very true of me*). Daubenmier (2005) previously reported internal reliability of scores to .85 in a sample of yoga and aerobics participants. The internal reliability for the present sample was marginally acceptable (α = .69). Higher scores indicate greater body responsiveness.

Disordered eating symptomatology. The Eating Disorders Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 2008; Appendix G) is the self-report version of a diagnostic structured interview called the Eating Disorders Examination (EDE; Fairburn , Cooper, & O'Connor, 2008). This 28-item questionnaire is a mixture of statements rated on a Likert-scale and fill-in-the-blank questions. There is solid evidence that the convergent validity of previous versions of the EDE-Q is comparable to that of the well-established EDE (Mond, Hay, Rodgers, & Owen, 2006).

The EDE-Q contains four subscales: Restraint (*n* = 5 items), Eating Concern (*n* = 5), Shape Concern (*n* = 8), and Weight Concern (*n* = 5). These subscale scores are calculated using only the Likert-scale items; information from the fill-in-the-blank items is not included. Given that the subscale scores are often highly correlated, Fairburn and Beglin's (2008) propose procedures for obtaining a global score by averaging the mean of the 4 subscale scores. All subscales have demonstrated a high degree of internal consistency in community samples, with Cronbach's alpha values between .70 (restraint) and .90 (global; Peterson et al., 2007). For the current sample, internal consistency for the four subscales and the global score were as follows: restraint .86, weight concern .85, shape concern .92, eating concern .81, and global .95. Norms for the scale have been established in a sample of young adult women, aged 18-42 (Mond et al., 2006). Higher mean item scores indicate a greater level of eating or body image disturbance.

37

Self-esteem. The Rosenberg Self-Esteem Scale (RSE) was used to measure self-esteem or general feelings of self worth (Rosenberg, 1965). The RSE is a 10-item self-report measure scored on a 4-point Likert scale (e.g., "I feel that I have a number of good qualities"). Negatively worded items are reverse coded and then item scores are summed to obtain the scale total; higher scores indicate higher self-esteem. The RSE is a widely used measure of self esteem and Cronbach's alpha for the present study was .91.

Social desirability. The Marlow Crown Social Desirability Scale (MCSD) is a 33-item measure of a participant's tendency to respond to items in a socially desirable manner (Crowne & Marlowe, 1960). The items consist of a series of true/false statements that reflect socially desirable, but uncommon behaviors (e.g., "No matter who I'm talking to, I'm always a good listener) or socially unapproved, but common behaviors (e.g., "I can remember 'playing sick' to get out of something"). After reverse coding negative items, the number of true responses was summed to derive the scale total. Higher scores indicate more social desirability bias in responding. Internal consistency for this scale in the present sample was acceptable ($\alpha = .77$).

Body Mass Index (BMI). BMI is a measure of weight for height using feet, inches, pounds, meters, or kilograms. BMI is frequently used as a measure of body fat and the following formula was used to calculate BMI for the current study: weight (pounds) divided by squared height (inches) multiplied by 703. Height and weight were obtained by self-report from the EDE-Q. BMI values are grouped into categories for interpretation (e.g., underweight, normal weight, overweight), with higher BMI values indicating higher levels of body mass.

Procedure

All questionnaires were administered electronically, online using Survey Monkey software. Undergraduate women were recruited using the Psychology department participant pool at the University of South Florida to participant in a survey on physical activity. Participants completed the survey online at times of their own choosing. Before beginning the survey, participants were asked to read an informed consent document and give their consent by clicking a button at the bottom of the page. Upon completion of the survey, participants were debriefed electronically.

Data Analyses

The mean and standard deviation of the PBE and all study measures were computed first for both samples. In addition, internal consistency (Cronbach's alpha) was computed for the PBE.

In the first independent sample (Sample 1) a common factor analysis using principal axis factoring and Promax oblique rotation method was conducted to determine the factor structure of the PBE. The factors are predicted to represent the dimensions of (1) awareness and responsiveness, (2) appreciation of strength and function, (3) self-acceptance, (4) trust, and (5) self-discovery. SPSS 17.0 statistical software was used to initially estimate the factor structure and rotation of factors. Eigen-values greater than 1.0, the scree plot, and theory were used to determine the factor solution that best fit the data. A priori item selection criteria included an examination of cross factor loadings and item means. Items were selected based on factor loadings greater than or equal to .45 on one factor and less than or equal to .30 on any other factor. Items that loaded too highly onto a second factor were eliminated. Items with item means below 1.5 were also

39

eliminated. Additionally, items that had item-total correlations less than .10 were candidates for elimination. The PBE was revised based on the results of the exploratory factor analysis.

Pearson product-moment correlations among all study variables were also computed for Sample 1. The convergent validity of the PBE was assessed by examining relationships between the PBE and related constructs: body appreciation, body awareness, body responsiveness, self-objectification, body shame, body dissatisfaction, and disordered eating. Divergent validity was examined by examining the correlation between the PBE and social desirability. Due to the positive correlation between the PBE and social desirability, social desirability was partialled out of the correlations between the PBE and all other variables. A series of regression analyses was also run to evaluate the incremental validity of the PBE subscales as predictors of the following outcomes: self-objectification, body image and embodiment variables, and disordered eating and psychological well-being. Problems of multicollinearity were assessed by examining the Variance Inflation Factor, tolerance, and condition indexes. Multicollinearity was determined to not be a problem based on these diagnostic indexes. Socially desirable responding was included in regression analyses due to the significant association between the PBE and the Marlowe-Crowne Social Desirability scale.

The second independent sample (Sample 2) was used to confirm the factor structure of the PBE. A confirmatory factor analysis of the final version of the PBE was tested using SPSS AMOS Graphics software. Fit of the factor structure was determined by examining the chi square statistic, comparative fit index (CFI), the normed fit index (NFI), and the root mean square error of approximation (RMSEA). A few standard rules

40

of thumb were used to interpret the fit indexes. A CFI value equal to or greater than .95 was considered to mean good fit between the model and data (Hu & Bentler, 1999). For the RMSEA value, .05 and lower is considered to represent good fit of the data, .05 to .08 represents acceptable fit, and .08 to .10 represents marginal fit (Browne & Cudeck, 1993). Item loadings and modification indexes were also examined in order to determine model fit and adjustments to the model.

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

Exploratory Factor Analysis

A total of 378 cases from Sample 1 were analyzed in the exploratory factor analyses of the PBE. Twenty two cases were excluded because participants failed to complete the entire measure. The eigen-values and percent of variance accounted for as a result of the exploratory factor analysis can be found in Table 4. Based on the number of eigen-values greater than or equal to 1, a 6-factor solution was suggested. However, an examination of the scree plot suggested that only one factor be retained. Based on the ease of interpretation of the factors, at least 4 interpretable factors emerged that seemed to reflect the following dimensions: Factor 1 (Mind/Body Connection), Factor 2 (Body Acceptance), Factor 3 (Physical Competence), and Factor 5 (Physical Limits). These four factors differ in content from the initial 5 factors predicted for the scale. However, the four factors do seem to reflect key aspects of the definition of embodiment. Factor 4 was eliminated because it seemed that the items loaded on to one factor because of their similarity in item wording. Factor 4 included the following items: item 1 (I feel my body is a source of strength), item 2 (I feel my body is a source of endurance), and item 3 (I feel my body is a source of energy). Furthermore, these items reflected aspects of

<div align="center">41</div>

physical competence which was better accounted for by Factor 3. Factor 6 only contained one item (Item 14, "I have learned the importance of taking good care of my body") and therefore was not retained as a factor.

Table 4.

Sample 1 Eigenvalues and percentage of variance accounted for.

	Eigenvalue	Percent of Variance
1	18.494	50.511
2	1.911	4.225
3	1.474	3.165
4	1.312	2.588
5	1.148	1.728
6	1.009	1.499

In addition, items 5, 6, and 28 were eliminated because they cross loaded onto more than one factor. Item 5, "I feel I am capable of special physical accomplishments", loaded onto both factors 1 (Mind/Body Connection, .43) and 3 (Physical competence, .51). Item 6 ("I have experienced being "in the zone" in which my body, mind, focus, and performance are perfectly in tune") loaded onto Factor 1 (Mind/Body Connection, .39) and Factor 3 (Physical Competence, .46). Item 28 ("My body makes me feel empowered.") loaded onto Factor 1 (Mind/Body Connection, .42) and Factor 2 (Body Acceptance, .43). Items 12 ("I feel that demanding physical activity helps me relieve my stress"), 21 ("I feel that if I take care of my body, it will come through for me when I need it to"), and 27 ("I value my looks or what size clothing I wear more than my strength, stamina, or physical skill") were eliminated because they did not load strongly

onto any factor. Item 15 ("I have put in a lot of work to make my body healthy and strong") and item 31 ("I think more about what my body can do rather than how my body looks") originally loaded onto Factor 1 (Mind/Body Connection), but both seem to better reflect the physical competence aspect of embodiment. Therefore, the items were eliminated from the scale. Items 35 (I feel that I can trust my body to perform for me when I need it to") and 36 (I feel that I can trust my body to handle physical challenges in life") were originally hypothesized to reflect an independent factor related to trust, but instead loaded onto Factor 2 (Body Acceptance). The items were subsequently dropped because they were not consistent in item content with the primary factor.

After the initial round of item elimination, the factor analysis was conducted again. A four factor solution emerged based on eigenvalues greater than or equal to 1 (10.01, 1.44, 1.12, and 1.04). Again, the scree plot suggested a one factor solution, however based on ease of interpretability, the four factors were retained. The four factors from the second analysis were identical to those that were retained from the initial factor analysis. After this round of analysis, only item 17 ("I trust that my mind and body will work together to help me perform at my best") was dropped due to cross loading on multiple factors. Item 32 ("I feel uncomfortable pushing my body's physical limits"), a reverse scored item, loaded onto Factor 3 (Physical Competence) although it seemed better suited for Factor 4 (Physical Limits). However, because the item does seem to reflect the act of being physically active and the idea of "pushing limits" is part of the process involved in gaining new physical skills, the item was retained. In addition, retaining a second reverse scored item (i.e., item 32) adds to the strength of the scale.

43

A third and final factor analysis was conducted which confirmed the four factor structure of the previous rounds, based on eigenvalues, percentage of variance accounted for by each factor, and ease of interpretability. The four factor solution resulted in an 18-item scale and accounted for 71.57% of the scale variance. Final items and factor loadings can be found in Table 5.

Table 5

Sample 1 PBE items and factor loadings.

	Item	Factor 1	Factor 2	Factor 3	Factor 4
4.	I feel ashamed of my body. *	.03	**.62**	-.25	-.01
7.	I respect my body's physical limits.	.06	.07	-.18	**.78**
8.	I am aware of my body's physical limits.	-.09	.06	-.08	**.88**
9.	I feel that my body is able to respond to physical challenges.	.22	-.16	**.54**	.29
10.	Meeting physical challenges gives me a clear sense of accomplishment.	.22	-.41	**.93**	.09
11.	I can trust my body to learn new physical skills.	.15	.20	**.54**	.01
13.	I have a deep connection with my body, one that makes me feel powerful and effective.	**.64**	.28	.00	-.04
16.	I have developed a connection between my body, my mind, and myself.	**.57**	.30	-.04	.07
18.	I feel that demanding physical activity leaves me feeling energized and invigorated each day.	**.59**	.01	.19	-.02
20.	I enjoy using my body to explore new skills.	.25	.21	**.52**	-.20

Note. * = reverse scored item.

Table 5 (Continued).

Item	Factor 1	Factor 2	Factor 3	Factor 4
22. I have a good sense of what my body can do and be for me, even with its imperfections.	.08	**.50**	.21	.14
23. I can count on my body to be prepared when it comes to meeting life's challenges.	.12	**.55**	.24	.02
24. I feel good inside of my body.	.01	**.83**	-.02	.03
25. I am able to voice what things feel right and wrong for me and my body.	-.06	**.63**	.10	.25
26. I feel a "rush" or "click" of excitement from mastering new physical skills.	.16	.16	**.66**	-.14
32. I feel uncomfortable pushing my body's physical limits.*	-.31	-.00	**.57**	-.10
33. I notice the strength of my body throughout many of my daily activities.	**1.14**	-.07	-.34	.03
34. I feel a connection between my physical energy level and the clarity of my thoughts.	**1.01**	.02	-.23	-.05

Note. * = reverse scored item.

Item Analysis

Mind/Body Connection. The resulting Mind/Body Connection subscale (MBC) from the final EFA resulted in a 5-item scale. Cronbach's alpha for the Mind/Body Connection subscale was very good ($\alpha = .90$). Item means, standard deviations, and corrected item-total correlations can be found in Table 6. All item-total correlations were above .70. The internal consistency of the subscale (as indexed by Cronbach's α) would be lowered slightly if any one item were removed from the scale. Therefore no items were removed on this basis in order to improve the alpha for the subscale. The average

inter-item correlation for the subscale was .65 and ranged from a lower bound of .57 to an upper bound of .79. Despite the high inter-item correlations, all items were retained due to the small number of items already included in the subscale. The average item mean for the scale was 4.72 and average item variance was .04. The scale mean was 23.60 (SD = 6.80), indicating that participants on average endorsed experiencing neither a strong connection or strong disconnect between their mind and body.

Body Acceptance and Awareness. The resulting Body Acceptance and Awareness subscale (BAA) from the final EFA resulted in a 5-item scale with good internal consistency (Cronbach's α = .85). Item means, standard deviations, and corrected item-total correlations can be found in Table 6. All item-total correlations were above .30. If any one item were removed from the subscale, the internal consistency would vary slightly. The internal consistency would be improved to .89 if item 4 (a reverse scored item) were removed. The decision was made to retain this item based on the general poor performance of reverse scored items based on item wording and the desirability to have greater variability within the subscale (Marsh, 1996). Furthermore, Item 4 did not correlate negatively with any of the other subscale items and the item-total correlation was also acceptable (r =.40), offering further support for retaining the item. The average inter-item correlation for the subscale was .53 and ranged from a lower bound of .28 to an upper bound of .75. The average item mean for the scale was 5.21 and average item variance was .08. The scale mean was 26.05 (SD = 5.91), indicating that participants on average endorsed feeling somewhat accepting of their bodies.

Physical Competence. The Physical Competence subscale (PC) from the final EFA resulted in a 6-item scale. Cronbach's alpha for the Physical Competence subscale

46

was very good ($\alpha = .86$). Item means, standard deviations, and corrected item-total correlations can be found in Table 6. All item-total correlations were at or above .70 except for item 32 (a reverse scored item) which was correlated with the scale total at .24. Removal of this item would improve the internal consistency of the scale to .90. Removal of any other item from the subscale would lower the internal consistency. Item 32 had an average item mean of 4.25 and was also an item involved in the lowest inter-item correlation (.18). The average inter-item correlation for the scale was .50 and the upper bound for inter-item correlations was .71. Based on the low item-total correlation and the low inter-item correlations, it was decided to remove item 32. This item was contentious after the EFA as well because its content better matched the subscale for Physical Limits, providing further basis for its removal of the subscale. However, due to the fact that the item has the potential to possibly load with the Physical Limits subscale in the future (possibly upon rewording of the item in a positive direction), the item was retained in the total scale so that its performance may be monitored in future analyses. After removal of item 32, the internal consistency for the subscale was recalculated and improved to .90. The new average inter-item correlation was .64 and ranged from .56 at the lower bound to .71 at the upper bound. The average item mean was 5.32 and the variance was .05. The scale mean was 26.61 ($SD = 6.40$), indicating that the average participants felt somewhat physically competent.

Physical Limits. The Physical Limits subscale (PL) from the final EFA resulted in a 2-item scale. Cronbach's alpha for the Mind/Body Connection subscale was acceptable ($\alpha = .77$). Item means, standard deviations, and corrected item-total correlations can be found in Table 6. The item total correlation for both items was equal to .63. The two

items in the subscale were correlated .63. The average item mean for the scale was 5.39

and average item variance was .02. The scale mean was 10.77 ($SD = 2.57$), indicating that

participants on average endorsed experiencing somewhat of a respect and awareness of

their physical limitations.

Table 6

Sample 1 PBE item statistics.

	Item-Total r	M	SD
PBE4*	.34	4.91	1.74
PBE7	.48	5.27	1.45
PBE8	.48	5.50	1.39
PBE9	.73	5.24	1.48
PBE10	.69	5.58	1.55
PBE11	.79	5.42	1.45
PBE13	.79	4.60	1.65
PBE16	.80	4.69	1.62
PBE18	.70	5.08	1.56
PBE20	.72	4.96	1.57
PBE22	.79	5.51	1.38
PBE23	.81	5.17	1.45
PBE24	.73	4.96	1.61
PBE25	.68	5.44	1.39
PBE26	.76	5.40	1.49
PBE32*	.14	4.23	1.68
PBE33	.68	4.60	1.53
PBE34	.69	4.69	1.60

Note. * = reverse scored item.

Factor Analysis for the Final Version of the PBE

As a total scale, the PBE presents comprises 18-items with 4 subscales and 1 item (item 32) that has been retained for future item analysis. After removal of item 32, a factor analysis was performed with the remaining 17 items. The factor analysis resulted in a 3 factor solution with eigenvalues of 10.00, 1.38, and 1.05. The three factors extracted accounted for 69.05% of the variance in the total scale. Examination of the scree plot again suggested the presence of a single, strong primary factor. Examination of the pattern matrix for item factor loadings revealed two factors which were consistent with the 4 factor analysis: Factor 1 (Physical Competence) and Factor 3 (Physical Limits). The second factor, however, was a combination of the Mind/Body Connection items and Body Acceptance items from the 4 factor solution. Furthermore, most of the Mind/Body Connection items cross loaded onto the Physical Competence factor (items 13, 16, 33, and 34; see Appendix B for item content). In addition, items 22 and 23 from the Body Acceptance scale cross loaded onto the Physical Competence factor as well. The cross loadings made all items candidates for elimination from the scale based on the 3 factor structure.

Research in measurement suggests that the performance of negative items in self report instruments may be an artifact of item wording and not item content, as was concluded in the pilot study for positively worded items (e.g., Marsh, 1996). Due to the fact that the 4 factor solution for the PBE is easier to interpret in terms of factors and retains a greater number of items allowing the scale to tap into a greater number of areas of content, it was concluded that item 32 should be retained in order to preserve the more meaningful 4 factor structure of the PBE. In other words, a decision was made to not

compromise the factor structure of the PBE based on the possible effects of wording of a single item. Therefore, item 32 will continue to be retained as part of the PBE for future analysis pending the rewording of the item. However, item 32 will not be included in the calculation of the PBE scale total or the Physical Competence subscale totals used in the remainder of the analyses.

Based on the final version of the PBE (17 items) generated by factor analyses and item analysis, internal consistency for the scale total is very high (Cronbach's $\alpha = .94$), indicating relative homogeneity among the scale items and reflecting the strong primary factor indicated by the EFA eigenvalues and scree plot. Therefore we can likely conclude that the item subscales are highly related. Indeed, the subscales of the PBE were significantly and positively correlated. The Mind/Body Connection subscale was correlated .72 ($p < .01$) with the Body Acceptance subscale, .77 ($p < .01$) with the Physical Competence subscale, and .41 ($p < .01$) with the Physical Limits subscale. The Body Acceptance subscale was also correlated .71 ($p < .01$) with the Physical Competence subscale and .51($p <.01$) with the Physical Limits subscale. The Physical Limits subscale and Physical Competence subscale were correlated .42 ($p < .01$). The average inter-item correlation for the total scale was .46 and inter-item correlations ranged from -.01 to .80. The average item mean for the total scale was 5.12 and the average item variance was .11. The mean for the scale total was 87.07 ($SD = 18.83$), indicating that participants on average feel somewhat embodied as the result of their physical experiences.

Construct Validity

      Correlation Analyses. Following a nomological network approach to construct validation, the relationship between the PBE and other theoretically related variables were examined (Cronbach & Meehl, 1955). A series of one-tailed Pearson product-moment correlations were calculated for all study variables in Sample 1 (see Table 7 for correlations, scale means, and standard deviations). The PBE subscales were predicted to be positively correlated with other scale variables related to embodiment: body awareness, body responsiveness, and body appreciation. The results of the correlation analyses showed that the PBE was significantly correlated with socially desirable responding, as were several other measures included in the study. Therefore, the correlations were re-run partialling out social desirability (see Table 8).

Table 7.

Sample 1 correlations and descriptive statistics for all study variables.

	M^a	SD	1	2	3	4	5	6	7	8	9	10	11	12	15	16	17
1. PBE Total	5.00	1.06	(.94)														
2. PBE-MBC	23.60	6.80	.91**	(.90)													
3. PBE-BA	26.05	5.91	.89**	.72**	(.84)												
4. PBE-PC	30.85	6.99	.90**	.77**	.71**	(.85)											
5. PBE-PL	10.77	2.57	.59**	.41**	.51**	.42**	(.77)										
6. BAS	3.65	.81	.59**	.50**	.69**	.40**	.39**	(.95)									
7. BRS	4.65	.92	.66*	.59**	.68**	.54**	.38**	.53**	(.69)								
8. MBSRQ-AE	3.47	.97	.46**	.38**	.58**	.30**	.28**	.78**	.45**	(.93)							
9. OBC-BS	2.96	.93	-.23**	-.12**	-.34**	-.14**	-.22**	-.45**	-.32**	-.43**	(.81)						
10. OBC-S	4.57	1.09	-.21**	-.23**	-.23**	-.08*	-.17**	-.40**	-.24**	-.24**	.33**	(.77)					
11. BAQ	4.80	.95	.53**	.54**	.47**	.44**	.24**	.35**	.40**	.20**	-.02	-.19**	(.78)				
12. SOQ	.60	11.69	-.16**	-.17**	-.15**	-.10*	-.11*	-.16**	-.21**	-.04	.07	.20**	-.10*	-			
15. EDE-Q	2.83	1.37	-.24**	-.17**	-.37**	-.11*	-.18**	-.61**	-.30**	-.60**	.54**	.37**	-.04	.13**	(.95)		
16. RSES	1.8	.59	.46**	.35**	.53**	.36**	.36**	.54**	.49**	.55**	-.37**	-.15**	.18**	-.11*	-.45**	(.91)	
17. MCSD	49.08	5.22	.24**	.21**	.25**	.16**	.21**	.26**	.35**	.14**	-.11*	-.24**	.19**	-.25**	-.21**	-.27**	(.77)
18. BMI	23.82	4.99	-.26**	-.20**	-.34**	-.21**	-.05	-.38**	-.26**	-.47**	.22**	.06	-.14**	.01	.38**	.13**	.03

Note. * = p < .05; ** = p < .01; a = Means are represented as item means, except for Self-Objectification, Binge Frequency, Purge Frequency, Social Desirability, and BMI; Cronbrach's alpha reported in parentheses on the diagonal; PBE Total = scale total for Physical Body Experiences Questionnaire; PBE-MBC = Mind/Body Connection subscale of the PBE; PBE-BA = Body Acceptance subscale of the PBE; PBE-PC = Physical Competence subscale of the PBE; PBE-PL = Physical Limits subscale of the PBE; BAS = Body Acceptance Scale; BRS = Body Responsiveness Scale; MBSRQ-AE = Appearance Evaluation subscale of the Multi-dimensional Body-Self Relations Questionnaire; OBC-BS = Body Shame subscale of the Objectified Body Consciousness Scale; OBC-S = Surveillance subscale of the OBC; BAQ = Body Awareness Questionnaire; SOQ = Self-objectification Questionnaire; EDE-Q = Eating Disorder Examination Questionnaire; RSES = Rosenberg Self-Esteem scale; MCSD = Marlowe-Crowne Social Desirability Scale; BMI = Body Mass Index.

Table 8.

Sample 1 correlations and descriptive statistics for all study variables controlling for Social Desirability.

	M^a	SD	1	2	3	4	5	6	7	8	9	10	11	12	15	16	17
1. PBE Total	5.00	1.06	-														
2. PBE-MBC	23.60	6.80	.91	-													
3. PBE-BA	26.05	5.91	.88	.71**	-												
4. PBE-PC	30.85	6.99	.90	.77**	.70**	-											
5. PBE-PL	10.77	2.57	.57**	.40**	.49**	.40**	-										
6. BAS	3.65	.81	.56**	.48**	.66**	.37**	.35**	-									
7. BRS	4.65	.92	.64**	.57**	.65**	.53**	.34**	.49**	-								
8. MBSRQ-AE	3.47	.97	.45**	.36**	.56**	.29**	.26**	.77**	.43**	-							
9. OBC-BS	2.96	.93	-.22**	-.11*	-.34**	-.13*	-.20**	-.44**	-.32**	-.44**	-						
10. OBC-S	4.57	1.09	-.16**	-.19**	-.18**	-.05	-.12*	-.36**	-.17**	-.22**	.31**	-					
11. BAQ	4.80	.95	.51**	.52**	.45**	.42**	.21**	.32**	.37**	.18**	.00	-.15**	-				
12. SOQ	.60	11.69	-.10*	-.12*	-.09*	-.05	-.05	-.09*	-.13*	.00	.05	.15**	-.06	-			
15. EDE-Q	2.83	1.37	-.21**	-.14*	-.34**	-.08	-.13*	-.59**	-.25**	-.60**	.52**	.33**	-.01	.08*	-		
16. RSES	1.8	.59	.42**	.31**	.49**	.34**	.32**	.51**	.44**	.53**	-.36**	-.10*	.14*	-.05	-.42**	-	
17. BMI	23.82	4.99	-.27**	-.20**	-.34**	-.21**	-.05	-.37**	-.26**	-.47**	.22**	.06	-.14*	-.01	.38	-.12*	-

Note. * = p < .05; ** = p < .01; a = Means are represented as item means, except for Self-Objectification, Binge Frequency, Purge Frequency, and BMI; PBE Total = scale total for Physical Body Experiences Questionnaire; PBE-MBC = Mind/Body Connection subscale of the PBE; PBE-BA = Body Acceptance subscale of the PBE; PBE-PC = Physical Competence subscale of the PBE; PBE-PL = Physical Limits subscale of the PBE; BAS = Body Acceptance Scale; BRS = Body Responsiveness Scale; MBSRQ-AE = Appearance Evaluation subscale of the Multi-dimensional Body-Self Relations Questionnaire; OBC-BS = Body Shame subscale of the Objectified Body Consciousness Scale; OBC-S = Surveillance subscale of the OBC; BAQ = Body Awareness Questionnaire; SOQ = Self-objectification Questionnaire; EDE-Q = Eating Disorder Examination Questionnaire; RSES = Rosenberg Self-Esteem scale; BMI = Body Mass Index.

53

The results of the partial correlation analyses provided support for the initial hypotheses. The Mind/Body Connection subscale was significantly and positively correlation with body awareness ($r = .52$, $p < .01$), body responsiveness ($r = .57$, $p > .01$), and body appreciation ($r = .48$, $p < .01$). The Body Acceptance subscale was significantly and positively correlated with body awareness ($r = .45$, $p < .01$), body responsiveness ($r = .65$, $p < .01$), and body appreciation ($r = .66$, $p < .01$). The Physical Competence subscale was significantly and positively correlated with body awareness ($r = .42$, $p < .01$), body responsiveness ($r = .53$, $p < .01$), and body appreciation ($r = .37$, $p < .01$). Finally, the Physical Limits subscale was significantly correlated with body awareness ($r = .21$, $p < .01$), body responsiveness ($r = .34$, $p < .01$), and body appreciation ($r = .35$, $p < .01$).

The PBE was also hypothesized to be negatively related to self-objectification (a process which theoretically causes a person to become dis-connected from her/his body) and thus negatively related to several outcome variables of the self-objectification process: body shame and disordered eating. The MBC subscale and the BAA subscale were both significantly and negatively correlated with the two measures of self objection. The MBC subscale was negatively correlated with trait self-objectification ($r = -.12$, $p < .05$) and with self surveillance ($r = -.19$, $p < .01$) as was the BAA subscale which was correlated negatively with trait self-objectification ($r = -.09$, $p = .05$) and self-surveillance ($r = -.18$, $p < .01$). The PC subscale, however, was not significantly associated with either measure. The PL subscale was significantly associated with self-surveillance as hypothesized ($r = -.12$, $p < .05$) but was not significantly associated with trait self-objectification. Upon examining the outcomes associated with self-objectification, results indicated that the MBC subscale ($r = -.11$, $p < .05$), the BAA subscale ($r = -.34$, $p <.01$),

the PC subscale ($r = -.13$, $p < .01$), and the PL subscale ($r = -.20$, $p < .05$) were significantly and negatively correlated with body shame as was hypothesized. For disordered eating symptomatology, the MBC ($r = -.14$, $p < .01$), BAA ($r = -.34$, $p < .01$), and PL ($r = -.13$, $p < .01$) were all significantly and negatively associated. However, the PC subscale was not significantly related to disordered eating symptomatology. These results provide partial support for study hypotheses.

Multiple Regression Analyses. A series of simultaneous regression analyses were also conducted using Sample 1 in order to evaluate the unique variance associated with each of the PBE subscales in predicting the outcomes of self-objectification, disordered eating, body satisfaction, and positive body image (body appreciation). For all regression analyses, the PBE subscales were entered with social desirability (to control for socially desirable responding) as well as BMI and the Appearance Evaluation subscale of the MBSRQ in order to evaluate the incremental validity of the PBE. BMI was included in the regression analyses because it is a well established predictor of outcomes related to body image and disordered eating. The Appearance Evaluation subscale was included because it is a measure of general body satisfaction and also a well known predictor of body image-related and disordered eating outcomes.

Regression analyses were first performed to evaluate the ability of the PBE subscales to uniquely predict constructs related to embodiment: body responsiveness, body awareness, and positive body image (see Table 9). In predicting body responsiveness, the MBC and BAA subscales emerged as significant predictors of the outcome, above and beyond BMI and body satisfaction. Both the MBC and the BAA were positive predictors of body responsiveness ($\beta = .18$, $p < .01$ and $\beta = .38$, $p < .01$

respectively). The overall model was significant, $F_{(7, 397)} = 60.87$, $p < .01$, and the R^2 and adjusted R^2 values were .52 and .51 respectively. Body satisfaction also emerged as a significant predictor of body responsiveness ($\beta = .11$, $p < .05$). Examination of the squared semi-partial correlations revealed that the MBC subscale accounted for 1.1% unique variance while the BAA subscale accounted for 4.1% unique variance. The PL subscale and PC subscales were not significantly predictive of the outcome.

Table 9

Sample 1 multiple regression predicting variables related to embodiment.

Variable	B	β	t	p	sr^2
Body Responsiveness					
Mind/Body**	.17	.18	2.99	.003	.011
Body Acceptance**	.42	.38	5.78	.000	.041
Physical Competence	.06	.06	1.04	.298	.001
Physical Limits	.01	.01	.13	.894	.000
Appearance Satisfaction*	.11	.11	2.36	.019	.007
BMI	-.02	-.02	-.39	.700	.000
Desirable Responding**	.24	.19	5.21	.000	.033
Body Awareness					
Mind/Body**	1.05	.42	5.75	.000	.059
Body Acceptance**	.64	.22	2.82	.005	.014
Physical Competence	-.04	-.02	-.23	.817	.000
Physical Limits	-.19	-.03	-.56	.576	.001
Appearance Satisfaction	-.24	-.10	-1.72	.087	.005
BMI	-.09	-.03	-.57	.573	.001
Desirable Responding	.23	.07	1.61	.107	.005

Note. * = p < .05; ** = p < .01.

Table 9 (Continued).

Variable	B	β	t	p	sr^2
Positive Body Image					
Mind/Body*	.02	.12	2.55	.011	.005
Body Acceptance**	.04	.32	6.17	.000	.029
Physical Competence*	-.02	-.13	-2.80	.005	.006
Physical Limits*	.02	.05	1.56	.120	.002
Appearance Satisfaction **	.07	.55	15.06	.000	.172
BMI	.00	-.01	-.32	.750	.000
Desirable Responding**	-.01	-.09	-3.18	.002	.008

Note. * = p < .05; ** = p < .01.

The overall model for body awareness was also significant, $F(7, 397) = 25.36$, $p <$ .01). The R^2 value for the body awareness model was .31 and the adjusted R^2 was .30. Once again, the MBC ($\beta = .42$, $p < .01$) and BAA (($\beta = .22$, $p < .01$) subscales emerged as a significant positive predictors of the outcome as was previously hypothesized. No other predictors were significant, including BMI and body satisfaction. The MBC subscale uniquely accounted for 5.9% of the variance in body awareness and the BAA subscale uniquely account for 1.4% of the variance.

The overall model for positive body image was significant as well, $F(7, 397) =$ 132.54, $p < .01$, with three subscales of the PBE emerging as significant predictors of the outcome above and beyond BMI, body satisfaction, and socially desirable responding. The MBC subscale was once again a positive predictor of the outcome ($\beta = .12$, $p < .05$) as was the BAA subscale ($\beta = .32$, $p < .01$). These results were consistent with the study hypotheses. The PC subscale also emerged as a significant predictor, but it was a negative predictor of positive body image ($\beta = -.13$, $p < .01$). Body satisfaction ($\beta = .55$, $p < .01$)

significantly and positively predicted scores on the positive body image scale as well. The overall R^2 value for the model was .70 with an adjusted R^2 of .70. The MBC subscale accounted for .5% unique variance in the model while the BAA subscale accounted for 8.0% unique variance and the PC subscale accounted for .5% variance.

The fact that the PC subscale turned out to be a negative predictor of positive body image, despite its positive bivariate relationship with the outcome, was surprising. The results suggest that the PC subscale may be acting as a suppressor variable in the equation (Conger, 1974). Suppression occurs when the prediction of a criterion is substantially improved due to the addition of another criterion which is uncorrelated or has a small correlation with the criterion, but is correlated with the set of predictors (Conger, 1974), To evaluate the suppressor effects of the PC subscale, we began by removing predictors from the model one at time, rerunning the analysis each time, in order to determine the conditions of the suppressor effects. First, the two non-significant contributing variables were removed from the model. After removal of the PL subscale of the PBE and BMI, the suppressor effects remained (i.e., the PC subscale continued to contribute negatively and significantly to the criterion). The remaining model then included the MBC subscale, the BAA subscale, body satisfaction, and desirable responding all as significant predictors in addition to the PC subscale. A series of regression models were then run, excluding one predictor at a time in order to evaluate the effects on the suppressor variable. Results revealed that when either the MBC subscale or the BAA subscale were excluded from the model predictors, the suppressor effects of the PC subscale disappeared (i.e., the PC subscale was reduced to non-significance). Therefore, we can conclude that the inclusion of the PC subscale somehow

increases the predictive utility of the MBC and BAA subscales, most likely by accounting for irrelevant variance in the latter two subscales. Due to these effects, we do not necessarily conclude that increased physical competence negatively predicts positive body image.

For analyses predicting self-objectification, two regression analyses were conducted separately predicting trait-self objectification (the importance of appearance to one's physical self-concept; SOQ) and surveillance behaviors (body monitoring; S-OBC). Results for the self-objectification regression analyses can be found in Table 10. Results revealed a significant overall model in prediction self-surveillance, $F(7, 397) = 9.21$, $p <$ .01. The R^2 value for the model was .14 and the adjusted R^2 value was .13. Only the MBC and PC subscales of the PBE were significant predictors of self-surveillance and only the MBC subscale was a predictor in the hypothesized direction. The MBC subscale was a negative predictor of self-surveillance ($\beta = -.26$, $p < .01$) while the PC subscale was a positive predictor ($\beta = .27$, $p < .01$). Both subscales were significant in addition to body satisfaction and socially desirable responding. The BAA and PL subscales of the PBE and BMI were not significant predictors of self-surveillance. Again, the negative prediction of the PC subscale suggests the presence of a suppressor effect in relation to the MBC subscale of the PBE. Again running a series of simplified regression models by removing non-significant predictors and removing significant predictors one at a time confirmed the suppressor effects of the PC subscale. In the overall model, the MBC subscale predicted 2.3% unique variance and the PC subscale contributed 2.5% unique variance.

Table 10

Sample 1 Multiple regression analyses predicting self-objectification.

Predictors	B	β	t	p	sr^2
Self-Surveillance					
Mind/Body**	-.04	-.26	-3.27	.001	.023
Body Acceptance	-.02	-.10	-1.09	.279	.002
Physical Competence	.05	.27	3.38	.001	.025
Physical Limits*	-.02	-.04	-.79	.428	.001
Appearance Satisfaction**	-.02	-.15	-2.33	.020	.012
BMI	-.01	-.04	-.73	.465	.001
Desirable Responding**	.04	.18	3.67	.000	.030
Trait Self-Objectification					
Mind/Body*	-.33	-.19	-2.26	.024	.012
Body Acceptance	-.17	-.09	-.96	.340	.002
Physical Competence	.25	.14	1.63	.104	.006
Physical Limits	-.05	-.01	-.18	.855	.000
Appearance Satisfaction	.13	.08	1.17	.245	.003
BMI	-.02	-.01	-.16	.870	.000
Desirable Responding**	.51	.23	4.55	.000	.048

Note. * = p < .05; ** = p < .01

The overall regression model predicting trait-self objectification was also significant, $F(7, 396) = 5.52$, $p < .01$, and the only significant predictor to emerge was the MBC subscale of the PBE in addition to socially desirable responding. The MBC was a negative predictor of trait self-objectification ($\beta = -.19$, $p < .05$) as was hypothesized. The R^2 value for the model was small, though, (.09) and the adjusted R^2 value was only .07. The MBC subscale uniquely accounted for 1.2% of the variance in the model.

The PBE was also hypothesized to predict unique variance for variables related to general psychological well-being, such as disordered eating symptomatology and self-esteem (see Table 11). The overall model predicting disordered eating symptomatology was significant, $F(7, 397) = 38.89$, $p < .01$. The R^2 value for the model was .41 with an adjusted R^2 value of .40. The BAA subscale ($\beta = -.16$, $p < .05$) and the PC subscale ($\beta = .14$, $p < .05$) were significant predictors of disordered eating symptomatology in addition to body satisfaction, BMI, and socially desirable responding. The relationship between the BAA subscale and disordered eating symptomatology was in support of the study hypotheses. Once again, the PC subscale had the opposite relationship with the outcome from its bivariate relationship. After the removal of non-significant predictors and the BAA subscale, the PC subscale was no longer a significant predictor of the outcome, providing evidence again for the PC subscale as a suppressor variable. The BAA subscale, though, only contributed .7% unique variance to the overall regression model.

Lastly, the subscales of the PBE also contributed significantly to the prediction of self-esteem. The overall regression model was significant, $F(7. 397) = 41.25$, $p < .01$), and had an R^2 value of .43 and an adjusted R^2 value of .42. The BAA subscale ($\beta = .26$, $p < .01$) and the PC subscale ($\beta = .13$, $p < .05$) both contributed significantly to the self-

esteem outcome in the hypothesized direction. In this model, though, the MBC subscale emerged as a significant negative predictor ($\beta = -.14$, $p < .05$). The bivariate correlation between the MBC subscale and self-esteem was positive, though. Therefore, it is possible that in this model the MBC subscale is acting as the suppressor variable. Removal of the PL subscale (a non-significant predictor in the regression model) did not change the suppressor effects. Only after the PC subscale was removed from the model did the suppressor effects disappear and the MBC subscale's relationship to the criterion was reduced to non-significance. These results confirmed the suppressor effects of the MBC subscale. In addition to the BAA and PC subscales, body satisfaction, BMI, and socially desirable responding all also emerged as significant predictors of self-esteem. The BAA subscale accounted for 1.9% unique variance and the PC subscale accounted for .6% unique variance in the model.

Table 11

Sample 1 multiple regression analyses predicting eating disorder symptomatology and psychological well-being.

Predictors	B	β	t	p	sr^2
Disordered Eating					
Mind/Body	.02	.09	1.29	.200	.003
Body Acceptance*	-.04	-.16	-2.12	.035	.007
Physical Competence*	.03	.14	2.13	.034	.007
Physical Limits	-.01	-.02	-.45	.655	.000
Appearance Satisfaction **	-.10	-.50	-9.71	.000	.142
BMI**	.04	.13	2.98	.003	.013
Desirable Responding**	.03	.13	3.19	.002	.015

Note. * = p < .05; ** = p < .01.

Table 11 (Continued).

Predictors	B	β	t	p	sr^2
Self-Esteem					
Mind/Body*	-.01	-.14	-2.06	.040	.006
Body Acceptance**	.03	.26	3.57	.000	.019
Physical Competence*	.01	.13	2.03	.043	.006
Physical Limits	.02	.08	1.76	.080	.004
Appearance Satisfaction **	.04	.45	8.87	.000	.116
BMI**	.02	.18	4.06	.000	.024
Desirable Responding**	-.02	-.13	-3.23	.001	.015

Note. * = p < .05; ** = p < .01.

Confirmation of Factor Structure

Descriptive Statistics and Scale Reliability. Finally, a series of confirmatory factor analyses were conducted to evaluate the fit of the factor structure of the revised 18-item version of the 4-factor PBE in a second sample of undergraduate women (Sample 2). Analyses were planned to be conducted both with and without the problematic item. Of the 205 participants in Sample 2, 5 were excluded for failing to complete the PBE. Again, scale reliabilities and statistics were calculated for Sample 2 excluding item 32. Internal consistency for the total PBE in Sample 2 was .94 and the scale mean was 85.15, indicating that on average participants feel somewhat embodied as a result of their physical experiences. Inter-item correlations ranged from .16 to .78 and the average inter-item correlation was .49. Item means ranged from 4.41 to 5.55 and the average item mean was 5.00. The MBC subscale had an internal consistency of .87; the Body Acceptance

and Awareness subscale had an internal consistency of .87; the Physical Competence

subscale had an internal consistency of .90; and the Physical Limits subscale had an

internal consistency of .79. Once again one-tailed Pearson product-moment correlations

revealed that all factors were highly correlated. The MBC and BAA subscales were

correlated .70 ($p < .01$), the MBC and PC subscales were correlated .75 ($p < .01$), the

MBC and PL subscales were correlated .43 ($p < .01$), the BAA and PC subscales were

correlated .71 ($p < .01$), the BAA and PL subscales were correlated .57 ($p < .01$), and the

PC and PL subscales were correlated .53 ($p < .01$).

    Confirmatory Factor Analyses. The first confirmatory model tested was of the 18-

item PBE, including item 32 as part of the Physical Competency subscale (see Figure 7).

Overall results of the analysis indicated acceptable model fit. The overall chi-square

statistic was significant, $\chi^2(129) = 305.87$, p < .01, suggesting inadequate model fit.

However, several other fit indexes suggested acceptable to good model fit: CFI = .93,

NFI = .88, and RMSEA = .08 (90% CI = .07, .09). Loadings of observed variables onto

latent constructs were generally good with the exception of item 32 (.14). All other item

loadings ranged from .49 (item 4) to .89 (item 22). All factors were significantly

correlated: MBC and BAA ($r = .81$, $p < .01$), MBC and PC ($r = .83$, $p < .01$), MBC and

PL ($r = .52$, $p < .01$), BAA and PC ($r = .83$, $p < .01$), BAA and PL ($r = .71$, $p < .01$), and

PC and PL ($r = .62$, $p < .01$).

Figure 7. *Confirmatory factor model for the Physical Body Experiences Questionnaire tested in Sample 2.*
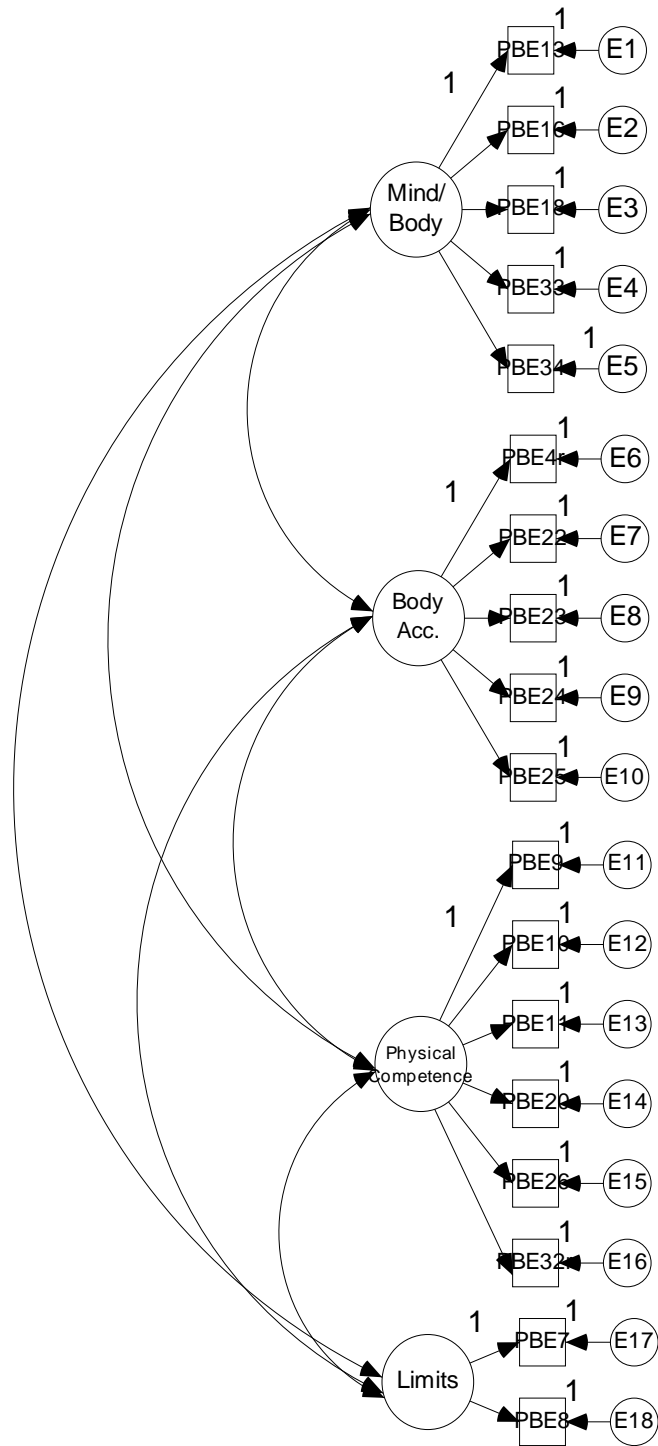
A second confirmatory analysis was conducted removing item 32 based on its low factor loading in order to assess for improvement of model fit. Overall, several fit indexes improved slightly and model fit remained acceptable. The chi-square statistic was reduced, but remained significant χ^2 (113) = 268.04, $p < .01$. The reduction in chi-square was statistically significant, $\Delta \chi^2$ (16) = 37.83, $p < .01$, suggesting significantly improved fit of the overall model. The remainder of the fit statistics showed marginal improvement. The CFI for the revised model was .94, the NFI was .89, and the RMSEA was .08. These statistics continue to suggest that 4 factor structure of the PBE has acceptable fit with the data. With the removal of item 32, all item loadings onto latent factors were statistically significant and ranged between .61 and .89.

Chapter 4

General Discussion

The aim of a series of studies was to develop a reliable and valid measure of embodiment. Current research in the areas of body image and objectification suggests that the cultural practice of reducing the value of women to their physical appearance (i.e., objectification) may result in negative mental health consequences (e.g., Fredrickson & Roberts, 1997). A review of the literature suggests that a state in which a woman feels more closely connected to and in tune with her body in a positive way may be protective against the negative effects of objectification. Key components of this positive, connected mind/body relationship were theorized to include an internal body focus, care for the body, feelings of physical freedom and functionality, awareness of the body's internal sensations, and comfort with voicing the body's needs – a state which has been termed embodiment (Piran et al., 2002). Given that no quantitative measure has yet to capture the state of embodiment, an attempt was made to construct a self-report measure that characterizes this state.

The initial items for inclusion in the scale were developed based on literature review and focus groups with athletes, a group which theoretically is very in tune with and knowledgeable of the body. The items were reviewed by experts in the fields of body image, objectification, disordered eating, and sports psychology and edited based on their feedback. The items covered the major themes and content areas of (1) trust of the body,

(2) body acceptance, (3) body awareness and care, (4) self-discovery through physical skill, and (5) appreciation of physical competence. The initial set of items demonstrated good internal consistency and test-retest reliability, but the items were unable to be factor analyzed due to small sample size (Menzel & Levine, 2008). The items were then amended to be applicable to a general population. The resulting scale was termed the Physical Body Experiences scale (PBE) and contained 32-items.

Results of the pilot study indicated problems with item wording in the first version of the PBE. An exploratory factor analysis indicated the presence of two primary factors, which were respectively composed of solely positively worded items and solely negatively worded items. A series of confirmatory factor analytic models confirmed the presence of method effects, meaning that factors were the result of item wording and not meaningful differences in item content. Based on these results, several revisions were made to the PBE. Several longer items were broken down into shorter items; negatively worded items were rewritten in the positive direction; and only three negatively worded items were included in the total scale (the negative direction of the item was determined by changing the content of the item and not by the inclusion of adverb qualifiers such as "not" or "never"). The revised version of the PBE then contained 36 items.

The aim of Study 1 was to determine the underlying factor structure of the revised, 36-item PBE and to evaluate its internal consistency reliability and construct validity. Results from both studies suggest that the PBE consists of 4 underlying factors related to physical embodying experiences: (1) mind/body connection, (2) body acceptance, (3) physical competence, and (4) knowledge of physical limits. While these

factors differentiated from the hypothesized factors, they do relate on a content level to previous definitions of embodiment (e.g., Piran et al., 2002). The Mind/Body Connection subscale contains 5 items that reflect the interaction between things such as thoughts, energy, physicality, awareness, and the sense of self. The Body Acceptance subscale contains 5 items that reflect an evaluative sense of liking, comfort, trust, care, and agency concerning the body. The Physical Competence scale encompasses 5 items pertaining to the use of the body to engage in physical activity and the relationship between the mind and the body involved in taking on new physical challenges and learning new physical skills. The Physical Limits subscale is comprised of 2 items that reflect general awareness of physical limitations (e.g., knowing what physical actions might be result in injury) and respect for those limitations (e.g., knowing what might results in injury and then choosing not to engage in that activity). Results indicate good internal consistency and item statistics for the 4 subscales and that the 4 subscales are associated with convergent constructs in the expected manner.

Only one item emerged as problematic: "I feel uncomfortable pushing my body's physical limits". This item, a reverse scored item, if removed from the scale caused the factor structure of the PBE to dissolve, i.e., the elimination of several items for cross loadings onto multiple factors. The resulting factor structure caused the elimination of all Mind/Body Connection items except for 1 and the combining of the Physical Competence subscale and the Body Acceptance subscale. The Physical Limits subscale remained intact. Therefore, to retain a more meaningful factor structure and a greater number of items that covered greater areas of content, the problematic item and the 4

factor structure was retained. Currently, the problematic item loads onto the Physical Competence factor, although it clearly addresses physical limitation, the content of the Physical Limits factor. Therefore, another reason for retaining the items was for future rewording of the item and its potential contribution to the Physical Limits subscale.

The aim of Study 2 was to confirm the factor structure of the PBE in a second sample. These analyses were run with and without the problematic item so as to evaluate its performance in the 4 factor model. The results of the confirmatory factor analyses revealed acceptable model fit for the 4 factor model both with and without the problematic item. Fit statistics were marginally but significantly improved with the deletion of the item. These results confirm the factorial validity of the 4 factor structure of the PBE determined in Study 1. All factor loadings of items onto each latent factor were very high and all factors were intercorrelated significantly.

Results from Study 1 indicated that the Mind/Body Connection subscale showed evidence of good construct validity. The Mind/Body Connection subscale was strongly associated in a positive direction with body awareness and body responsiveness. These results suggest that having a close connection between mind and body is associated with better internal awareness of internal body sensations (e.g., sickness, injury, fatigue) and also a greater desire and ability to respond to these internal sensations in an appropriate way (e.g., when sick, you give the body rest). The mind/body connection is a hallmark of embodiment definitions and the ability to be aware of and respond to the body's needs is a characteristic of qualitative descriptions of the embodied person, lending support to the construct validity of the Mind/Body Connection subscale. In support of this theory, the

70

Mind/Body Connection subscale emerged as a significant predictor of body awareness in regression analyses. The Mind/Body Connection subscale was also significantly associated with positive body image. Again, embodiment theory states that the state of embodiment represents a loving and healthy relationship with one's body and therefore it makes sense theoretically that the Mind/Body Connection subscale would be associated with a more positive body image.

In terms of self-objectification, the results of Study 1 also suggest that the Mind/Body Connection subscale has the greatest validity in the prediction of the self-objectification – both trait self-objectification and self-surveillance. Again, self-objectification theory states that as the result of living in a society that places great value and emphasis on the physical appearance of women, women will, over time, come to be more attentive to and aware of their external (appearance) characteristics and thus become disconnected from their internal states and needs (e.g., health and energy level; Fredrickson & Roberts, 1997). Therefore, if a woman has less internal, body-focused awareness, she would have a weaker mind/body connection and be less likely to be in a highly embodied state. In support of this theory, the Mind/Body Connection subscale was negatively associated with both self-surveillance (body monitoring) and trait-self-objectification (the valuation of physical appearance), suggesting that indeed a stronger mind/body connection may be associated with greater internal focus and awareness and less of an external focus on appearance. Furthermore, after accounting for general body satisfaction, BMI, and socially desirable responding, the Mind/Body Connection subscale was a significant predictor of both self-objectification variables, although it accounted for

71

only a small amount of variance in the two constructs. These results lend preliminary support for the construct validity of the Mind/Body Connection subscale.

The Body Acceptance subscale also demonstrated positive associations with constructs related to embodiment in support of Study 1 hypotheses. Results indicated that the Body Acceptance scale was associated with body awareness, strongly associated with body responsiveness, and strongly associated with body appreciation (positive body image). These results suggest that feelings of liking, pride, and a sense of instrumentality concerning the body may be linked to greater internal awareness, desire to care for the body, and a positive body image. The high correlation between the Body Acceptance subscale and the positive body image scale can be partly attributed to some overlap in item content. However, the positive body image scale has a greater number of items pertaining directly to physical appearance while the Body Acceptance scale does not. The Body Acceptance scale taps more into the concept of liking the body for its ability to be instrumental physically. Furthermore, Body Acceptance was a significant predictor of positive body image above and beyond appearance satisfaction. Body Acceptance was also a significant predictor of body responsiveness.

Results also showed, however, that the Body Acceptance scale was weakly and negatively correlated with self-objectification variables and not a significant predictor of these variables once the other PBE subscales and general body image had been taken into account. Due to the fact that self-objectification is believed to be a matter of the direction of conscious awareness, it seems reasonable that the Mind/Body Connection subscale would be a better predictor of self-objectification as opposed to the Body Acceptance

72

subscale. On the other hand, though, the Body Acceptance scale was significantly and negatively associated with body shame, an outcome variable that has been strongly tied to self-objectification in previous studies (e.g., Calogero et al., 2005; Daubenmier, 2005). Furthermore, the Body Acceptance subscale was also negatively correlated with disordered eating and positively correlated with self-esteem and body satisfaction. These constructs have all been linked to self-objectification (e.g., Calogero et al., 2005; Fredrickson & Roberts, 1997). In addition, the Body Acceptance subscale is a significant predictor of body responsiveness, a construct that has been shown to mediate the relationship between self-objectification and disordered eating (Calogero et al., 2005; Daubenmier, 2005). Therefore, while the Body Acceptance subscale, may not have a strong relationship with self-objectification, it could still be a potential protective factor against some of the negative outcomes of self-objectification. In summary, there seems to be support for the construct validity for the Body Acceptance subscale.

The evidence for the construct validity of the Physical Competence subscale was much less clear cut. Results of correlation analyses in Study 1 indicated that the Physical Competence subscale was related to constructually related variables in the hypothesized manner. The subscale was positively associated with body awareness, body responsiveness, and positive body image, which suggests that being more physically competent (i.e., being confident and able to engage in physical activity and use the body in a physical way) is related to better internal awareness and willingness to respond to physical needs. These results also suggest that being more physically competent is related to more positive opinions of the body. Furthermore, being physically competent was

associated with increased body satisfaction, increased self-esteem, and weakly to decreased levels of disordered eating. After controlling for the tendency to respond to questions in a socially desirable way, the Physical Competence subscale was not significantly related to self-objectification variables which did not support the study hypotheses. This result was especially surprising concerning the subscale's relationship with the self-objectification questionnaire because the self-objectification questionnaire assesses valuation of physical appearance and physical competence.

Another complication in interpreting the Physical Competence subscale was that it acted as a suppressor variable in many of the regression analyses predicting self-objectification, embodiment variables, and disordered eating. The inclusion of the Physical Competence subscale in analyses resulted in the enhancement of the predictive utility of the Mind/Body Connection and the Body Acceptance subscales in several analyses. These suppressor effects caused the predictive relationship of the Physical Competence subscale to become negative (which was the direct opposite of its relationships in the bivariate analyses). These results were unexpected. Suppressor effects are often observed when there is a great deal of shared variance between two predictors and a criterion. This case was true for the three subscales of the PBE which were highly correlated. Thus, Physical Competence acted as a suppressor variable in the prediction of the following variables: self-surveillance, disordered eating, and positive body image. These results may be interpreted to mean that after controlling for either mind/body connection or body acceptance, physical competence is negatively related to self-surveillance, disordered eating, and a positive body image. In other words, physical

competence is only positively associated with these outcomes insofar as it is also associated with either a greater mind/body connection or greater body acceptance.

The reverse suppressor relationship was observed in the prediction of self-esteem. In this model, it was the Mind/Body Connection subscale that suppressed the effects of the Physical Competence subscale on self-esteem. The Mind/Body Connection subscale was identified as a suppressor variable because it had the opposite sign in the regression equation (negative) than it did in the bivariate correlation (positive). In this case, we can interpret the effects to mean that after controlling for physical competence, a stronger mind/connection is related to lower self esteem. These results contradict previous analyses in which the Mind/Body Connection subscale has been a positive predictor of outcomes that were also positively correlated with self-esteem (i.e., positive body image). It should be noted that in predicting self-esteem, both the Physical Competence subscale and the Mind/Body Connection subscale accounted for less than 1% unique variance in the model.

Nevertheless, the construct validity of the Physical Competence subscale is mediocre at best. The results of the regression analyses seem to suggest that the Physical Competence subscale is only useful as an indicator of embodied experience to the extent that it predicts a connection between the mind and body or acceptance of the body. Therefore, it is possible that the relationship between physical activity and a number of the outcomes studied (e.g., positive body image and self-objectification) is mediated by the mind/body connection and acceptance that characterize embodiment. These hypotheses need to be evaluated in future research.

The validity of the Physical Limits dimension also remains in question. The 2-item scale, although it showed evidence of good internal consistency and high, distinct factor loadings, did not significantly predict any of the outcome variables in regression analyses. The subscale was correlated, though, with body awareness, body responsiveness, and positive body image which provided support for Study 1's initial hypotheses. These correlations indicate that greater knowledge of physical limits is associated with better internal awareness, ability to respond to body needs, and a positive view of the body. Furthermore, the scale was negatively associated with self-surveillance, indicating that being in greater touch with one's body's physical limitations is also associated with less conscious monitoring of one's physical appearance. The subscale was also weakly, but negatively correlated with disordered eating, negatively associated with body shame, and positively associated with self-esteem. Therefore, the bivariate analyses lend some initial support to the validity of the Physical Limits subscale, but regression analyses do not support that the subscale provides unique information above and beyond the other subscales of the PBE. Perhaps in the future with the addition of new items to the subscale, there will be enough variability for the Physical Limits scale to have greater criterion validity.

Lastly, it should be noted that all subscales of the PBE were significantly correlated with BMI except for the Physical Limits subscale. These results indicate that a lower BMI is associated with greater embodiment. This relationship could be the result of the PBE's physical activity content. Many of the items in the PBE are related to physical activity and the theory states that being physically active would lend itself to more

opportunities to have embodied experiences. Therefore, if greater embodiment is related to being more physically active, then we might also expect it to be related to lower BMI. BMI was also significantly correlated with all outcome variables with the exception of self-surveillance.

Implications

In conclusion, the Mind/Body Connection and the Body Acceptance subscales provided the most support for the hypotheses concerning the relationship between the newly created measure of embodiment and a number of related variables. Furthermore, these scales seem to be the most promising predictors of variables related to embodiment and positive body image. These scales also seem to provide unique information in the prediction of self-objectification and psychological well-being (i.e., disordered eating and self-esteem). These findings have implications for the study of positive body image and self-objection. Both subscales may be used to study factors that may be involved in the development of positive body image and the Mind/Body Connection subscale could be used in future studies in evaluating factors and processes involved in reducing the effects of self-objectification. Research in body image and disordered eating has long debated the merit of physical activity, specifically athletics, in preventing body image disturbance and disordered eating. These results provide insight into better describing the relationship between physical activity and mental health benefits by potentially qualifying the conditions under which physical activity may be helpful. Specifically, physical activity that results in greater feelings of pride and agency concerning the body and a deeper mind/body connection could provide the greatest mental health benefits.

Limitations

Several limitations of the study do exist, though. The samples for each study were female only and consisted of primarily Caucasian women. Therefore, these results may not generalize to women of other ethnicities. Additional research is needed to validate in the PBE in more diverse samples as well as samples of men. A second weakness of the study was the weak factor structure of the PBE. Conflicting statistics from the exploratory factor analyses suggested that a one factor solution might be the best fit for the data and approximately half the items from the initial PBE were eliminated for factor overlap. Furthermore, the retained factors were highly correlated. Lastly, the Physical Limits subscale contains only 2-items and will need to be expanded in future studies with the addition of new items to determine whether or not it will have any utility as a unique subscale. However, the results of multicollinearity testing, bivariate, and multivariate analyses do suggest that the subscales of the PBE are distinct and demonstrate good preliminary construct validity. Furthermore, confirmatory factor analyses also supported the factorial structure of the scale. Lastly, the fact that the items for the scale were developed through qualitative methods, including focus groups and expert reviews, lend good face and content validity to the scale as a measure of embodiment.

Conclusions

The results of these studies indicate that the PBE has four dimensions that assess four factors related to embodiment: mind/body connection, body acceptance, physical competence, and physical limitations. All of the subscales were internally reliable and related to constructs representing embodiment, body image, self-objectification, and

psychological well-being in the hypothesized way. However, these preliminary results suggest that only the mind/body connection and body acceptance subscales may be uniquely predictive of these related outcomes. Specifically, a deep mind/body connection is related to lower levels of self-surveillance, less trait self-objectification, greater body awareness, greater body responsiveness, and a more positive body image. Body acceptance is related to a more positive body image, lower levels of disordered eating, greater body awareness, greater body responsiveness, and higher levels of self-esteem. As suggested by the trends in the Positive Psychology movement, these two subscales should be studied in the future as possible factors in the development of positive body image and therefore protective against negative mental health consequences. Furthermore, these two scales may be helpful in identifying the types of physical activities and the conditions under which physical activity in general may be related to mental health benefits. These two avenues of research are very important to the future study of embodiment, self-objectification, and body image disturbance. With the continued revision and reliability testing of the full scale and development of the Physical Competence and Physical Limits subscale of the PBE, the PBE could be a useful tool in the future study of positive mental health.

References

Avalos, L., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development and psychometric evaluation. *Body Image, 2*, 285-297.

Blinde, E. M., Taub, D. E., & Han., L. (2001). Sport participation and women's personal empowerment: Experiences of the collegiate athlete. In A. Yiannakis & M. J. Melnick (Eds), *Contemporary issues in sociology of sport* (pp. 159-168). Champaign, IL: Human Kinetics.

Brown, T.A., Cash, T.F., & Mikulka, P.J. (1990). Attitudinal body image assessment: Factor analysis of the Body-Self Relations Questionnaire. *Journal of Personality Assessment*, 55, 135-144.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models*, pp. 136-162. Beverly Hills: Sage.

Calogero, R., Davis, W., & Thompson, J. K. (2005). The role of self-objectification in the experience of women with eating disorders. *Sex Roles, 52*, 43-50.

Cash, T., & Pruzinsky, T. (2002). Future challenges for body image theory, research, and clinical practice. In T. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research and clinical practice* (pp. 509-516). New York: The Guilford Press.

Conger, A. J. (1974). A revised definition for suppressor variables: A guide to their identification and interpretation. *Educational and Psychological Measurement, 34*, 35-46.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349-354.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: Harper & Row.

Daubenmier, J. (2005). The relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating. *Psychology of Women Quarterly, 29*, 207-219.

DiStefano, C., & Motl, R. W. (2006). Further investigating method effects associated with negatively worded items on self-report surveys. *Structural Equation Modeling, 13,* 440-464.

Dorland, J. M. (2006). *Objectification theory: Examining the relation between self-objectification and flow for college-aged women athletes.* Unpublished doctoral dissertation, University of Akron, OH. Retrieved February 2, 2009, from http://www.ohiolink.edu/etd/view.cgi?acc_num=akron1163634310.

Downs, D. M., James, S., & Cowan, G. (2006). Body objectification, self-esteem, and relationship satisfaction: A comparison of exotic dancers and college women. *Sex Roles, 54,* 745-752.

81

Fairburn, C. G., & Beglin, S. (2008). Eating Disorder Examination Questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.), *Cognitive behavior therapy and eating disorders*. New York: Guilford Press.

Fairburn, C. G., Cooper, Z., & O'Connor, M. (2008). Eating Disorder Examination. In C. G. Fairburn, *Cognitive behavior therapy and eating disorders*. New York: Guilford Press.

Fiske, D. (1987). Construct invalidity comes from method effects. *Educational and Psychological Measurement, 47*, 285 – 307.

Forbes, G. B., Collinsworth, L. L., Jobe, R. L., Braun, K. D., & Wise, L. M. (2007). Sexism, hostility toward women, and endorsement of beauty ideals and practices: Are beauty ideals associated with oppressive beliefs? *Sex Roles, 56,* 265-273.

Frederick, D. A., Forbes, G. B., Grigorian, K. E., & Jarcho, J. M. (2007). The UCLA Body Project I: Gender and ethnic differences in self-objectification and body satisfaction among 2,206 undergraduates. *Sex Roles, 57,* 317-327.

Fredrickson, B., & Roberts, T. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*, 173-206.

Fredrickson, B., Roberts, T., Noll, S., Quinn, D., & Twenge, J. (1998). That swimsuit becomes you: Sex differences in self-objectification, restrained eating, and math performance. *Journal of Personality and Social Psychology, 75*, 269-284.

Garner, D. (2004). *Eating Disorder Inventory-3*. Lutz, FL: Psychological Assessment Resources, Inc.

Grabe, S., Hyde, J., & Lindberg, S. M. (2007). Body objectification and depression in

adolescents: The role of gender, shame, and rumination. *Psychology of Women

Quarterly, 31,* 164-175.

Greenleaf, C. (2005). Self-objectification among physically active women. *Sex Roles, 52*,

51-62.

Hebl, M. R., King, E. B., & Lin, J. (2004). The swimsuit becomes us all: Ethnicity,

gender, and vulnerability to self-objectification. *Personality and Social

Psychology Bulletin, 30,* 1322-1331.

Herbozo, S., & Thompson, J. K. (2006). Appearance-related commentary, body image,

and self-esteem: Does the distress associated with the commentary matter? *Body

Image, 3*, 255-262.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure

analysis: Conventional criteria versus new alternatives. *Structural Equation

Modeling, 6,* 1-55.

Impett, E. A., Daubenmier, J. J., & Hirschman, A. L. (2006). Minding the body: Yoga,

embodiment, and well-being. *Sexuality Research & Social Policy, 3,* 39-48.

Impett, E. A., Schooler, D., & Tolman, D. L. (2006). To be seen and not heard: Feminist

ideology and adolescent girls' sexual health. *Archives of Sexual Behavior, 35,*

131-144.

Jackson, S., Kimiecik, J., Ford, S., & Marsh, H. (1998). Psychological correlates of flow

in sport. *Journal of Sport and Exercise Psychology, 20*, 358-378.

Kazdin, A. E., Kraemer, H. C., Kessler, R. C., & Kupfer, D. J. (1997). Contributions of

    risk factor research to developmental psychopathology. *Clinical Psychology*

    Review, 17, 375-406.

Keery, H., van den Berg, P., & Thompson, J. K. (2004). An evaluation of the Tripartite

    Influence Model of body dissatisfaction and eating disturbance with adolescent

    girls. *Body Image, 1*, 237-251.

Kozee, H. B., & Tylka, T. L. (2006). A test of objectification theory with Lesbian

    women. *Psychology of Women Quarterly, 30,* 348-357.

Kozee, H. B., Tylka, T. L., Augustus-Horvath, C. L., & Denchik, A. (2007).

    Development and psychometric evaluation of the Interpersonal Sexual

    Objectification Scale. *Psychology of Women Quarterly, 31,* 176-189.

Krane, V., Choi, P. Y. L., Baird, S. M., Aimar, C. M., & Kauer, K. J. (2004). Living the

    paradox: Female athletes negotiate femininity and muscularity. *Sex Roles, 50*,

    315-239.

Levine, M. P., & Piran, N. (2004). The role of body image in the prevention of eating

    disorders. *Body Image, 1,* 57-70.

Marsh, H. W. (1996). Positive and negative global self-esteem: A substantively

    meaningful distinction or artifacts? *Journal of Personality and Social Psychology,*

    70, 810-819.

McKinley, N., & Hyde, J. (1996) The Objectified Body Consciousness Scale:

    Development and validation. *Psychology of Women Quarterly, 20*, 181-215.

Menzel, J. E., & Levine, M. P. (in press). Competitive athletics as a context for

    embodying experiences and the promotion of positive body image. In R. Calogero

    and J. K. Thompson (Eds.), *The objectification of women: Innovative directions in*

    research and practice. Washington, D.C.: American Psychological Association.

Menzel, J., & Levine, M. P. (2007). *Female athletes and embodiment: Development and*

    validation of the Athlete Body Experiences Questionnaire. Poster presented at the

    annual convention of the American Psychological Association, San Francisco,

    CA.

Mond, J. M., Hay, P. J., Rodgers, B., & Owen, C. (2006). Eating Disorder Examination-

    Questionnaire (EDE-Q): Norms for young adult women. *Behavior Research and*

    Therapy, 44, 53-62.

Noll, S., & Fredrickson, B. (1998). A mediational model linking self-objectification,

    body shame, and disordered eating. *Psychology of Women Quarterly, 22*, 623-

    636.

Parsons, E., & Betz, N. (2001). The relationship of participation in sports and physical

    activity to body objectification, instrumentality, and locus of control among

    young women. *Psychology of Women Quarterly, 25*, 209-222.

Peterson, C., Crosby, R., Wonderlich, S., Joiner, T., Crow, S., Mitchell, J., et al. (2007).

    Psychometric properties of the Eating Disorders Examination-Questionnaire:

    Factor structure and internal consistency. *International Journal of Eating*

    Disorders, 40, 386-389.

Piran, N. (1999). The reduction of preoccupation with body weight and shape in schools: A feminist approach. In N. Piran, M. P. Levine, & C. Steiner-Adair (Eds.), *Preventing eating disorders: A handbook of interventions and special challenges* (pp. 148-159). Philadelphia: Brunner/Mazel.

Piran, N. (2001). Re-inhabiting the body from the inside out: Girls transform their school environment. In D. L. Tolman & M. Brydon-Miller (Eds.), *From subjects to subjectivities: A handbook of interpretative and participatory methods* (pp. 218-238). New York: NYU Press.

Piran, N. (2002). Embodiment: A mosaic of inquiries in the area of body weight and shape preoccupation. In S. M. Abbey (Ed.), *Ways of knowing in and through the body: Diverse perspectives on embodiment* (pp. 211-214). Welland, Ontario: Soleil Publishing.

Piran, N., Carter, W., Thompson, S., & Pajouhandeh, P. (2002). Powerful girls: A contradiction in terms? Young women speak about the experience of growing up in a girl's body. In S. Abbey (Ed.), *Ways of knowing in and through the body: Diverse perspectives on embodiment* (pp. 206-210). Welland, Ontario: Soleil Publishing.

Piran, N., & Cormier, H. C. (2005). The social construction of women and disordered eating patterns. *Journal of Counseling Psychology, 52,* 549-558.

Quinn, D., Kallen, R., Twenge, J., & Fredrickson, B. (2006). The disruptive effect of self-objectification on performance. *Psychology of Women Quarterly, 30*, 59-64.

Richman, E., & Shaffer, D. (2000). "If you let me play sports": How might sport

    participation influence the self-esteem of adolescent females? *Psychology of*

    Women Quarterly, 24, 189-199.

Roberts, T.-A., & Gettman, J. Y. (2004). Mere exposure: Gender differences in the

    negative effects of priming a state of self-objectification. *Sex Roles, 51,* 17-27.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press:

    Princeton, NJ.

Rubin, L. R., Nemeroff, C. J., & Russo N. F. (2004). Exploring feminist women's body

    consciousness. *Psychology of Women Quarterly, 28,* 27-37.

Russell, K. (2004). On versus off the pitch: The transiency of body satisfaction among

    female rugby players, cricketers, and netballers. *Sex Roles, 51*, 561-574.

Russell, W. D. (2001). An examination of flow state occurrence in college athletes.

    Journal of Sport Behavior, 24, 83-107.

Shields, S., Mallory, M., & Simon, A. (1989). The Body Awareness Questionnaire:

    Reliability and validity. *Journal of Personality Assessment, 53*, 802-815.

Smolak, L., & Murnen, S. (2004). A feminist approach to eating disorders. In J. K.

    Thompson (Ed.), *Handbook of eating disorders and obesity* (pp. 590-605).

    Hoboken, NJ: John Wiley and Sons.

Smolak, L., & Murnen, S. K. (2007). Feminism and body image. In V. Swami & A.

    Furnham (Eds.), *The body beautiful: Evolutionary and socio-cultural perspectives*

    (pp. 236-258). London: Palgrave Macmillan.

Smolak, L., Murnen, S. K., & Ruble, A. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27*, 371-380.

Steer, A., & Tiggemann, M. (2008). The role of self-objectification in women's sexual functioning. *Journal of Social and Clinical Psychology, 27*, 205-225.

Swami, V. (2009). Body appreciation, media influence, and weight status predict consideration of cosmetic surgery among female undergraduates. *Body Image, 6*, 315-317.

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance.* Washington, DC: American Psychological Association.

Tiggemann, M., & Kuring, J. (2004). The role of body objectification in disordered eating and depressed mood. *British Journal of Clinical Psychology, 43*, 299-311.

Tylka, T., & Hill, M. (2004). Objectification theory as it relates to disordered eating among college women. *Sex Roles, 51*, 719-730.

Tylka, T., & Subich, L. (2004). Examining a multidimensional model of eating disorder symptomatology among college women. *Journal of Counseling Psychology, 51*, 314-328.

Van Wolputte, S. (2004). Hang on to your self: Of bodies, embodiment, and selves. *Annual Review of Anthropology, 33*, 251-269.

Appendices

Appendix A: Demographic Information

1. Gender _____

2. Age _____

3. Year in School (please choose one):
- First Year
- Second Year
- Third Year
- Fourth Year
- Other: _____

4. Ethnicity (please select all that apply):
- American Indian or Alaskan Native
- African American or Black
- Asian
- Native Hawaiian or Pacific Islander
- Hispanic or Latina
- White
- Some other race: _____

5. Sexual Orientation (please select the term that best fits you):
- Homosexual
- Heterosexual
- Bisexual
- Asexual
- Other: _____

History of Physical Activity Questions

For the following questions, please consider any physical activity you do outside of sports involvement.

6. How many days of the week do you do structured exercise or some form of physical activity? (please select one):
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days

Appendix A: (Continued)

- 7 days

7. If you exercise regularly, at **what age** did you begin to exercise regularly?

- _____
- N/A (I have never exercised regularly)

8. Do you have a membership to a fitness/health club or gym (including on campus)?

- YES
- NO

9. One the days that you exercise, approximately how much time do you spend exercising?

- <1 hour
- 1-2 hours
- 2-4 hours
- 4-6 hours
- >6 hours

10. What percent of the time do you spend thinking about exercise each day?

   0%-----10%-----20%-----30%-----40%-----50%-----60%-----70%-----80%-----90%-----100%

11. What percent of the time do you exercise with others?

   0%-----10%-----20%-----30%-----40%-----50%-----60%-----70%-----80%-----90%-----100%

12. Would you describe yourself as an overexerciser?

- YES
- NO

13. Please identify any physical barriers you may have to performing exercise in the space below (for example, disability, injury, cost, access).

   _____

   _____

History of Athletic Involvement Questions

14. Please indicate the total number of years that you have been involved in organized, competitive sports:

- _____
- N/A (never have competed in sports)

15. Did you compete in a **varsity** sport(s) in high school?

- YES
- NO

16. If yes, please indicate which sport or sports (please select one):

	Sport 1	Sport 2	Sport 3
None (N/A)			
Basketball			
Cheerleading			
Cross county			
Diving			
Field hockey			
Golf			
Soccer			
Lacrosse			
Gymnastics			
Ice hockey			
Rowing			
Softball			
Swimming			
Tennis			
Track and Field			
Volleyball			
Water polo			
Other: _____			

17. Please indicate the total number of years you actively participated in varsity sports in high school:
- 1 year
- 2 years
- 3 years
- 4 years
- None (N/A)

18. Did you or do you compete in an NCAA sport?

- YES
- NO

19. If yes, please indicate which sport(s) and what division (i.e., I, II, or III).

<u>Sport 1</u>   <u>Sport 2</u>   <u>Sport 3</u>
- None (N/A)
- Basketball
- Cheerleading
- Cross county
- Diving
- Field hockey
- Golf
- Soccer
- Lacrosse
- Gymnastics
- Ice hockey
- Rowing
- Softball
- Swimming
- Tennis
- Track and Field
- Volleyball
- Water polo
- Other: _____

20. Please indicate the total number of years you actively participated in NCAA sports in college:

- 1 year
- 2 years
- 3 years
- 4 years

21. Are you currently competing in a sport?

- YES
- NO

22. If you indicated YES for the previous question and you are currently competing in a sport, please indicate the level at which you are currently competing:

- Recreational or Intramural
- Organized competitive club (e.g., AAU Basketball, USA Swimming, etc.)
- Amateur (compete as an individual or on a privately sponsored team, e.g., as in marathon runner, triathlete, cyclist, etc.)
- Collegiate (Division III)
- Collegiate (Division I or II)
- Professional
- N/A

23. Have you EVER competed in a sport?

- YES
- NO

24. If you indicated YES for the previous question and have competed in a sport at some point in your life, please indicate the highest level at which you competed in any sport:

- Recreational or Intramural
- Varsity High School
- Organized competitive club (e.g., AAU Basketball, USA Swimming, etc.)
- Amateur (compete as an individual or on a privately sponsored team, e.g., as in marathon runner, triathlete, cyclist, etc.)
- Collegiate (Division III)
- Collegiate (Division I or II)

- Professional
- N/A

25. Please check any of the categories below that apply to how you identify yourself now or have ever identified yourself in the past.

- Athlete
- Gymnast
- Dancer
- Ice Skater
- Body builder
- Weightlifter
- Triathlete
- Competitive dance/cheerleading/acrobatics
- Martial arts
- Fitness instructor (e.g., jazzercise, aerobics, pilates)
- Yoga enthusiast

Appendix B: Physical Body Experiences Questionnaire

Revised June 8, 2009

We are interested in the experiences that people have during physical activity. There are many different ways in which a person can be physically active. Read each statement below and indicate to what extent each statement is true of you. Try to rate each statement as honestly and accurately as possible.

Based on my experiences being physically active....	**Not at all true about me.**				**Very true about me.**		
1. I feel that my body is a source of strength.	1	2	3	4	5	6	7
2. I feel that my body is a source of endurance.	1	2	3	4	5	6	7
3. I feel that my body is a source of energy.	1	2	3	4	5	6	7
4. I feel ashamed of my body.	1	2	3	4	5	6	7
5. I feel I am capable of special physical accomplishments.	1	2	3	4	5	6	7
6. I have experienced being "in the zone" in which my body, mind, focus, and performance are perfectly in tune.	1	2	3	4	5	6	7
7. I respect my body's physical limits.	1	2	3	4	5	6	7
8. I am aware of my body's physical limits.	1	2	3	4	5	6	7
9. I feel that my body is able to respond to physical challenges.	1	2	3	4	5	6	7
10. Meeting physical challenges gives me a clear sense of accomplishment.	1	2	3	4	5	6	7
11. I can trust my body to learn new physical skills.	1	2	3	4	5	6	7
12. I feel that demanding physical activity helps me relieve my stress.	1	2	3	4	5	6	7
13. I have a deep connection with my body, one that makes me feel powerful and effective.	1	2	3	4	5	6	7
14. I have learned the importance of taking good care of my body.	1	2	3	4	5	6	7

15.	I have put in a lot of work to make my body healthy and strong.	1	2	3	4	5	6	7
16.	I have developed a connection between my body, my mind, and myself.	1	2	3	4	5	6	7
17.	I trust that my mind and body will work together to help me perform at my best.	1	2	3	4	5	6	7
18.	I feel that demanding physical activity leaves me feeling energized and invigorated each day.	1	2	3	4	5	6	7
19.	I listen to what my body needs in terms of food, rest, and recovery.	1	2	3	4	5	6	7
20.	I enjoy using my body to explore new skills.	1	2	3	4	5	6	7
21.	I feel that if I take care of my body, it will come through for me when I need it to.	1	2	3	4	5	6	7
22.	I have a good sense of what my body can do and be for me, even with its imperfections.	1	2	3	4	5	6	7
23.	I can count on my body to be prepared when it comes to meeting life's challenges.	1	2	3	4	5	6	7
24.	I feel good inside of my body.	1	2	3	4	5	6	7
25.	I am able to voice what things feel right and wrong for me and my body.	1	2	3	4	5	6	7
26.	I feel a "rush" or "click" of excitement from mastering new physical skills.	1	2	3	4	5	6	7
27.	I value my looks or what size clothing I wear more than my strength, stamina, or physical skill.	1	2	3	4	5	6	7
28.	My body makes me feel empowered. .	1	2	3	4	5	6	7
29.	I am able to respond effectively to my body's needs.	1	2	3	4	5	6	7
30.	I get a sense of accomplishment from my physical achievements.	1	2	3	4	5	6	7
31.	I think more about what my body can do rather than how my body looks.	1	2	3	4	5	6	7

Appendix B: (Continued)

32.	I feel uncomfortable pushing my body's physical limits.	1 2 3 4 5 6 7
33.	I notice the strength of my body throughout many of my daily activities.	1 2 3 4 5 6 7
34.	I feel a connection between my physical energy level and the clarity of my thoughts.	1 2 3 4 5 6 7
35.	I feel that I can trust my body to perform for me when I need it to.	1 2 3 4 5 6 7
36.	I feel that I can trust my body to handle physical challenges in life.	1 2 3 4 5 6 7

Appendix C: Body Appreciation Questionnaire (Avalos, Tylka, & Wood-Barcalow, 2005)

For the following questions, please think about how often the following statements best apply to you.

		Never	Seldom	Some-times	Often	Always
1.	I respect my body.	1	2	3	4	5
2.	I feel good about my body.	1	2	3	4	5
3.	On the whole, I am satisfied with my body.	1	2	3	4	5
4.	Despite its flaws, I accept my body for what it is.	1	2	3	4	5
5.	I feel that my body has at least some good qualities.	1	2	3	4	5
6.	I take a positive attitude towards my body.	1	2	3	4	5
7.	I am attentive to my body's needs.	1	2	3	4	5
8.	My self-worth is independent of my body shape or weight.	1	2	3	4	5
9.	I do not focus a lot of energy being concerned with my body shape or weight.	1	2	3	4	5
10.	My feelings toward my body are positive, for the most part.	1	2	3	4	5
11.	I engage in healthy behaviours to take care of my body.	1	2	3	4	5
12.	I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body.	1	2	3	4	5
13.	Despite its imperfections, I still like my body.	1	2	3	4	5

Appendix D: Objectified Body Consciousness Scale (McKinley & Hyde, 1996)

For the following statements, please think about how you feel about yourself and your body and rate to what extent you agree or disagree with each item. You may also select N/A (*does not apply*) if the item does not apply to you.

		Strongly Disagree					**Strongly Agree**		
1.	I rarely think about how I look.	1	2	3	4	5	6	7	N/A
2.	I think it is more important that my clothes are comfortable than whether they look good on me.	1	2	3	4	5	6	7	N/A
3.	I think more about how my body feels than how my body looks.	1	2	3	4	5	6	7	N/A
4.	I rarely compare how I look with how other people look.	1	2	3	4	5	6	7	N/A
5.	During the day, I think about how I look many times.	1	2	3	4	5	6	7	N/A
6.	I often worry about whether the clothes I am wearing make me look good.	1	2	3	4	5	6	7	N/A
7.	I rarely worry about how I look to other people.	1	2	3	4	5	6	7	N/A
8.	I am more concerned with what my body can do than how it looks.	1	2	3	4	5	6	7	N/A
9.	When I can't control my weight, I feel like something must be wrong with me.	1	2	3	4	5	6	7	N/A
10.	I feel ashamed of myself when I haven't made the effort to look my best.	1	2	3	4	5	6	7	N/A
11.	I feel like I must be a bad person when I don't look as good as I could.	1	2	3	4	5	6	7	N/A
12.	I would be ashamed for people to know what I really weigh.	1	2	3	4	5	6	7	N/A
13.	I never worry that something is wrong with me when I am not exercising as much as I should.	1	2	3	4	5	6	7	N/A

14. When I'm not exercising enough, I question   1   2   3   4   5   6   7   N/A
whether I am a good person.

15. Even when I can't control my weight, I   1   2   3   4   5   6   7   N/A
think I'm an okay person.

16. When I'm not the size I think I should be, I   1   2   3   4   5   6   7   N/A
feel ashamed.

Appendix E: Multidimensional Body-Self Relations Questionnaire – Appearance
Evaluation Subscale (Cash, 1997)

Instructions: Using the scale below, please circle the number that best matches your
agreement with the following statements.

Definitely disagree 1	Mostly Disagree 2	Neither agree nor disagree 3	Mostly Agree 4	Definitely Agree 5

1.	My body is sexually appealing.	1	2	3	4	5
2.	I like my looks just the way they are.	1	2	3	4	5
3.	Most people would consider me good looking.	1	2	3	4	5
4.	I like the way I look without my clothes.	1	2	3	4	5
5.	I like the way my clothes fit me.	1	2	3	4	5
6.	I dislike my physique.	1	2	3	4	5
7.	I'm physically unattractive.	1	2	3	4	5

Appendix F: Body Awareness Questionnaire (Shields, Mallory, & Simon, 1989)

For the following statements, please indicate on a scale from 1 (*not at all true of me*) to 7 (*very true of me*) how each item applies to you.

	Not at all true of me					**Always true of me**	
1. I notice differences in the way my body reacts to various foods.	1	2	3	4	5	6	7
2. I can always tell when I bump myself whether or not it will become a bruise.	1	2	3	4	5	6	7
3. I always know when I've exerted myself to the point where I'll be sore the next day.	1	2	3	4	5	6	7
4. I am always aware of changes in my energy level when I eat certain foods.	1	2	3	4	5	6	7
5. I know in advance when I'm getting the flu.	1	2	3	4	5	6	7
6. I know I'm running a fever without taking my temperature.	1	2	3	4	5	6	7
7. I can distinguish between tiredness because of hunger and tiredness because of lack of sleep.	1	2	3	4	5	6	7
8. I can accurately predict what time of day lack of sleep with catch up with me.	1	2	3	4	5	6	7
9. I am aware of a cycle in my activity level throughout the day.	1	2	3	4	5	6	7
10. I don't notice seasonal rhythms and cycles in the way my body functions.	1	2	3	4	5	6	7
11. As soon as I wake up in the morning I know how much energy I'll have during the day.	1	2	3	4	5	6	7
12. I can tell when I go to bed how well I will sleep that night.	1	2	3	4	5	6	7
13. I notice distinct body reactions when I am fatigued.	1	2	3	4	5	6	7
14. I notice specific body responses to changes in the weather.	1	2	3	4	5	6	7

15. I can predict how much sleep I will need at night in order to wake up refreshed.	1	2	3	4	5	6	7
16. When my exercise habits change, I can predict very accurately how that will affect my energy level.	1	2	3	4	5	6	7
17. There seems to be a "best" time for me to go to sleep at night.	1	2	3	4	5	6	7
18. I notice specific bodily reactions to being over-hungry.	1	2	3	4	5	6	7

Appendix G: Body Responsiveness Scale (Daubenmier, 2005)

For the following items, please consider how true each statement is of you and your body on a scale from 1 (*not at all true of me*) to 7 (*always true of me*).

		Not at all true of me					**Always true of me**	
1.	I am confident that my body will let me know what is good for me.	1	2	3	4	5	6	7
2.	My bodily desires lead me to do things that I end up regretting.	1	2	3	4	5	6	7
3.	My mind and body often want to do two different things.	1	2	3	4	5	6	7
4.	I suppress my bodily feelings and sensations.	1	2	3	4	5	6	7
5.	I 'listen' to my body to advise me about what to do.	1	2	3	4	5	6	7
6.	It is important for me to know how my body is feeling throughout the day.	1	2	3	4	5	6	7
7.	I enjoy becoming aware of how my body feels.	1	2	3	4	5	6	7

Appendix H: Eating Disorder Examination – Questionnaire (Fairburn & Beglin, 1994)

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each questions carefully. Please answer all of the questions.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days…	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. Have you been deliberately *trying* to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3. Have you *tried* to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4. Have you *tried* to follow definite rules regarding your eating (e.g., a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5. Have you had a definite desire to have an *empty* stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6. Have you had a definite desire to have a *totally flat* stomach?	0	1	2	3	4	5	6

Appendix H: (Continued)

7. Has thinking about *food, eating, or calories* made it very difficult to concentrate on things you are interested in (e.g., working, following a conversation, or reading)?　　0　1　2　3　4　5　6

8. Has thinking about *shape or weight* made it very difficult to concentrate on things you are interested in (e.g., working, following a conversation, or reading)?　　0　1　2　3　4　5　6

9. Have you had a definite fear of losing control over eating?　　0　1　2　3　4　5　6

10. Have you had a definite fear that you might gain weight?　　0　1　2　3　4　5　6

11. Have you felt fat?　　0　1　2　3　4　5　6

12. Have you had a strong desire to lose weight?　　0　1　2　3　4　5　6

Questions 13 – 18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days)…

13. How many *times* have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?

14. On how many of these times did you have a sense of having lost control over your eating (at the time you were eating)?

15. How many DAYS have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food *and* have had a sense of loss of control at the time)?

16. How many *times* have you made yourself sick (vomit) as a means of controlling your shape or weight?

17. How many *times* have you taken laxatives as a means of controlling your shape or weight?

18. How many *times* have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?

_____

Questions 19 – 21: Please circle the appropriate number. *Please note that for these questions, the term "binge eating" means* eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19. Over the past 28 days, on how many days have you eaten in secret (i.e., furtively)?	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
…Do not count episodes of binge eating.	0	1	2	3	4	5	6

20. On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight?	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the times	Every time
…Do not count episodes of binge eating.	0	1	2	3	4	5	6

21. Over the past 28 days, how concerned have you been about other people seeing you eat?	Not at all		Slightly		Moderately		Markedly
…Do not count episodes of binge eating.	0	1	2	3	4		5

Questions 22 – 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days…	Not at all		Slightly		Moderately		Markedly
22. Has your weight influence how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23. Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6

24. How much would it have upset you if
you had been asked to weigh yourself
once a week (no more, or less, often)   0   1   2   3   4   5   6
for the next four weeks?

25. How dissatisfied have you been with
your weight?   0   1   2   3   4   5   6

26. How dissatisfied have you been with
your shape?   0   1   2   3   4   5   6

27. How uncomfortable have you felt
seeing your body (e.g., seeing your
shape in the mirror, in a shop window   0   1   2   3   4   5   6
reflection, while undressing or taking
a bath or shower)?

28. How uncomfortable have you felt
about others seeing your shape or
figure (e.g., in communal changing   0   1   2   3   4   5   6
rooms, when swimming, or wearing
tight clothes)?

What is your weight at present? (Please give your best estimate)

_____

What is your height? (Please give your best estimate)

_____

If female: Over the past three to four months, have you missed any
menstrual periods?

_____

  • If so, how many?

_____

  • Have you been taking the "pill"?

_____

Appendix I: Rosenberg Self Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.*	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.*	I feel I do not have much to be proud of.	SA	A	D	SD
6.*	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.*	I wish I could have more respect for myself.	SA	A	D	SD
9.*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

Appendix J: The Marlowe-Crowne Social Desirability Scale - Personal Reaction Inventory (Crowne & Marlowe, 1960)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates. (T)

2. I never hesitate to go out of my way to help someone in trouble. (T)

3. It is sometimes hard for me to go on with my work if I am not encouraged. (F)

4. I have never intensely disliked anyone. (T)

5. On occasion I have had doubts about my ability to succeed in life. (F)

6. I sometimes feel resentful when I don't get my way. (F)

7. I am always careful about my manner of dress. (T)

8. My table manners at home are as good as when I eat out in a restaurant. (T)

9. If I could get into a movie without paying and be sure I was not seen I would probably do it. (F)

10. On a few occasions, I have given up doing something because I thought too little of my ability. (F)

11. I like to gossip at times. (F)

12. There have been times when I felt like rebelling against people in authority even though I knew they were right. (F) ,

13. No matter who I'm talking to, I'm always a good listener. (T)

14. I can remember "playing sick" to get out of something. (F)

15. There have been occasions when I took advantage of someone. (F)

16. I'm always willing to admit it when I make a mistake. (T)

17. I always try to practice what I preach. (T)

18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. (T)

19. I sometimes try to get even rather than forgive and forget. (F)

20. When I don't know something I don't at all mind admitting it. (T)

21. I am always courteous, even to people who are disagreeable. (T)

22. At times I have really insisted ori having things my own way. (F)

23. There have been occasions when I felt like smashing things. (F)

24. I would never think of letting someone else be punished for my wrongdoings.(T)

25. I never resent being asked to return a favor. (T)

26. I have never been irked when people expressed ideas very different from my own. (T)

27. I never make a long trip without checking the safety of my car. (T)

28. There have been times when I was quite jealous of the good fortune of others. (F)

29. I have almost never felt the urge to tell someone off. (T)

30. I am sometimes irritated by people who ask favors of me. (F)

31. I have never felt that I was punished without cause. (T)

32. I sometimes think when people have a mistortune they only got what they deserved. (F)

33. I have never deliberately said something that hurt someone's feelings.(T)