

Research report

Examining social physique anxiety and disordered eating in college women. The roles of social comparison and body surveillance

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ABSTRACT

Social physique anxiety has been found to be associated with disordered eating. However, what is not yet known is what behaviors college women may engage in that strengthen this relation. In the current study, we examined two possible moderating factors, social comparison and body surveillance. We examined whether these moderators might also generalize to trait anxiety, as well. Participants were 265 women attending a Southeastern university. Social comparison (both general and appearance-related) and body surveillance were tested as moderators of the relation between social physique anxiety and disordered eating. Results indicated that general social comparison, appearance-related social comparison, and body surveillance significantly moderated this relation. Individuals who were high in social physique anxiety and who reported high levels of general or appearance-related social comparison or body surveillance reported much higher levels of disordered eating than those with high social physique anxiety and low levels of these behaviors. Results indicated that only the trait anxiety \times body surveillance interaction was significant in identifying elevated disordered eating. Results provide information regarding who may experience high levels of disordered eating in association with social physique anxiety, which has clinical implications including the conceptualization of social comparison and body surveillance as safety behaviors.

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Introduction

College women are a group at risk for disordered eating, as between 4% and 9% of college women have diagnosable eating disorders (Hesse-Biber, Marino, & Watts-Roy, 1999; Keel, Heatherton, Dorner, Joiner, & Zalta, 2006; Pyle, Neuman, Halvorson, & Mitchell, 1991) and 34% to 67% experience disordered eating at subthreshold levels (e.g., Berg, Frazier, & Sherr, 2009; Franko & Omori, 1999; Hoerr, Bokram, Lugo, Bivins, & Keast, 2002; Krahn, Kurth, Gomberg, & Drewnowski, 2005; Mintz & Betz, 1988; Mintz, O'Halloran, Mulholland, & Schneider, 1997). One construct associated with disordered eating is social physique anxiety, a type of anxiety that occurs as the result or prospect of others negatively evaluating one's body (Hart, Leary, & Rejeski, 1989). For example, an individual may experience social physique anxiety when in a bathing suit at the beach, as she may perceive that this situation will possibly prompt others to evaluate her body in a negative way. Because of its focus on interpersonal evaluation and self-presentational concerns (Brunet, Sabiston, Dorsch, & McCreary, 2010; Hart et al., 1989), social physique anxiety may be a particularly relevant construct for college women given that both social interactions and weight and shape become increasingly important and salient in

the college setting (Bosari & Carey, 2001; Cash & Green, 1986; Cook-Cottone & Phelps, 2003; Fallon & Rozin, 1985; Fitzsimmons-Craft, 2011; Martin & Hoffman, 1993). Indeed, research has indicated that social physique anxiety is associated with disordered eating among undergraduate women (Cox, Lantz, & Mayhew, 1997; Diehl, Johnson, Rogers, & Petrie, 1998; Frederick & Morrison, 1998). Hayes and Ross (1987) purported that such anxiety and concerns about one's social image may lead women to engage in disordered eating in an attempt to embody society's ideal of beauty, the thin ideal. However, what is not yet known is what factors might exacerbate this relation. What behaviors might college women engage in that strengthen the relation between social physique anxiety and disordered eating, heightening risk for eating pathology? In this study, we examine how two potential moderators, social comparison and body surveillance, interact with social physique anxiety to identify elevated levels of disordered eating in a sample of college women.

Individuals likely manage social physique anxiety in various ways (Hart et al., 1989). Indeed, Kowalski, Mack, Crocker, Niefer, and Fleming (2006) found that females reported using various coping strategies to manage social physique anxiety, including behavioral avoidance (e.g., physically keep away from a stressor), short-term appearance management strategies (e.g., selectively display or monitor one's appearance), social support, cognitive avoidance (e.g., ignore the situation, try to forget about it), and acceptance.

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Similar results were obtained by Sabiston, Sedgwick, Crocker, Kowalski, and Mack (2007). As put forth by these researchers, it may be that most of these strategies are effective in the short-term but rather ineffective in the longer term (Kowalski et al., 2006).

In fact, it may be that many of the strategies individuals use to cope with social physique anxiety can be conceptualized as safety behaviors, or actions that are intended to detect, avoid, escape, or endure a negative or feared outcome (Abramowitz, Deacon, & Whiteside, 2011; Salkovskis, Clark, & Gelder, 1996). Such behaviors have been found to be quite common in response to anxiety among those with anxiety disorders (Powers, Smits, & Telch, 2004; Sloan & Telch, 2002). For example, many individuals with obsessive-compulsive disorder (OCD) experience unwanted intrusive thoughts (e.g., doubt whether important paperwork was completed properly), and in response, may engage in checking as a type of safety behavior (i.e., engage in checking as a means to detect whether their feared outcome has occurred; Abramowitz et al., 2011). Such safety behaviors may momentarily reduce anxiety, but in general, tend to enhance anxiety in the long run given that they prevent disconfirmation of maladaptive thoughts and beliefs (Salkovskis, 1991; Thwaites & Freeston, 2005). By engaging in safety behaviors, individuals can diminish or eliminate their anxiety in the moment and seemingly prevent the occurrence of feared outcomes (e.g., completing important paperwork incorrectly); however, safety behaviors have the “paradoxical effect” of maintaining and/or strengthening the maladaptive thoughts that originally led to the anxiety (e.g., checking important paperwork many times is necessary; Abramowitz et al., 2011, p. 47). Thus, overall, safety behaviors help maintain anxiety since they prevent individuals from learning that a particular threat is non-existent or manageable.

Similarly, individuals may engage in various safety-type behaviors in an effort to manage social physique anxiety. For instance, Haase, Mountford, and Waller (2007) found that one way that individuals cope with social physique anxiety may be via engagement in body checking behavior. This refers to the repeated checking of one's body shape and/or weight and may involve behaviors such as repeatedly weighing oneself, touching one's collar bone to determine the protrusion of the bone, pinching excess skin, and measuring the circumference of one's thighs or forearms (Fairburn, Cooper, & Shafran, 2003; Shafran, Fairburn, Robinson, & Lask, 2004). Haase et al. (2007) purported that such behaviors could be construed as a safety behaviors in that they likely initially reduce anxiety but actually enhance it and are associated with negative outcomes more generally. Additional behaviors that individuals may use to cope with social physique anxiety and that may be construed as safety and checking behaviors include social comparison and body surveillance.

Social comparison

Social comparison theory (Festinger, 1954) forwards that humans engage in social comparison with others in order to understand how and where they fit into the world when objective standards are not available. Research has indicated that women frequently make appearance-related social comparisons (Leahey, Crowther, & Mickelson, 2007) and that such comparisons are generally in the upward direction (i.e., the individual compares themselves to someone they deem as more attractive or “better off” in some area; Morrison, Kalin, & Morrison, 2004). For instance, Leahey and colleagues (2007) found that more than 80% of comparisons made by women in their natural environment (i.e., in a naturalistic/ecological momentary assessment study) with others, including peers and models, are in the upward direction. These upward appearance comparisons generally result in negative outcomes, such as body dissatisfaction (Thompson, Heinberg, Altabe,

& Tantleff-Dunn, 1999), because of the gap that is typically created between the individual's actual and ideal selves (Cash & Szymanski, 1995).

Further, frequent engagement in appearance comparisons with peers has been found to be associated with disordered eating (e.g., Bamford & Halliwell, 2009; Stormer & Thompson, 1996; Thompson, Heinberg, & Tantleff, 1991). Research has indicated that general social comparison tendencies are associated with negative outcomes, as well (e.g., Gilbert & Meyer, 2003; Morrison et al., 2004). For instance, the general tendency to compare one's performance with others has been found to be significantly correlated with drive for thinness, body dissatisfaction, and bulimic attitudes (Gilbert & Meyer, 2003). Further, research has indicated that general social comparison tendencies are heightened among college women with eating disorder symptoms compared to their asymptomatic peers (Corning, Krumm, & Smitham, 2006). Given that prior research has found associations between both general and appearance-related social comparison tendencies and disordered eating, we chose to examine social comparison in these two ways (i.e., generally and specific to appearance) in this study. Of particular interest in the context of the current study is the fact that college campuses provide environments that lend themselves to engaging in social comparisons. That is, women are surrounded by many other women of approximately the same age with whom they interact with both directly (e.g., in class) and indirectly (e.g., passing another woman on campus) on a near constant basis (Lindner, Hughes, & Fahy, 2008).

Body surveillance

Objectification theory holds that within dominant American culture, the feminine body has been construed as an object to be looked at and gazed upon; thus, girls and women learn to view themselves from the perspective of the observer and to treat themselves as objects to be looked at (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). In addition to being made to feel like objects, women are given the message that they have the ability to control their bodies and that given the appropriate amount of effort, it is possible to comply with cultural standards of beauty (i.e., the thin ideal; McKinley & Hyde, 1996). The internalization of the “objectifying observer's” (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998) perspective of one's own body is known as self-objectification, which manifests itself in the act of body surveillance (Moradi & Huang, 2008) – a behavior that many women feel they must engage in constantly in order to ensure their compliance with the thin ideal (Gilbert & Thompson, 1996; McKinley, 2004; Thompson & Stice, 2001). The aforementioned behavior of body checking can be considered one specific example of the broader construct of body surveillance. It is via body surveillance that many women perceive there to be a discrepancy between their actual and ideal selves, and thus, such surveillance often results in various negative outcomes, including body dissatisfaction, low body esteem, and disordered eating (McKinley & Hyde, 1996).

Social comparison and body surveillance as moderators of the relation between social physique anxiety and disordered eating

We purport that individuals may use social comparison and body surveillance to cope with social physique anxiety, that these constructs may be conceptualized as safety behaviors, and that these comparison and surveillance behaviors strengthen the relation between social physique anxiety and disordered eating. In line with conceptualizations of the nature and function of safety behaviors (e.g., Abramowitz et al., 2011), we speculate that these

behaviors may at least momentarily reduce social physique anxiety via their *potential* to reassure the individual about her body and their ability to provide her with a sense of control and active coping. Also in line with theory about safety behaviors, we suspect that, in general, social comparison and body surveillance likely represent maladaptive coping strategies that maintain the anxiety and negative outcomes, like disordered eating. For example, in response to social physique anxiety, some individuals may engage in social comparison behavior as a means to cope with this anxiety and give themselves a sense of how their appearance stands in comparison to others. Indeed, research has indicated that individuals often use social comparison as a means to cope with stress or negative affect (e.g., Buunk, 1995; Taylor, Buunk, & Aspinwall, 1990). Similarly, an individual may use body surveillance in response to social physique anxiety in order to give herself a sense of how she appears to others and how her appearance stands relative to cultural standards of beauty/the thin ideal, which may temporarily provide the individual with a sense of control and reduce anxiety about possible evaluation. Yet, as previously noted, social comparison and body surveillance are more generally associated with negative outcomes and may serve to strengthen the relation between social physique anxiety and disordered eating given that in the end, social comparison and body surveillance likely do not reassure the individual about her appearance.

One extension of interest is whether the hypothesized interactions involving social comparison and body surveillance are specific to social physique anxiety or might also generalize to trait anxiety. That is, might general anxiety proneness interact with social comparison and body surveillance to also predict increased disordered eating? It is possible that social comparison and body surveillance may be behaviors that individuals engage in to manage their general anxiety as well as their social physique anxiety. Interestingly, prior research has indicated that other maladaptive coping strategies (i.e., emotion-focused coping) interact with trait anxiety to predict higher levels of disordered eating (Fitzsimmons & Bardone-Cone, 2011a). We expect the findings regarding social physique anxiety, social comparison, body surveillance, and disordered eating to be stronger than those related to trait anxiety given that social comparison and body surveillance represent coping strategies that are likely more closely linked with social physique anxiety than trait anxiety.

The current study

In the current study, we tested moderator models of the relation between social physique anxiety and disordered eating and the relation between trait anxiety and disordered eating. First, we examined whether the relation between social physique anxiety and disordered eating was affected by social comparison or body surveillance. We hypothesized that increased engagement in these behaviors would interact with social physique anxiety to identify higher levels of disordered eating. In particular, we predicted that the combination of high social physique anxiety and high levels of social comparison or body surveillance would be associated with higher levels of disordered eating.

Second, we examined whether the relation between trait anxiety and disordered eating was affected by social comparison or body surveillance. We expected that the interaction of high trait anxiety and high levels of social comparison or body surveillance would be associated with high levels of disordered eating. However, we expected the interactions involving social physique anxiety to be stronger than the interactions involving trait anxiety.

Method

Participants

Participants were 265 women attending a Southeastern university who ranged in age from 17 to 27 years, with a mean age of 19.12 years ($SD = 1.46$). Recruitment occurred through introductory psychology courses and other psychology courses. Most women (66.0%) identified themselves as Caucasian, 17.0% as African American or African, 6.4% as Asian, 1.9% as Hispanic, 1.1% as Native American, 7.2% as biracial/biethnic, and .4% as other races/ethnicities. Highest parental education was used as a proxy for socioeconomic status and ranged from 7 to 21 years ($M = 16.45$ years, $SD = 2.63$).

Procedure

Participants completed a set of computer-based questionnaires in a research laboratory as part of a study presented as an investigation of personality and cognition. Questionnaires were presented in a fixed order and were administered to participants in a quiet room after obtaining written consent. Survey completion took 30–45 min, and participants received course credit for their involvement. This study was reviewed and approved by the university's Institutional Review Board.

Measures

Demographics

Demographic data for age, parents' highest levels of education attained, and race/ethnicity were collected via a set of questionnaires created for this study.

Social physique anxiety

Social physique anxiety was measured using the Social Physique Anxiety Scale (SPAS; Hart et al., 1989). This measure consists of twelve items that assess the degree to which an individual becomes anxious when others observe or evaluate her physique. Participants are asked to rate the extent to which each item is characteristic of them on a 5-point scale ranging from 1 (*not at all characteristic*) to 5 (*extremely characteristic*), with higher scores indicating a greater degree of social physique anxiety. An example item is, "In the presence of others, I feel apprehensive about my physique/figure." Evidence of construct validity is suggested by significant positive correlations between the SPAS and measures that assess general concern regarding others' evaluations and a significant negative correlation between the SPAS and body esteem (Hart et al., 1989). Hart and colleagues (1989) found good internal consistency (coefficient alpha = .90) and eight-week test-retest reliability ($r = .82$) in a sample of college students; in the present study, alpha was .92.

Trait anxiety

Trait anxiety, which refers to the "relatively stable individual differences in anxiety proneness" (Spielberger, Gorsuch, & Lushene, 1970, p. 3), was assessed using the 20-item trait anxiety scale of the Spielberger State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970). These items, which ask about one's general tendency to experience anxiety, are rated on a 4-point scale ranging from 1 (*almost never*) to 4 (*almost always*), with higher scores indicating a greater degree of trait anxiety. Construct validity is demonstrated by the fact that scores for the state anxiety scale items consistently vary in the face of different stressors, while the scores for the trait scale items do not (Hedberg, 1972). Additionally, the STAI trait anxiety scale has been found to correlate

highly with other measures of negative affect (Watson & Clark, 1984) and to differentiate between individuals with and without anxiety disorders (Taylor, Koch, & McNally, 1992). Further, the STAI trait anxiety scale has been found to have good test–retest reliability (.97 – Metzger, 1976; .86 – Rule & Traver, 1983). In the current study, alpha was .91.

Social comparison

General social comparison tendencies were measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). This measure consists of 11 items that are rated on a 5-point scale ranging from 1 (*I disagree strongly*) to 5 (*I agree strongly*), with higher scores indicating a greater tendency to engage in social comparisons across life domains. An example item is, “If I want to find out how well I have done something, I compare what I have done with how others have done.” Construct validity is demonstrated by the INCOM’s significant positive correlations with neuroticism, public and private self-consciousness, and social anxiety (Gibbons & Buunk, 1999). Gibbons and Buunk (1999) found that estimates of internal consistency ranged from .78 to .85 in college students; in the present study, alpha was .82.

Appearance-related social comparison tendencies were assessed using the Physical Appearance Comparison Scale (PACS; Thompson et al., 1991). This measure assesses an individual’s tendency to compare her own appearance to the appearance of others and consists of five items, which are rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*), with higher scores indicating a greater tendency to engage in appearance comparisons. An example item is, “At parties or other social events, I compare my physical appearance to the physical appearance of others.” Construct validity is demonstrated by strong correlations between the PACS and measures of body dissatisfaction and eating disturbance (Thompson et al., 1991). Thompson and colleagues (1991) found adequate internal consistency (coefficient alpha = .78) in a sample of college women; in the present study, alpha was .82.

Body surveillance

Body surveillance behavior was measured with the Body Surveillance subscale of the Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996). This subscale consists of eight items that are rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating higher levels of surveillance or habitual body monitoring and thinking of one’s body in terms of how it looks rather than how one feels. An example item is, “During the day, I think about how I look many times.” Of note, if more than two items are missing on an OBCS subscale (with a “not applicable” option being counted as missing), then the score for that subscale is not computed (McKinley & Hyde, 1996). Only one study participant had more than two items missing on the Body Surveillance subscale and thus a score for this subscale was not computed for this individual. Construct validity is demonstrated by high correlations with public self-consciousness ($r = .73$) and non-significant relations with private self-consciousness (McKinley & Hyde, 1996). McKinley and Hyde (1996) reported a coefficient alpha of .89 in a sample of student and nonstudent women, and in the current study, alpha was .82.

Disordered eating

Disordered eating was assessed with the Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), one of the most widely used standardized measures of eating disorder attitudes and behaviors (Garner, 1993). The EAT-26 consists of 26 items that are rated on a 6-point scale ranging from 1 (*never*) to 6 (*always*), with higher scores reflecting greater eating pathology. An example item is, “Find myself preoccupied with food.” Items endorsed as 1, 2, or 3 are scored as “0,” while items marked as 4,

5, or 6, are scored as “1,” “2,” or “3,” respectively. Studies have found the EAT-26 to be effective as a screening measure, with a cutoff score of 20 indicating a probable eating disorder (King, 1989, 1991). Additionally, good internal consistency ($\alpha = .83-.90$) and test–retest reliability ($r = .84$) have been demonstrated in samples of young women (Carter & Moss, 1984; Garner et al., 1982). In the current study, alpha was .88.

Analytic strategy

In order to test the hypothesized moderator models, hierarchical multiple regression was used with the dependent variable of disordered eating, assessed via the EAT-26. In Step 1, social physique anxiety (or trait anxiety) and the moderator of interest (e.g., general social comparison) were entered as independent variables. In Step 2, the two-way interaction of social physique anxiety (or trait anxiety) and the moderator (e.g., social physique anxiety \times general social comparison) was entered. As recommended by Frazier, Tix, and Barron (2004), interaction terms were created by multiplying together the centered, continuous anxiety variable and the centered, continuous moderator. The nature of the significant interactions was then assessed via simple slope analyses (Aiken & West, 1991).

Results

Descriptive statistics

Means and standard deviations for the study variables and their correlations are presented in Table 1. Correlations were generally as expected based on the literature; that is, we observed significant, positive correlations among all of the study variables.

Social physique anxiety \times social comparison interactions

Two hierarchical multiple regressions were performed involving the interaction of social physique anxiety and social comparison in relation to disordered eating. These results are displayed in Table 2. Both the social physique anxiety \times general social comparison and social physique anxiety \times physical appearance comparison interactions were significant ($t(237) = 2.96, p = .003$; $t(243) = 3.93, p < .001$, respectively). Women with high levels of social physique anxiety who engaged in *high* levels of general or physical appearance social comparison had higher levels of disordered eating than those with high social physique anxiety and low general or physical appearance social comparison orientation (see Figs. 1 and 2 where high and low levels of the independent variables were determined by one *SD* above and below the mean, respectively.) Further, simple slope analyses indicated that general and physical appearance social comparison behavior were significantly associated with disordered eating at high levels of social physique anxiety (1 *SD* above the mean) ($\beta = .22, t(237) = 2.83, p = .005$ for the model involving general comparison; $\beta = .35, t(243) = 4.95, p < .001$ for the model involving appearance comparison), but not at low levels of social physique anxiety (1 *SD* below the mean) ($\beta = -.07, t(237) = -1.02, p = .308$ for the model involving general comparison; $\beta = -.03, t(243) = -.315, p = .753$ for the model involving appearance comparison).

Social physique anxiety \times body surveillance interaction

A hierarchical multiple regression was also performed involving the interaction of social physique anxiety and body surveillance in relation to disordered eating (see Table 2); this interaction was significant ($t(245) = 6.02, p < .001$). As seen in Fig. 3, like the results of

Table 1
Correlations among and means and standard deviations of the measured variables ($N = 265$).

	1	2	3	4	5	6	
1. SPAS	–						$M = 37.14, SD = 9.83$
2. STAI, Trait Anxiety	.53***	–					$M = 42.19, SD = 9.69$
3. INCOM	.32***	.32***	–				$M = 40.23, SD = 6.44$
4. PACS	.49***	.36***	.53***	–			$M = 15.40, SD = 3.85$
5. OBCS, Surveillance	.58***	.44***	.41***	.64***	–		$M = 4.73, SD = .99$
6. EAT-26	.57***	.46***	.22***	.43***	.47***	–	$M = 7.94, SD = 8.61$

Note. SPAS = Social Physique Anxiety Scale. STAI = State-Trait Anxiety Inventory. INCOM = Iowa-Netherlands Comparison Orientation Measure. PACS = Physical Appearance Comparison Scale. OBCS = Objectified Body Consciousness Scale. EAT-26 = Eating Attitudes Test-26. Possible ranges for the study variables are as follows: SPAS (12–60), STAI (20–80), INCOM (11–55), PACS (5–25), OBCS, Surveillance (1–7), EAT-26 (0–78).

*** $p < .001$.

Table 2
Hierarchical multiple regression analyses of the interaction of social physique anxiety (SPAS) and social comparison and body surveillance moderators in relation to disordered eating (EAT-26).

Step and predictors	B	SE B	β	t (dfs)	p	ΔR^2
Step 1						.33***
SPAS	.47	.05	.55***	9.78 (2,238)	<.001	
General social comparison	.08	.07	.06	1.04 (2,238)	.297	
Step 2						.02**
SPAS \times general social comparison	.02	.01	.16**	2.96 (1,237)	.003	
Step 1						.34***
SPAS	.41	.05	.47***	7.91 (2,244)	<.001	
Physical appearance social comparison	.42	.13	.19**	3.17 (2,244)	.002	
Step 2						.04***
SPAS \times physical appearance social comparison	.04	.01	.20***	3.93 (1,243)	<.001	
Step 1						.35***
SPAS	.39	.06	.44***	7.03 (2,246)	<.001	
Body surveillance	1.88	.55	.22**	3.44 (2,246)	.001	
Step 2						.08***
SPAS \times Body surveillance	.24	.04	.29***	6.02 (1,245)	<.001	

** $p < .01$.

*** $p < .001$.

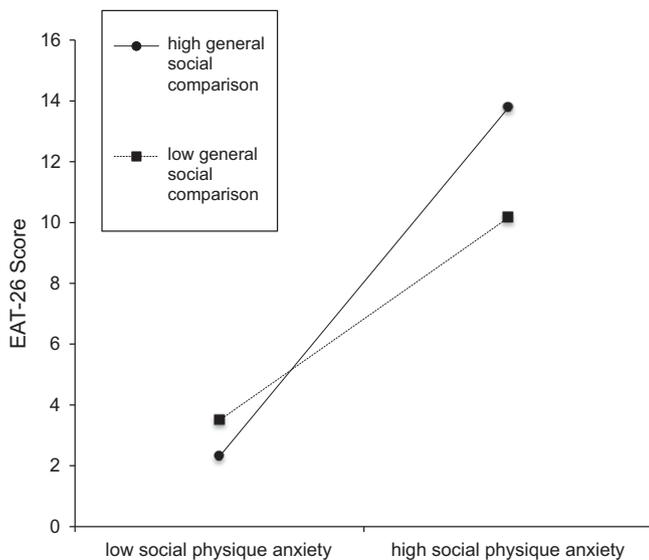


Fig. 1. The interaction of social physique anxiety and general social comparison with EAT-26 scores as the dependent variable.

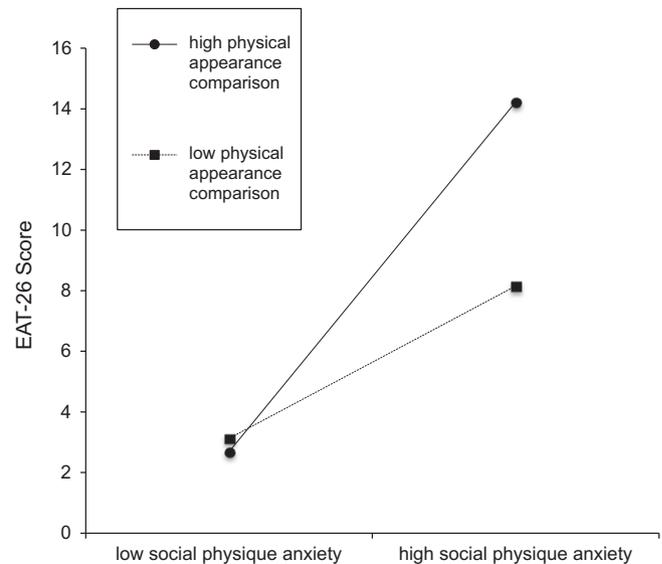


Fig. 2. The interaction of social physique anxiety and physical appearance social comparison with EAT-26 scores as the dependent variable.

the social physique anxiety \times social comparison interactions, those with high levels of social physique anxiety who engaged in high levels of body surveillance had higher levels of disordered eating than those with high social physique anxiety and low levels of body surveillance. This suggests that high levels of body surveillance may strengthen the relation between social physique anxiety

and disordered eating. Simple slope analyses confirmed that body surveillance was significantly associated with disordered eating at high levels of social physique anxiety ($\beta = .51, t(245) = 6.67, p < .001$), but not at low levels of social physique anxiety ($\beta = -.04, t(245) = -.55, p = .585$).

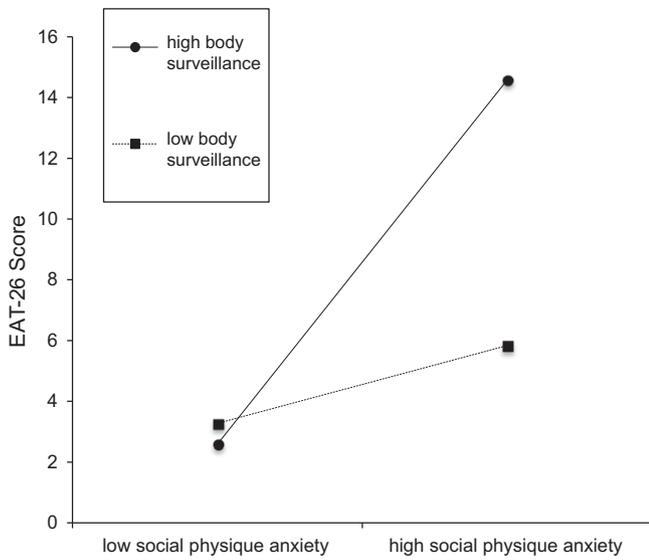


Fig. 3. The interaction of social physique anxiety and body surveillance with EAT-26 scores as the dependent variable.

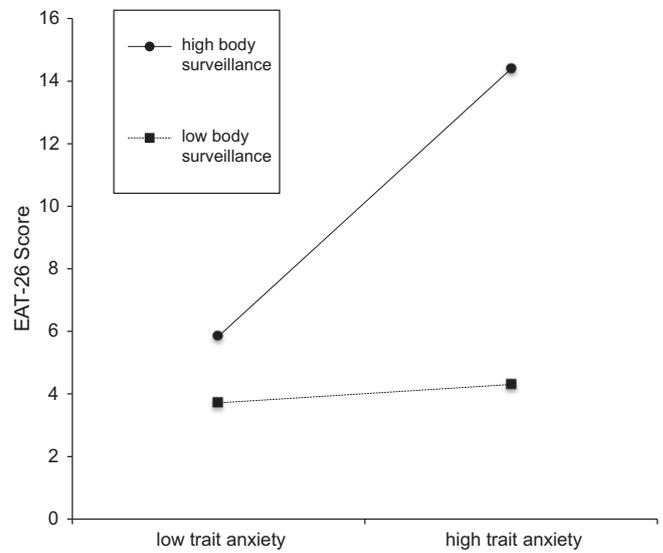


Fig. 4. The interaction of trait anxiety and body surveillance with EAT-26 scores as the dependent variable.

Trait anxiety × social comparison and trait anxiety × body surveillance interactions

Altogether, three hierarchical multiple regressions were performed involving the interaction of trait anxiety and various moderators in relation to disordered eating. These results are displayed in Table 3. Neither the trait anxiety × general social comparison nor the trait anxiety × physical appearance comparison interaction was significant in identifying disordered eating ($t(244) = .52, p = .601$ for the model involving general comparison; $t(250) = 1.60, p = .111$ for the model involving appearance comparison). However, the trait anxiety × body surveillance interaction was significant ($t(252) = 4.77, p < .001$). As seen in Fig. 4, those with high levels of trait anxiety who engaged in *high* levels of body surveillance had higher levels of disordered eating than those with high trait anxiety and low levels of body surveillance. Simple slope analyses confirmed that body surveillance was significantly associated with disordered eating at high levels of trait anxiety ($\beta = .58, t(252) = 7.67, p < .001$), but not at low levels of trait anxiety ($\beta = .12, t(252) = 1.72, p = .088$).

Discussion

In the current study, we examined whether the relation between social physique anxiety and disordered eating varied depending on levels of social comparison and body surveillance in a sample of college women. Our hypothesis that social comparison and body surveillance would moderate this relation was supported. We found that general social comparison, physical appearance social comparison, and body surveillance moderated the relation between social physique anxiety and disordered eating. As expected, individuals who were high in social physique anxiety and high in general social comparison, physical appearance social comparison, or body surveillance had significantly greater levels of disordered eating than those with high social physique anxiety and low levels of general social comparison, physical appearance social comparison, or body surveillance. Although social physique anxiety is somewhat damaging on its own, it seems that the combination of social physique anxiety and social comparison or body surveillance is what is especially problematic.

Given that social comparison and body surveillance are associated with negative outcomes, one may wonder why such behaviors

Table 3

Hierarchical multiple regression analyses of the interaction of trait anxiety (STAI) and social comparison and body surveillance moderators in relation to disordered eating (EAT-26).

Step and predictors	B	SE B	β	t (dfs)	p	ΔR^2
Step 1						.25***
STAI	.40	.05	.47***	8.05 (2,245)	<.001	
General social comparison	.09	.08	.07	1.22 (2,245)	.223	
Step 2						.00
STAI × general social comparison	.00	.01	.03	.52 (1,244)	.601	
Step 1						.30***
STAI	.32	.05	.36***	6.36 (2,251)	<.001	
Physical appearance social comparison	.66	.13	.30***	5.24 (2,251)	<.001	
Step 2						.01
STAI × physical appearance social comparison	.02	.01	.09	1.60 (1,250)	.111	
Step 1						.30***
STAI	.28	.05	.31***	5.36 (2,253)	<.001	
Body surveillance	2.97	.51	.34***	5.78 (2,253)	<.001	
Step 2						.06***
STAI × body surveillance	.21	.04	.24***	4.77 (1,252)	<.001	

*** $p < .001$.

are engaged in and maintained. As previously noted, it may be that in response to social physique anxiety and in an effort to gather relevant information, cope, and feel better, individuals engage in behaviors like social comparison and body surveillance, with these behaviors functioning as safety behaviors. For instance, in response to social physique anxiety, an individual may engage in social comparison as a means to cope with such anxiety and give herself a sense of how her appearance compares to others. Such “checking” of her appearance in comparison to others may temporarily reduce anxiety if the individual deems that she is “more attractive” or “thinner” than the comparison target or at least not as badly off as she thought. However, even if the comparison does not result in her concluding she is doing “better” than or as well as others in some sense, the act of comparison itself may provide the individual with information on what doing “better,” more closely embodying the thin ideal, or being more attractive looks like. Indeed, these upward comparisons may provide one with motivation, inspiration, and information on how to improve (Carmona, Buunk, Peiró, Rodríguez, & Bravo, 2006; Taylor & Lobel, 1989), which may provide the individual with a momentary sense of relief from her anxiety. Body surveillance may also function as a safety behavior because constant vigilance of one’s body and how one appears to others may provide some level of reassurance and anxiety relief that one will not stray too far from culturally mandated ideals. However, behaviors such as social comparison and body surveillance may be, at their core, associated with negative outcomes.

In particular, these behaviors likely strengthen the social physique anxiety-disordered eating relation in that in the longer run, social comparison and body surveillance fail to reassure the individual about her body (even if they were originally engaged in for just that purpose – to reassure the individual about her body in some way). For instance, one specific way in which social comparison and body surveillance may strengthen the social physique anxiety-disordered eating relation and fail to reassure the individual about her body is via various cognitive biases, such as selective attention to those body parts which the individual dislikes (Shafraan et al., 2004; Williamson, Muller, Reas, & Thaw, 1999). It may be that such behaviors actually serve to magnify perceived imperfections and thus, maintain social physique anxiety and its link to disordered eating (Fairburn, Shafraan, & Cooper, 1999; Mountford, Haase, & Waller, 2006). Further, social comparison and body surveillance may be conceptualized as appearance fixing strategies that are ultimately engaged in in an effort to change (or figure out how to change) one’s appearance (Cash, Santos, & Williams, 2005). However, such appearance fixing strategies likely represent maladaptive ways to manage social physique anxiety, as they may foster increased disordered eating over the longer term (Choma, Shove, Busseri, Sadava, & Hosker, 2009). Indeed, research has indicated that engagement in appearance fixing strategies, which can be considered safety behaviors (Hrabosky et al., 2009), is positively correlated with disordered eating (Cash et al., 2005; Choma et al., 2009).

Results indicated that general anxiety proneness also interacted with body surveillance (but not general or physical appearance social comparison) to identify elevated levels of disordered eating. It may be that social comparison interacted with social physique anxiety, but not trait anxiety, to identify increased disordered eating given the interpersonal nature of social physique anxiety. Social physique anxiety occurs as the result or prospect of others negatively evaluating one’s body (Hart et al., 1989), and thus, it makes sense that individuals would use an interpersonal process, such as social comparison, to manage that type of anxiety. Given that general anxiety proneness does not explicitly involve a social component, it may be that it does not typically make sense for individuals to manage such anxiety using a behavior like social comparison. The use of a more general checking behavior (e.g.,

body surveillance) or other coping strategies may be what is most appropriate in the face of general anxiety. However, we note that correlations between social physique anxiety and social comparison and trait anxiety and social comparison were of similar magnitudes. Given this, future research should continue to explore the potentially complex relations among social physique anxiety, trait anxiety, social comparison, body surveillance, and disordered eating.

Findings from the current study can also be considered in the context of self-presentation research. Self-presentation, or impression management, refers to the processes individuals use to monitor and control how they are perceived by others, with the goal generally being to create a good impression (Leary, 1992). Social physique anxiety has been described as one type of self-presentational concern (Krane, Stiles-Shipley, Waldron, & Michalenok, 2001), and in particular, can be thought of as an affective response reflecting concern for how one’s body is judged by others (Leary, 1992). As put forth by Koyuncu, Tok, Canpolat, and Catikkas (2010), cultural ideals strongly influence what females believe to comprise a positive self-presentation, and thus, women may believe that in order to be perceived positively by others, they must present a body that resembles the current cultural standard of beauty, the thin ideal (Krane et al., 2001). It seems as though social comparison and body surveillance may also play a role in self-presentation, as these are behaviors that individuals may use to ensure that the body they are presenting to others is in line with cultural ideals. In the future, research should more comprehensively assess the various factors that go into self-presentation, including social comparison and body surveillance, and how these play a role in the development and maintenance of disordered eating. For example, it may also be of value to examine the broader construct of perfectionistic self-presentation (e.g., McGee, Hewitt, Sherry, Parkin, & Flett, 2005) in conjunction with social comparison and body surveillance in this self-presentation framework.

This study contributes to the existing literature by expanding our understanding of the relation between social physique anxiety and disordered eating using more complex models (i.e., moderator models). In particular, knowledge regarding the social physique anxiety-disordered eating link was advanced by examining social comparison and body surveillance in relation to these constructs. Further, the conceptualization of social comparison and body surveillance as safety behaviors is a strength of the current investigation.

One limitation of the present study is generalizability; it will be important for future research to determine if these findings replicate in males, community samples, clinical samples, and more racially/ethnically diverse samples. Additionally, given the cross-sectional nature of the current study, it is unclear if the combination of social physique anxiety and social comparison/body surveillance causes disordered eating. Other study designs, including traditional longitudinal designs and ecological momentary assessment, are needed to confirm whether engaging in social comparison or body surveillance in the context of social physique anxiety temporally leads to disordered eating.

Although we believe that social comparison and body surveillance are most appropriately conceptualized as moderators of the relation between social physique anxiety and disordered eating – that is, as behaviors that strengthen the relation between these constructs – it will likely be important for future research to explore alternative/additional models. One such model would focus on how these constructs work in the context of mediation. For example, it is possible that social comparison and body surveillance may act as mediators of the social physique anxiety-disordered eating relation, as well. Further, it may be that instead of (or in addition to) individuals using social comparison and body surveillance in response to social physique anxiety, social

comparison and body surveillance lead to increased anxiety regarding one's social physique. For example, McCreary and Saucier (2009) posited that more frequent body-, muscularity-, and weight-related comparisons would lead to increased levels of social physique anxiety. Future research may thus wish to examine the potential dynamic relations among social physique anxiety, social comparison, body surveillance, and disordered eating. For instance, social physique anxiety may lead to social comparison and body surveillance, which in turn may lead to even greater social physique anxiety, resulting in a downward spiral (Fitzsimmons & Bardone-Cone, 2011b). Future longitudinal research is needed to explore questions regarding causality and temporal ordering, examine the short- and long-term effects of social comparison and body surveillance in the social physique anxiety-disordered eating relation, and examine the potential reciprocal relations among social physique anxiety, social comparison, and body surveillance.

Future research should explore the short- versus long-term effects of social comparison and body surveillance on mood, affect, and eating disorder symptomatology, as well. For example, it may be important to look closely at momentary affect prior to and following these behaviors via experience sampling methodology to get a sense of reinforcement patterns and to further test the idea that they can be understood as safety behaviors. If social comparison and body surveillance indeed operate as safety behaviors that are engaged in part to reduce immediate aversive affect (but that are associated with negative effects in the longer term), it would also be interesting for future research to examine the ways in which broader emotion regulation may be related to these behaviors. In particular, perhaps emotion regulation serves as a moderator of the relation between social physique anxiety and these safety behaviors, such that individuals who are otherwise able to manage aversive states are less likely to resort to social comparison and body surveillance.

Although these findings will need to be replicated in a clinical sample, the current study's moderator model suggests that more than one point of intervention is potentially possible in terms of reducing disordered eating – decreasing social comparison/body surveillance or decreasing social physique anxiety. To target social physique anxiety, clinicians should consider exposure-based methods (Haase et al., 2007). To target social comparison, clinicians may wish to work with their clients to make them aware of the biases apparent in their social comparisons and the consequences of making such comparisons; discussing such notions may provide the client with rationale for decreasing comparisons with others (Tiggemann & McGill, 2004). To target body surveillance, clinicians should help individuals build an awareness of such behavior through self-monitoring, and subsequently, aid in structuring cognitive and behavioral change of these behaviors (Fitzsimmons-Craft et al., 2012). Clinicians may also want to conceptualize social comparison and body surveillance as safety behaviors and collaboratively explore with the client how these behaviors may reduce her anxiety in the moment but contribute to long-standing patterns of disordered eating. Considering social comparison and body surveillance in such a framework may provide clients with motivation and a rationale for stopping these evaluative behaviors.

In conclusion, social comparison (both general and appearance-related) and body surveillance moderated the relation between social physique anxiety and disordered eating. Additionally, results indicated that body surveillance (but not general or appearance-related social comparison) moderated the trait anxiety-disordered eating relation. Our results suggest that low levels of social physique anxiety are associated with low levels of disordered eating regardless of the level of social comparison or body surveillance the individual engages in. However, for those with high levels of social physique anxiety, elevated use of social comparison or body

surveillance is associated with high levels of disordered eating, as compared to those with high levels of social physique anxiety who engage in low levels of social comparison/body surveillance. Thus, the current study provides researchers and clinicians with a better understanding of who experiences high levels of disordered eating in association with social physique anxiety. We purport that social comparison and body surveillance may be conceptualized as safety behaviors that some individuals may engage in response to social physique anxiety. These behaviors may provide the individual with a sense of momentary relief and active coping, but more generally and as suggested by results of the current investigation, appear to be associated with negative outcomes like disordered eating.

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