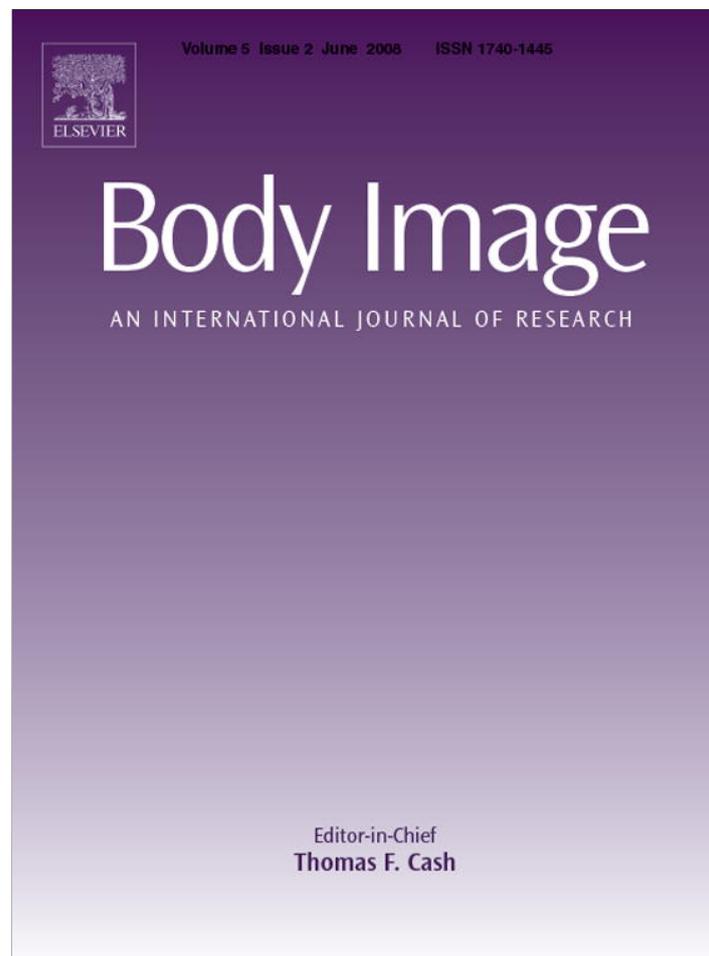


Provided for non-commercial research and education use.  
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

Body Image 5 (2008) 164–172

---



---

# Body Image

---



---

[www.elsevier.com/locate/bodyimage](http://www.elsevier.com/locate/bodyimage)

## The effects of physique-salient and physique non-salient exercise videos on women's body image, self-presentational concerns, and exercise motivation

Kathleen A. Martin Ginis<sup>a,\*</sup>, Harry Prapavessis<sup>b</sup>, Anne M. Haase<sup>c</sup><sup>a</sup> *McMaster University, Department of Kinesiology, Hamilton, ON L8S 4K1, Canada*<sup>b</sup> *University of Western Ontario, School of Kinesiology, London, ON N6A 3K7, UK*<sup>c</sup> *University of Bristol, Department of Exercise, Nutrition and Health Sciences, Bristol BS8 1TH, UK*

Received 6 August 2007; received in revised form 28 November 2007; accepted 28 November 2007

---

### Abstract

This experiment examined the effects of exposure to physique-salient (PS) and physique non-salient (PNS) exercise videos and the moderating influence of perceived physique discrepancies, on body image, self-presentational concerns, and exercise motivation. Eighty inactive women ( $M$  age = 26) exercised to a 30 min instructional exercise video. In the PS condition, the video instructor wore revealing attire that emphasized her thin and toned physique. In the PNS condition, she wore attire that concealed her physique. Participants completed pre- and post-exercise measures of body image, social physique anxiety (SPA) and self-presentational efficacy (SPE) and a post-exercise measure of exercise motivation and perceived discrepancies with the instructor's body. No main or moderated effects emerged for video condition. However, greater perceived negative discrepancies were associated with poorer post-exercise body satisfaction and body evaluations, and higher state SPA. There were no effects on SPE or motivation. Results suggest that exercise videos that elicit perceived negative discrepancies can be detrimental to women's body images.

© 2007 Elsevier Ltd. All rights reserved.

*Keywords:* Physical activity; Media images; Social physique anxiety; Social comparison; Exercise motivation

---

### Introduction

In westernized societies, the female cultural body image ideal is that of a very thin and toned physique. The media is the primary, and most aggressive distributor of this narrowly defined body standard, with the vast majority of female bodies shown in television and print representing this ideal (Spitzer, Henderson, & Zivian, 1999). Given such a ubiquitous, albeit impossible standard, it is not surprising that women's self-perceptions become more negative after

exposure to media content emphasizing thin, toned bodies. A meta-analytic review of the acute effects of experimental exposure to such media images concluded that they had a small, but consistent negative effect on female body image (Groesz, Levine, & Murnen, 2002). For example, studies have shown that after brief exposures to televised images of idealized models, women report greater body dissatisfaction (Tiggemann & Slater, 2004), weight dissatisfaction, anger, anxiety, depression (Cattarin, Thompson, Thomas, & Williams, 2000; Heinberg & Thompson, 1995), and weight preoccupation (Posavac, Posavac, & Weigel, 2001).

Social comparison processes have been implicated as the mechanism underlying the negative effects of media exposure. According to social comparison theory

\* Tel.: +1 905 525 9140x23574.

E-mail address: [martink@mcmaster.ca](mailto:martink@mcmaster.ca) (K.A. Martin Ginis).

(Festinger, 1954), humans have an innate drive to evaluate characteristics of themselves, a drive that is often accomplished by comparing oneself with others. Comparisons with people who are superior to oneself on an attribute of interest (e.g., physical attractiveness) are known as *upward comparisons*, and are often associated with increases in emotional distress and decreases in self-esteem. In contrast, comparisons with people who are inferior to oneself are considered *downward comparisons*, and may be associated with increases in positive affect and self-esteem (Major, Testa, & Bylsma, 1991).

Social comparisons, particularly upward comparisons, have been implicated as the process by which media images influence body image and other self-perceptions (Cattarin et al., 2000; Posavac et al., 2001; Tiggemann & McGill, 2004). Specifically, televised models elicit social comparisons in women (Tiggemann & Slater, 2004) such that women evaluate their own physical attractiveness by comparing themselves with the models. But because these comparisons are typically made with a highly attractive model that epitomizes the cultural beauty ideal, for most women, the comparisons are upward and produce a perceived negative discrepancy between one's own attractiveness and the media standard of attractiveness. These discrepancies are believed to trigger self-denigration and concomitant negative thoughts and feelings about oneself and one's body (Posavac et al.).

Instructional exercise videos typically feature supermodels, actresses, and other women with exceptionally thin and toned bodies, dressed in attire that emphasizes their physiques (Markula, 1995). Although exercise video producers probably emphasize thin and toned physiques for motivational purposes (i.e., to show women what, ostensibly, they could achieve if they exercise diligently; Fleming & Martin Ginis, 2004), it seems that women do not like this approach. They find the typical exercise video instructor difficult to relate to (Markula), and intimidating (Maguire & Mansfield, 1998). Furthermore, in studies where women have been shown a video of an exercise class, the physique saliency of the exercisers and instructors has been shown to affect women's thoughts and feelings about themselves as well as about the exercise class, particularly for women who exercise at low to moderate frequencies (Crawford & Eklund, 1994; Eklund & Crawford, 1994; Sinden, Martin Ginis, & Angove, 2003).

For example, in one study (Crawford & Eklund, 1994), moderately active women watched a video of an aerobics class in which the instructor and class members

wore physique-salient attire (tights and thong leotards) and another video in which they wore non-salient attire (shorts and t-shirts). Participants expressed a clear preference for the physique non-salient class. When this study was replicated with a sample of older women (Sinden et al., 2003), women who were less physically active felt more negatively towards the physique-salient class than women who were more active. In addition, a subset of women experienced a significant decrease in self-presentational efficacy (i.e., confidence in one's ability to self-present as a fit and competent exerciser; Gammage, Hall, & Martin Ginis, 2004) after viewing the physique-salient class. These findings parallel reports that exercising with women dressed in revealing attire makes women feel intimidated and less confident in their own bodies (Frederick & Shaw, 1995).

Considering the media exposure literature and exercise attire studies together, it seems reasonable to suggest that exposure to instructional exercise videos, in which an instructor's thin and toned physique is emphasized or made salient, could evoke body dissatisfaction and be de-motivating with respect to future exercise participation. Only one published study has examined this possibility (Fleming & Martin Ginis, 2004). Young women who watched a 4-min edited sequence of instructional exercise videos featuring exercise instructors with thin, toned bodies, dressed in revealing exercise attire, reported lower self-presentational efficacy for exercise than women who watched video clips featuring instructors with a range of body types and who were more modestly attired. Lower self-presentational efficacy was, in turn, associated with less motivation to exercise in the future. The authors concluded that exposure to the physiques of "ideal-looking" exercise models can have deleterious effects on women's self-presentational cognitions. This is an important finding given that self-presentational concerns can be a significant barrier to exercise participation (Martin, Leary, & O'Brien, 2001).

There were, however, a few limitations to this study. First, the authors suggested that perceived negative discrepancies between the self and the exercise models accounted for lower efficacy in the ideal-looking model condition. However, perceived discrepancies were not assessed. Second, because the experimental stimuli consisted of commercially purchased exercise videos, factors such as the amount of time cameras focused on individual body parts (e.g., breasts, thighs), the instructor's skill level, and the difficulty of the exercises could not be controlled across the stimuli conditions. The authors conceded that these other variables could account for differential responses to the two sets of

video stimuli. And finally, because study participants passively watched the videos, the findings could not be generalized to situations where women actually exercise with the videos. When exercising, women might pay more attention to following the instructor's moves than perceived discrepancies with the instructor's physique. The present experiment was designed to address these limitations.

Specifically, our purpose was to compare women's responses to exercise with a physique-salient and a physique non-salient exercise instructional video, and the moderating effects of perceived discrepancies with the instructor's physique. A key methodological innovation was the creation of two exercise videos. The physique-salient video featured an instructor dressed in revealing exercise attire that emphasized her thin and toned physique. The physique non-salient video featured the same instructor, but wearing attire that de-emphasized her physique. Apart from the instructor's attire, the two videos were identical.

It was hypothesized that overall, women who exercised with the physique-salient video would report poorer body image, lower self-presentational efficacy, and greater social physique anxiety than women who exercised with the physique non-salient video. Because lower self-presentational efficacy is associated with poorer exercise motivation (Fleming & Martin Ginis, 2004; Gammage et al., 2004), women in the physique-salient video condition were also expected to be less motivated to exercise in the future. In addition, it was hypothesized that perceived negative discrepancies would moderate these effects;

a larger perceived negative discrepancy between the physical attractiveness of one's own body and the physique-salient video instructor's body would be associated with poorer body image, self-presentational efficacy and exercise motivation, and greater social physique anxiety.

**Method**

*Sample size, eligibility criteria, and recruitment*

Sample size was estimated using Power & Precision software (v. 2.0.44) for a five-variable multiple regression model (see Table 1). Using Cohen's (1988) conventions for small, medium, and large effect sizes in a regression model, a large main effect for video condition was anticipated, paralleling the large effects we found for exercise video exposure on self-presentational efficacy (Fleming & Martin Ginis, 2004). Given the difficulty of detecting interactions (cf. McClelland & Judd, 1993), a small effect was anticipated for the video condition × perceived discrepancy interaction. It was estimated that 75 participants were needed to have 80% power to detect a significant interaction.

Inclusion criteria were: (a) female, (b) ages of 20–45, (c) engaged in ≤2 bouts of moderate or strenuous physical activity/week over the past 6 months as determined by the Leisure-Time Exercise Questionnaire (LTEQ; Godin & Shephard, 1985), and (d) no orthopedic, cardiac, or respiratory limitations. The study was restricted to inactive women in order to control for any potential moderating effects that

Table 1  
Hierarchical regression models predicting the self-presentation and body image measures

		Social physique anxiety			Self-presentational efficacy			Body areas satisfaction			Appearance evaluation		
		Adj R <sup>2</sup>	β	t	Adj R <sup>2</sup>	β	t	Adj R <sup>2</sup>	β	t	Adj R <sup>2</sup>	β	t
Step 1	Pre-test measure	.33	.51	4.98**	.79	.86	15.00**	.76	.90	14.20**	.83	.93	17.11**
	BMI		.16	1.56		-.07	1.15		.04	.65		.03	.57
Step 2	Pre-test measure	.36	.39	3.49**	.80	.82	13.63**	.77	.84	12.08**	.84	.86	14.20**
	BMI		.10	.95		-.07	1.17		.07	1.00		.04	.74
	Discrepancy Video		-.24	2.13*		.07	1.06		.13	1.99*		.13	2.21*
			.02	.22		-.09	1.64		-.03	.74		-.05	1.13
Step 3	Pre-test measure	.35	.39	3.43**	.80	.83	13.32**	.77	.84	12.04**	.84	.86	14.71**
	BMI		.09	.84		-.07	1.04		.06	.88		.05	.80
	Discrepancy Video		-.43	1.34		.17	.94		.03	.14		.20	1.27
	Discrepancy × video		.19	.62		-.10	.61		.11	.61		-.08	.50

\* p ≤ .05.

\*\* p ≤ .001.

exercise experience might have on the manipulation, as well as potential ceiling effects and low variability in the measure of exercise motivation if the sample was comprised of habitual exercisers. An incentive of \$15 was offered to those who completed the two experimental sessions. The protocol was approved by research ethics boards at the investigators' universities.

### Participants

Participants were recruited from university campuses and surrounding communities in a large city in New Zealand. One hundred and thirteen women expressed interest in the study and were screened for eligibility; 87 were eligible and scheduled to participate. Excluded volunteers were either too active ( $n = 25$ ) or too young ( $n = 1$ ). Before Session 1, four women dropped out and did not reschedule, and three dropped out before Session 2.

The final sample consisted of 80 women ( $M$  age = 26.4 years,  $SD = 7.4$ ) who completed both experimental sessions. Mean body mass index for the sample was  $22.1 \text{ kg/m}^2$  ( $SD = 3.3$ ). Participants were generally inactive, reporting an average of 1.9 mild intensity ( $SD = 2.5$ ), .7 moderate intensity ( $SD = 1.1$ ) and .9 heavy intensity ( $SD = 1.3$ ) bouts of activity per week. Overall, the sample was well-educated with 92% having some post-secondary education and the remainder having completed secondary school. The sample was ethnically diverse (44% White, 49% Asian [Southern, Eastern, Southeastern], and 7% Maori or Pacific Islander).

### Measures

*Social Physique Anxiety Scale-Trait Version* (SPAS; Hart, Leary, & Rejeski, 1989). Social physique anxiety reflects the extent to which people feel anxious when others observe or evaluate their bodies (Hart et al., 1989). These tendencies were measured by the 9-item version of the SPAS (Martin, Rejeski, Leary, McAuley, & Bane, 1997). Participants indicated the degree to which each item was characteristic of them (e.g., "It would make me uncomfortable to know others were evaluating my physique/figure") on a scale ranging from 1 (*not at all characteristic*) to 5 (*extremely characteristic*). Items were scored and summed such that higher scores indicated greater social physique anxiety. The 9-item SPAS has demonstrated good construct validity and consistently high internal consistency reliability (for a review, see Martin Ginis,

Lindwall, & Prapavessis, 2007). Reliability in the present study was  $\alpha = .84$ .

*Social Physique Anxiety Scale-State Version*. Measures of social physique anxiety that are specific to exercise situations, or that assess physique anxiety as a state variable, may be more sensitive to exercise manipulations than the generic SPAS (Martin Ginis et al., 2007). As such, we asked participants to imagine that they were in a real-life exercise class with the aerobics instructor observed in the video and to indicate how well each SPAS item described how they would feel in that situation. Eight of the original SPAS items were reworded to measure the effects of the exercise video on women's acute feelings of social physique anxiety (e.g., "I would be comfortable with how fit my body appears to others," and "Unattractive features of my physique/figure would make me nervous") The 9th item, which queries physique anxiety associated with wearing a bathing suit, was rewritten as "Sitting here in my workout clothes, I feel nervous about the shape of my body." A scenario approach was necessary to assess state social physique anxiety because the SPAS items assess anxiety regarding others' evaluations of one's body. Given that women were not actually with other exercisers or the instructor, it was necessary to ask them to imagine this situation. A state version of the SPAS, identical to the one used in the present study except for the instructional set, has proven valid and reliable in a scenario study (Kruisselbrink, Dodge, Swanburg, & MacLeod, 2004), has demonstrated construct validity in terms of its correlations with theoretically related constructs such as body image states and has proven to be sensitive to manipulations of exercise environments (Murru, Martin Ginis, & Strong, 2007). Reliability in the present study was  $\alpha = .84$ .

*Multidimensional Body-Self Relations Questionnaire* (MBSRQ; Cash, 2000). This 69-item, 10-subscale inventory assesses cognitive and attitudinal aspects of body image. Because our pilot work (Burgess, 2004; Fleming, 2001) indicated that only two subscales – the Body Areas Satisfaction (BASS) and Appearance Evaluation (AE) scales – were responsive to exercise video manipulations, only the BASS and AE subscales were administered.

The 9-item BASS subscale measures dissatisfaction-satisfaction with nine bodily areas/aspects (e.g., face, upper torso, muscle tone). Participants rated their level of satisfaction using a scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). Scale item scores were averaged and higher scores indicated greater body satisfaction. The 7-item AE subscale

assesses perceptions of physical attractiveness. Participants indicated the extent to which they agreed with each item (e.g., “Most people would consider me good looking”) on a scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*). Scale item scores were averaged and higher scores indicated greater perceived attractiveness. Both the BASS and AE subscales have demonstrated good construct validity and internal consistency (Williams & Cash, 2001). In the present study, pre- and post-test reliabilities were .76 and .79 for BASS and .87 and .88 for AE.

*Self-presentational efficacy* (SPE; Gammage et al., 2004). This 5-item scale assesses confidence in one's abilities to self-present as a fit, competent exerciser. Participants were instructed to “think about yourself exercising in a public setting (e.g., at a gym, a class, outside)” and to then indicate their confidence that other people in the exercise setting who could see them, would think that they had good physical coordination, good stamina, that their body looked fit and toned, that they exercise regularly, and that they are in good shape. Responses were made on a scale ranging from 0 (*not at all confident*) to 100 (*completely confident*) and then scored by averaging responses across the five items. The SPE scale has proven to be construct valid and internally consistent (Fleming & Martin Ginis, 2004; Gammage et al., 2004). Cronbach's alpha was .90 at both pre- and post-testing in the present study.

*Exercise motivation.* Participants were presented with a definition of exercise (“Exercise is planned physical activity that you do to improve your mental or physical well-being”) and asked to indicate their intentions to exercise over the next 7 days by responding to three items that have been frequently used to assess exercise goal intentions (e.g., “I intend to do at least 30 min of moderate to vigorous exercise on most days next week”). These items reflect Ajzen's (1988) conceptualization and operationalization of intention as a measure of motivation. Responses were made on 7-point scales (e.g., 1 = *definitely false*; 7 = *definitely true*) and were summed such that higher scores indicated stronger motivation to exercise. Internal consistency reliability for these items in the present study was  $\alpha = .85$ .

*Perceived discrepancies.* Participants rated how similar they were to the instructor in terms of their body's physical attractiveness. This item was embedded in a set of five other items that asked participants to rate how similar they were to the instructor in terms of age, physical fitness, physical

strength, level of coordination, and skill at doing aerobics. For each attribute, respondents indicated if they were much less, somewhat less, just as, somewhat more, or much more [fit, strong, etc.] than the instructor. Responses were subsequently scored as  $-2, -1, 0, +1$  and  $+2$ , respectively.

*Check of equivalency of video conditions.* Participants wore a heart rate monitor (Proform AccuRate PT9, Polar USA) to confirm that women in both video conditions exercised at similar levels of intensity. To ensure that the two exercise videos were perceived as equally challenging and enjoyable, participants used 7-point scales to rate the difficulty of the exercise session (1 = *not all difficult*; 7 = *extremely difficult*) and whether it was enjoyable (1 = *not at all*; 7 = *extremely*). To ensure that the instructor had been perceived as equally competent across the two video conditions, participants completed a modified version of the instructional-motivational subscale of the Proxy Efficacy for Exercise Questionnaire (Bray, Gyurcsik, Martin Ginis, & Culos-Reed, 2004). The items had good internal consistency ( $\alpha = .92$ ).

#### *Exercise video stimuli*

The exercise video instructor was an experienced fitness class leader and a world-class distance runner. She was considered an ideal model for the videos given her competence as an instructor and her lean, toned appearance, reflective of the female cultural body image ideal (Gruber, 2007; Markula, 1995). In the physique-salient video condition, the instructor wore physique-emphasizing attire—a fitted lycra tank top and lycra shorts that covered just the very tops of her thighs. In the physique non-salient condition, our objective was to de-emphasize the instructor's physique. She wore a baggy, long-sleeved jersey that covered her from mid-neck to her hips along with baggy, shapeless trousers that fell to her ankles.

The videos were professionally filmed and edited in a television studio. Three stationary cameras were used during filming so that viewers could observe the instructor from three different angles. Only whole-body shots were used (i.e., no close-ups). Each video was 30 min in duration. The exercise video routine consisted of a 5 min warm-up, 15 min of basic aerobic dance and boxing moves, 3 min of leg strengthening exercises, a 2 min break to get a drink of water and an exercise mat, and 5 min of stretching. The instructor performed the same routine and used the same verbal, scripted instructions in each video.

## Procedure

Researchers have been criticized for not measuring dispositional body image concerns before measuring the effects of exposure to media images (Groesz et al., 2002). To maximize the methodological rigor of our experiment, two separate testing sessions were conducted approximately 1 week apart. At *Session 1 (baseline testing)*, dispositional measures of body image were administered (the trait SPAS, AE, BASS, and SPE scales) along with a demographics questionnaire. At *Session 2*, the *experimental manipulation* occurred. Participants were randomly assigned to one of the two video conditions. Upon arrival at the lab, the participant was fitted with a heart rate monitor and directed to the center of the room, directly in front of the video display. She was told that the video was 30-min duration, and to follow the instructions on the exercise video, but to work at her own pace and not over-exert. Water and an exercise mat were provided. The research assistant waited outside of the lab while the participant exercised. When the video ended, the participant was instructed to rest for 5 min. She was then administered the state SPAS, AE, BASS, SPE, and exercise motivation measures, along with the perceived discrepancy items, the equivalency checks and finally, two items assessing self-reported height and weight. Next, the participant removed the heart rate monitor, was debriefed, and paid \$15.

## Results

### Equivalency of video conditions

*t*-tests indicated no differences in ratings of difficulty ( $M_{\text{salient}} = 2.9 \pm 1.5$ ,  $M_{\text{non-salient}} = 3.3 \pm 1.5$ ), enjoyment ( $M_{\text{salient}} = 4.9 \pm 1.3$ ,  $M_{\text{non-salient}} = 5.2 \pm 1.1$ ), instructor competence ( $M_{\text{salient}} = 71.8 \pm 16.9$ ,  $M_{\text{non-salient}} = 72.2 \pm 13.7$ ), or heart rate threshold (% of time participants spent in activity  $\geq 140$  b/min;  $M_{\text{salient}} = 21.77 \pm 19.40$ ,

$M_{\text{non-salient}} = 17.05 \pm 13.08$ ) across the two video conditions (all  $ps > .20$ ).

### Perceived discrepancies

There were no significant between-conditions differences for any of the perceived discrepancy items (all  $ps > .09$ ). With regard to physique attractiveness, overall, women in both conditions thought that their bodies were “somewhat less attractive” than the instructor’s body ( $M_{\text{salient}} = -.9 \pm -.8$ ,  $M_{\text{non-salient}} = -.8 \pm -.9$ ,  $p = .41$ ).

### Hypothesis tests

The hypotheses were tested using a series of moderated regression analyses. To analyze the self-presentational and body images measures, separate hierarchical regression models were computed whereby the pre-experimental measure was entered on the first step of the model along with body mass index ( $\text{kg}/\text{m}^2$ ). The main effects for video condition and perceived discrepancies were entered on the second step, and the video condition by perceived discrepancy interaction was entered on the third step. To analyze the exercise motivation measure, the main effects for video condition and perceived discrepancies were entered on the first step of the model, and the video condition by perceived discrepancy interaction was entered on the second step. The perceived discrepancy variable was centered (Aiken & West, 1991) prior to entering its main effect, and calculating and entering the interaction term.

The results of the regression analyses for the self-presentational and body image measures are presented in Table 1. Contrary to hypothesis, the main effect for video condition was not significant in any of the models, indicating that there was no difference in state social physique anxiety, self-presentational efficacy, body areas satisfaction or appearance evaluation across the two video conditions (see Table 2). Also contrary to

Table 2  
Adjusted<sup>a</sup> means and standard errors for the post-exercise measures across video conditions

Post-exercise measure	Video condition		Possible scoring range
	Physique-salient ( $n = 41$ )	Physique non-salient ( $n = 39$ )	
Social physique anxiety	22.03 (.80)	21.74 (.83)	9–45
Self-presentational efficacy	53.83 (1.47)	51.26 (1.50)	0–100
Body areas satisfaction	3.27 (.05)	3.22 (.05)	1–9
Appearance evaluation	3.48 (.05)	3.39 (.05)	1–5
Exercise motivation	12.10 (.78)	12.54 (.80)	3–21

<sup>a</sup> All variables are adjusted for the baseline measure of that variable except for exercise motivation.

hypothesis, the video condition by perceived discrepancy interaction was not significant in any of the models.

There was, however, an unexpected main effect for perceived discrepancy. Prior to entering the interaction term into the regression models,<sup>1</sup> the main effect for perceived discrepancy was a significant predictor of post-experimental social physique anxiety ( $\beta = -.27$ ,  $p = .01$ ), appearance evaluation ( $\beta = .12$ ,  $p = .04$ ), and body areas satisfaction ( $\beta = .13$ ,  $p = .05$ ). These results indicate that regardless of their video condition, women who perceived greater negative discrepancies with the instructor's physique reported higher levels of social physique anxiety, poorer evaluations of their own physical appearance and lower body satisfaction.

With regard to exercise motivation, neither the main effects nor the interaction effect were significant predictors of post-experimental exercise intentions (all  $ps > .58$ ).

## Discussion

The purpose of this experiment was to compare women's psychological responses to exercise with a physique-salient versus a physique non-salient video instructor. Contrary to our hypotheses, there were no post-exercise differences in the body image or self-presentational measures, and perceived physique discrepancies did not moderate the effects of the videos. However, the main effect for perceived discrepancies indicated that regardless of which video they saw, women who perceived a greater negative discrepancy with the exercise instructor's body reported poorer perceptions of their own physical attractiveness, greater state social physique anxiety, and greater body dissatisfaction.

The observed effects of perceived negative discrepancies are consistent with social comparison (Festinger, 1954) explanations for the negative effects of media exposure on women's psychological well-being. Our findings add to a growing body of research indicating that self-comparisons with models can prompt negative thoughts and feelings about one's own body (Cattarin et al., 2000; Tiggemann & McGill,

2004; Tiggemann & Slater, 2004). Indeed, considerable research has shown that women experience increased body dissatisfaction and social physique anxiety following exposure to magazine still shots, television commercials and music videos that feature idealized, and salient images of women's bodies (Groesz et al., 2002; Tiggemann & Slater). Our results extend this phenomenon to exercise videos and are particularly poignant because exercise is generally associated with improvements in body image (Martin & Lichtenberger, 2002). In contrast, our findings suggest that the exercise video workout made many women feel worse – not better – about their bodies. One can only imagine the negative impact that commercially produced exercise videos, featuring supermodels and other exceptionally attractive women, might have on women's body images.

Contrary to our hypotheses, we did not find a main or moderated effect of exercise video condition on women's body image. In fact, for the self-presentational and body image measures, the beta weights for the exercise video condition were virtually zero. These null findings speak to the potency of women's perceptions for influencing their responses to the instructor. Based on previous studies comparing women's responses to videotaped exercise classes that differed in terms of physique saliency (Crawford & Eklund, 1994; Eklund & Crawford, 1994; Sinden et al., 2003), we assumed that our participants would be more threatened by the physique-salient instructor and, in turn, they would experience greater body image and self-presentational concerns than women who exercised with a physique non-salient instructor. Yet although the instructor's body was camouflaged with baggy clothing in the physique non-salient condition, the perceived discrepancy data indicated that participants still perceived their bodies to be less attractive than the instructor's body. Perhaps participants assumed that by virtue of being an exercise instructor, the instructor had a very attractive body underneath her baggy clothes. Apparently, *perceptions* of instructor physique are a far more potent determinant of women's psychological responses to an exercise video instructor than the actual portrayal of her physique. Furthermore, although women may express a preference for physique non-salient exercise situations (Crawford & Eklund), our findings suggest that less revealing exercise attire does not necessarily protect women from perceived negative physique discrepancies and concomitant threats to body image.

The absence of a video condition by perceived discrepancy effect could also be attributed to our study design. Although the study was adequately powered to detect a small interaction effect, it was not optimally

<sup>1</sup> As a result of the strong correlation between perceived discrepancy and the interaction term, the variance inflation factor for the interaction term was  $>10.9$  in each model. Given the high degree of multicollinearity between these variables, it was considered appropriate to interpret the standardized beta coefficients and their significance based on the values obtained in the second last step of the model (i.e., prior to entering the interaction term).

designed to detect an interaction (McClelland & Judd, 1993). The optimal design for producing and detecting interactions, is one with extreme group observations to maximize the variance that can be explained by an interaction effect. In the present study, an optimal design would have had participants in four categories: experimental video and high perceived discrepancies, control video and high perceived discrepancies, experimental video and low perceived discrepancies, control video and low perceived discrepancies. However, as none of our participants scored at the extreme low end of the perceived discrepancy scale, we did not have these four extreme groups and our ability to detect an interaction was compromised.

It should also be noted that two of our dependant measures were trait body image measures, which assess the relatively stable aspects of body image. Although it is possible to see effects of brief media exposure on trait body image (Groesz et al., 2002), a state measure of body image—such as the Body Image States Scale (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002)—may have been more sensitive to our manipulation. We chose not to measure state body image immediately before and after the manipulation because we were concerned about the possible bias of expectancy effects on any observed changes. However, in retrospect, a post-test assessment of state body image would have allowed us to examine potential moderating effects of trait body image on situational responses to the exercise video manipulation. This is an idea worthy of further examination.

Contrary to previous findings (Fleming & Martin Ginis, 2004), we did not find an effect of the videos on self-presentational efficacy. One explanation for this null finding may be that in the present study, participants actually performed the exercises whereas participants in the previous study merely watched the exercise videos. Performing the exercises could have served as a form of mastery experience that superceded any vicarious information derived from watching the instructor (Bandura, 1997). A second possibility is that the previously observed effects on self-presentational efficacy were due to differences in the perceived difficulty of the activities portrayed across the two video conditions. This possibility reinforces the need to control for confounding contextual variables (exercise difficulty, choreography, etc.) when examining the effects of exposure to different video models.

Exercise motivation was another variable unaffected by the videos or perceived discrepancies. Overall, exercise motivation was not very strong in this sample. Participants scored around the scale mid-point of the

motivation measure (see Table 2), suggesting that they did not find the videos particularly inspiring. Perhaps multiple exposures are needed to see any effects, positive or negative, on exercise motivation. Nevertheless, we think that it is important for the exercise video industry to heed these null findings. The absence of effects on motivation suggests that women are not necessarily motivated to exercise by an instructor perceived as having a more attractive body than their own.

In summary, our results indicate that the negative effects of exposure to physique-salient television images on women's body images generalize to exercise videos. The results also add to a growing body of literature that identifies social comparison as a mechanism by which acute media exposure induces negative effects (Cattarin et al., 2000; Heinberg & Thompson, 1995; Tiggemann & McGill, 2004; Tiggemann & Slater, 2004). Given these findings, we urge both the people who make exercise videos and the people who use them, to be aware of the potentially detrimental psychological effects of exercise videos. Exercise video producers should be encouraged to feature models with a range of body shapes and sizes to at least minimize perceived physique discrepancies. Exercise video users should be encouraged to avoid making social comparisons with video instructors, as interventions that short-circuit the social comparison process can prevent women from succumbing to the negative consequences of exposure to idealized television models (e.g., Posavac et al., 2001). We believe that by paying more attention to how exercise videos are produced and consumed, women may reap greater physical and mental health benefits from exercise video workouts.

## Acknowledgements

This research was supported by a Planning and Development Grant from the Canadian Institutes of Health Research (CIHR).

We extend our appreciation to Spero Ginis and Stacey Brophy for their assistance with data collection and to Dr. Robert C. Eklund for his thoughtful comments on a previous version of this manuscript.

## References

- Aiken, L., & West, S. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.
- Ajzen, I. (1988). *Attitudes, personality, and behavior*. Milton Keynes, UK: Open University Press.

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bray, S. R., Gyurcsik, N. C., Martin Ginis, K. A., & Culos-Reed, S. N. (2004). The Proxy Efficacy Exercise Questionnaire: Development of an instrument to assess female exercisers' proxy efficacy beliefs in structured group exercise classes. *Journal of Sport & Exercise Psychology*, *26*, 442–456.
- Burgess, J. (2004). *The effects of exercising with physique-salient and physique non-salient yoga videos on women's body image*. Unpublished undergraduate thesis, McMaster University, Hamilton, Ontario, Canada.
- Cash, T. F. (2000). User's manual for the Multidimensional Body-Self Relations Questionnaire. Available from the author at [www.body-images.com](http://www.body-images.com)
- Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders: The Journal of Treatment & Prevention*, *10*, 103–113.
- Cattarin, J. A., Thompson, J. K., Thomas, C., & Williams, R. (2000). Body image, mood, and televised images of attractiveness: The role of social comparison. *Journal of Social and Clinical Psychology*, *19*, 220–239.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Crawford, S., & Eklund, R. C. (1994). Social physique anxiety, reasons for exercise, and attitudes toward exercise settings. *Journal of Sport & Exercise Psychology*, *16*, 70–82.
- Eklund, R. C., & Crawford, S. (1994). Active women, social physique anxiety, and exercise. *Journal of Sport & Exercise Psychology*, *16*, 431–448.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–140.
- Fleming, J. C. (2001). *The effects of physique salient and non-salient exercise videos on women's body image and selected psychosocial variables*. Unpublished master's thesis, McMaster University, Hamilton, Ontario, Canada.
- Fleming, J. C., & Martin Ginis, K. A. (2004). The effects of commercial exercise video models on women's self-presentational efficacy and exercise task self-efficacy. *Journal of Applied Sport Psychology*, *16*, 92–102.
- Frederick, C. J., & Shaw, S. M. (1995). Body image as a leisure constraint: Examining the experience of aerobic exercise classes for young women. *Leisure Sciences*, *17*, 57–73.
- Gammage, K. L., Hall, C. R., & Martin Ginis, K. A. (2004). Self-presentation in exercise contexts: Differences between high and low frequency exercisers. *Journal of Applied Social Psychology*, *34*, 1638–1651.
- Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sports Science*, *10*, 141–146.
- Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, *31*, 1–16.
- Gruber, A. J. (2007). A more muscular female body ideal. In J. K. Thompson & G. Cafri (Eds.), *The muscular ideal. Psychological, social, and medical perspectives* (pp. 217–234). Washington, DC: American Psychological Association.
- Hart, E. A., Leary, M. R., & Rejeski, W. J. (1989). The measurement of social physique anxiety. *Journal of Sport & Exercise Psychology*, *11*, 94–104.
- Heinberg, L. J., & Thompson, J. K. (1995). Body image and televised images of attractiveness: A controlled laboratory investigation. *Journal of Social and Clinical Psychology*, *14*, 325–338.
- Kruisselbrink, L. D., Dodge, A. M., Swanburg, S. L., & MacLeod, A. L. (2004). Influence of same-sex and mixed-sex exercise settings on the social physique anxiety and exercise intentions of males and females. *Journal of Sport & Exercise Psychology*, *26*, 616–622.
- Maguire, J., & Mansfield, L. (1998). “No-body's perfect”: Women, aerobics, and the body beautiful. *Sociology of Sport Journal*, *15*, 109–137.
- Major, B., Testa, M., & Bylsma, W. H. (1991). Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research* (pp. 237–260). Hillsdale, NJ: Erlbaum.
- Markula, P. (1995). Firm but shapely, fit but sexy, strong but thin—the postmodern aerobicizing female bodies. *Sociology of Sport Journal*, *12*, 424–453.
- Martin, K. A., Leary, M. R., & O'Brien, J. (2001). Role of self-presentation in the health practices of a sample of Irish adolescents. *Journal of Adolescent Health*, *28*, 259–262.
- Martin, K. A., & Lichtenberger, C. M. (2002). Fitness enhancement and body image change. In T. F. Cash & T. Pruzinsky (Eds.), *Body images: A handbook of theory, research, and clinical practice* (pp. 414–421). New York: Guilford Press.
- Martin, K. A., Rejeski, W. J., Leary, M. R., McAuley, E., & Bane, S. (1997). Is the social physique anxiety scale really multidimensional? Conceptual and statistical arguments for a unidimensional model. *Journal of Sport & Exercise Psychology*, *19*, 359–367.
- Martin Ginis, K. A., Lindwall, M., & Prapavessis, H. (2007). Who cares what other people think? Self-presentation in sport and exercise. In G. Tenenbaum & R. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 136–157). Hoboken, NJ: Wiley.
- McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, *114*, 376–390.
- Murru, E. C., Martin Ginis, K. A., & Strong, H. A. (2007, November). *Psychometric properties of a state Social Physique Anxiety Scale*. Paper presented at the meeting of the Canadian Society for Psychomotor Learning and Sport Psychology, Windsor, ON.
- Posavac, H. D., Posavac, S. S., & Weigel, R. G. (2001). Reducing the impact of media images on women at risk for body image disturbance: Three targeted interventions. *Journal of Social and Clinical Psychology*, *20*, 324–340.
- Sinden, A. R., Martin Ginis, K. A., & Angove, J. (2003). Older women's reactions to revealing and non-revealing exercise attire. *Journal of Aging and Physical Activity*, *11*, 445–458.
- Spitzer, B. A., Henderson, K. A., & Zivian, M. T. (1999). Gender differences in population versus media body sizes: A comparison over four decades. *Sex Roles*, *40*, 545–565.
- Tiggemann, M., & McGill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology*, *23*, 23–44.
- Tiggemann, M., & Slater, A. (2004). Thin ideals in music television: A source of social comparison and body dissatisfaction. *International Journal of Eating Disorders*, *35*, 48–58.
- Williams, P. A., & Cash, T. F. (2001). Effects of a circuit weight training program on the body images of college students. *International Journal of Eating Disorders*, *30*, 75–82.