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Predictors of obesity bias among exercise science students

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Langdon J, Rukavina P, Greenleaf C. Predictors of obesity bias among exercise science students. *Adv Physiol Educ* 40: 157–164, 2016; doi:10.1152/advan.00185.2015.—The purpose of the present study was to investigate particular psychosocial predictors of obesity bias in prehealth professionals, which include the internalization of athletic and general body ideals, perceived media pressure and information, and achievement goal orientations. Exercise science undergraduate students ($n = 242$) filled out a survey containing questions of demographic characteristics, achievement goals, social-cultural attitudes toward appearance (using Sociocultural Attitudes Towards Appearance Questionnaire-3), and obesity bias measurements (using the antifat attitudes test and fat phobia scale). The results indicated that students were explicitly biased toward overweight and obese individuals, held had high task and ego goals, and had high internalization of an athletic body type ideal, as determined by mean scores being above the median values for each scale. Internalization of the athletic body type predicted obesity bias for fat phobia, weight control blame, and physical/romantic attractiveness. In conclusion, exercise science students may enter programs socialized from society and sport, and, potentially, these psychosocial attitudes and beliefs may have implications to working with future clients, especially for those of the general population and those whose body shape and size are different than themselves.

prehealth-related professionals; achievement goals; Sociocultural Attitudes Towards Appearance Questionnaire-3; athletic body ideal; weight control blame

OVERWEIGHT AND OBESE INDIVIDUALS are commonly discriminated against in a variety of settings across many nations (23). Such experiences are particularly troubling within health settings given that experiences of bias and discrimination are associated with health care avoidance and delay (8) as well as with increased health risk behaviors, such as physical inactivity and binge eating (22). Obesity bias has been documented among individuals in a variety of health and rehabilitative-related professions as well as prehealth professionals (5, 21, 25, 26, 28, 32). Given the pervasive nature of obesity bias among professionals, it may be useful to examine the attitudes and beliefs of preprofessionals within which bias could be addressed and remediated early. To date, few studies have included exercise science/health students (ESHS) as prehealth professionals.

ESHS are exposed to dominant cultural expectations and assumptions equating overweight and obesity with ill health, unattractiveness, and poor character (23). Individuals with overweightness and obesity are assumed to be unhealthy due to poor choices and lack of willpower and, as such, are thought to deserve the consequences of their weight status (26). Crandall (7) coined the term "ideology of blame" to reflect the societal justification for bias and discrimination against individuals who appear to be overweight or obese. On the other hand, bodies that appear to be lean and athletic are assumed to be healthy as a result of hard work and self-control (9) and therefore deserving of the rewards of that work ethic (17). As Richardson and colleagues have pointed out (24), ESHS students' views and beliefs about obesity are important to study and understand because of their role as future health professionals and the potential for educational intervention during undergraduate education. As a first step, the present study extends previous research by examining possible mechanisms underlying weight-related bias that could be targeted in undergraduate curricula.

The idealization of the lean and athletic body and the disparagement of the fat and overweight body are strongly communicated via mass media (12). ESHS, like individuals in the general population, are exposed to mass media messages that reinforce ideals about the body. ESHS, many of whom were/are involved in athletics, may be particularly susceptible to media messaging that idealizes the athletic body, portrayed as competent, competitive, and healthy (2). Internalization of the athletic and thin ideals may be associated with bias toward overweight individuals who are assumed to lack the work ethic to achieve those ideals.

In addition to the general socialization that ESHS experience, they commonly take courses that reinforce the lean body ideal by emphasizing health risks associated with high weight and body fat. However, students may miss the finer complexities of weight and weight management as related to health status and infer causation from correlational data. Previous research has documented that ESHS and professionals do endorse biased attitudes towards and beliefs about individuals who appear overweight or obese (6, 27). It is not surprising that exercise science and fitness professionals, given their training, tend to strongly attribute overweight and obesity to lack of personal control (11). This narrow focus on personal responsibility can be problematic in that it ignores other powerful influences, such as genetics, health conditions, and social and economic factors that also play a role in weight status and weight management (10).

Moreover, ESHS are likely to be socialized within the sport domain. Many ESHS have personal experience as athletes and have been exposed and socialized to adopt orientations that frame their attitudes toward achievement. Individuals may see achievement and success as self-referent (task) and/or as comparative (ego) (20). Task-oriented individuals tend to focus on personal effort and accomplishment of tasks, demonstrate persistence and high levels of effort, and experience satisfaction with task completion (3). Ego-oriented individuals may avoid

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Table 1. *Frequency of participation in various physical activity settings*

Variable	Frequency, %
Recreational activity participation	81
Recreational sport team participation	80.2
High school varsity sport participation	81
College intramural sport participation	99.2
College varsity sport participation	23.1

challenging tasks and feel discouraged when their performance is perceived as inferior to others. The competitive nature of athletics often supports a focus on social comparison, which may reinforce an ego orientation (3). Achievement orientation not only influences how an individual perceives his or her own success but also influences expectations for others' success based on perceived ability (30). In a teacher education study (15), possession of biased attitudes and feeling uncomfortable toward diversity were positively associated with performance-oriented goals (ego) and negatively associated mastery focused goals (task). It is reasonable to hypothesize that goal orientations are associated with attitudes toward overweight and obese individuals. ESHS possessing a stronger task orientation may be more comfortable working with what they assume to be healthy weight individuals and have realistic expectations for them. To the authors' knowledge, achievement orientations have not yet been examined in relationship to obesity bias.

The purpose of the present study was to investigate psychosocial predictors of obesity bias among ESHS. Specifically, internalization of athletic and general body ideals, perceived media pressure and information, and achievement goal orientations were included as possible predictors of obesity bias and fat phobia. An exploratory approach was taken as a first step toward developing a better understanding of the psychological and social factors that contribute to negative perceptions and stereotypes of overweight and obese individuals. This research is significant because if students have unrealistic expectations and biased beliefs toward overweight and obesity individuals, their effectiveness may be limited in helping people improve their health. By better understanding factors that contribute to bias, evidence-based educational programs can be developed to reduce bias with the ultimate goal of improving health professionals' effectiveness (24).

METHODS

Participants in this study were 242 undergraduate ESHS (mean age: 20.93 yr, SD: 1.78 yr, 40% men and 60% women) from two United States universities. The majority of participants were Caucasian (70.7%) followed by Black (20.2%), Hispanic (2.5%), Asian (1.2%), and Other (5.4%). The breakdown by school year was as follows: 0.4% freshmen, 17.8% sophomores, 41.1% juniors, and 19.1% seniors. Approximately 22% of participants did not indicate a year in school. In terms of body mass index classifications, 2.1% were underweight, 60% were normal weight, 28.8% were overweight, and 9.2% were obese. As shown in Table 1, the majority of participants had some experience with recreational activities and sport team participation as well as varsity sport team participation in high school and intramural participation in college. Only 23% of participants were student-athletes at their respective schools. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants being included in the study and completed via hard copy or web-based (Survey Monkey) survey. The administration order was counterbalanced to avoid an order effect.

The antifat attitudes test (AFAT) (16) was used to measure antifat attitudes toward obese individuals. The AFAT had a total of 34 items on a 5-point Likert scale ranging from *1* (strongly disagree) to *5* (strongly agree) using 3 subscales: *1*) weight control/blame (e.g., if bad things happen to fat people, they deserve it), *2*) social/character disparagement (e.g., most fat people don't keep their surroundings neat and clean), and *3*) physical/romantic unattractiveness, (e.g., it's hard not to stare at fat people because they are so unattractive). Lewis et al. (16) provided evidence of internal consistency and discriminant validity. Respectively, Cronbach α-values in the current sample were 0.82, 0.90, and 0.82.

The fat phobia scale (1) was a secondary measure used to measure antifat attitudes toward obese individuals. The questionnaire includes 14 pairs of adjectives used to describe overweight people situated on a semantic differential questions (e.g., lazy vs. industrious). The scores range from *1* to *5*. The scores are summed and divided by the total number of questions answered. Higher scores indicate higher fat phobia. See Bacon et al. (1) for evidence of concurrent validity. The Cronbach α-value was 0.93.

Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) (18) was used to assess dimensions of media influences on body image. A total of 30 questions using 4 subscales were rated on a 5-point Likert scale from *1* (definitely disagree) to *5* (definitely agree). The subscales included *1*) the internalization-athletic scale (e.g., "I compare my body to that of people in good shape"), *2*) internalization-general ("I compare my body to the bodies I see on

Table 2. *Means and SDs for goal orientation, dimensions of media influence on body image, and obesity bias constructs*

	Overall		Men		Women	
Variable	Mean	SD	Mean	SD	Mean	SD
Task orientation	4.37†	0.55	4.31	0.57	4.41	0.53
Ego orientation	3.52†	1.03	3.78	0.95	3.35	1.05
Internalization-athletic	3.59†	0.80	3.65	0.75	3.54	0.84
Internalization-general	2.92	0.85	2.87	0.72	2.96	0.93
Pressures	2.70†	0.97	2.32	0.74	2.96	1.02
Information	2.84†	0.65	2.80	0.59	2.87	0.69
Weight control/blame	2.95	0.66	3.09	0.64	2.86	0.65
Social/character disparagement	2.04†	0.64	2.25	0.67	1.91	0.58
Physical/romantic unattractiveness	2.86*	0.65	3.13	0.57	2.68	0.64
Fat phobia	3.57†	0.83	3.59	0.86	3.57	0.82

*$P < 0.01$ and †$P < 0.001$ for a one-sample *t*-test comparison with the scale midpoint.

Table 3. *Correlations between demographic characteristics, goal orientation, dimensions of media influence on body image, and obesity bias constructs*

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1. Sex	1											
2. Body mass index	−0.19†	1										
3. Task orientation	0.09	−0.05	1									
4. Ego orientation	−0.20†	0.01	0.28†	1								
5. Internalization-athletic	−0.07	−0.13	0.21†	0.21*	1							
6. Internalization-general	0.05	−0.14*	−0.04	0.12	0.42*	1						
7. Pressures	0.32†	−0.07	−0.06	−0.00	0.32†	0.72†	1					
8. Information	0.05	0.00	−0.08	0.11	0.13*	0.53†	0.45†	1				
9. Weight control/blame	−0.18†	−0.01	−0.03	0.13*	0.17†	0.09	0.01	0.04	1			
10. Social/character disparagement	−0.26†	0.08	−0.30†	0.02	−0.04	−0.01	−0.12	0.03	0.63†	1		
11. Physical/romantic unattractiveness	−0.34†	−0.08	−0.09	0.16*	0.15*	0.06	−0.15*	0.01	0.65†	0.68†	1	
12. Fat phobia	−0.01	−0.08	0.12	0.14*	0.27†	0.08	0.03	0.04	0.27†	0.14*	0.36†	1

*$P < 0.05$ and †$P < 0.01$.

television), *3*) pressures ("I've felt pressure from television or magazines to lose weight"), and *4*) information (television commercials are an important source of information about fashion and being attractive). Markland and Oliver (18) provided evidence for discriminant validity. Respectively, Cronbach α-values in the current sample were acceptable: 0.78, 0.87, 0.90, and 0.74.

The Modified Task and Ego Sport Questionnaire (31) was used to assess goal orientations. Participants were asked to think of the last time they were involved in physical education or movement skill learning, using the stem "I feel really successful in physical education or movement skill instruction in instructional settings when..." A total of 15 items were used to measure participants' goal orientations: 7

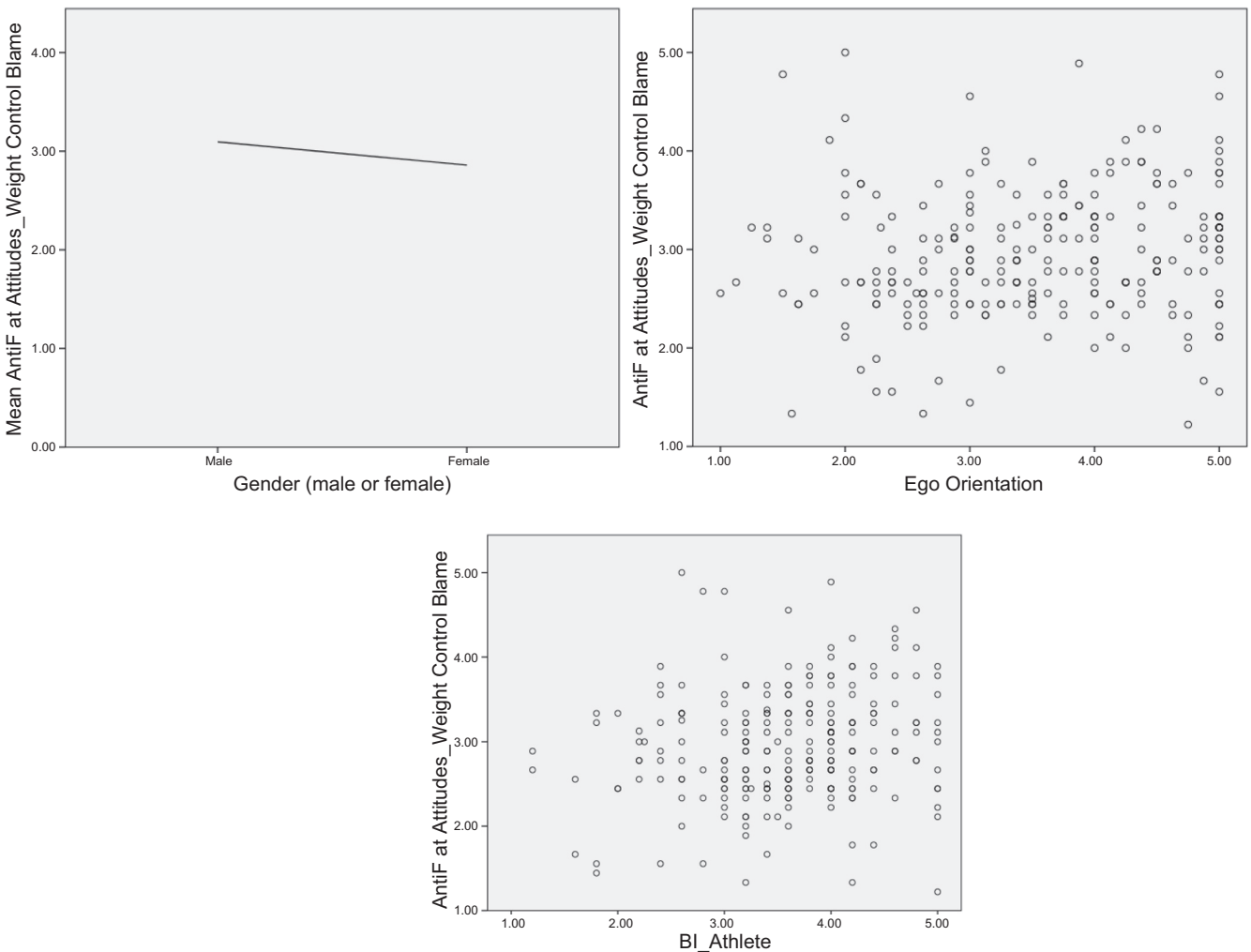

Fig. 1. Relationships between sex, ego orientation, and internalization-athletic to the measure of weight control blame. Scatterplots indicate that although the correlations were significant, they were somewhat weak in nature.

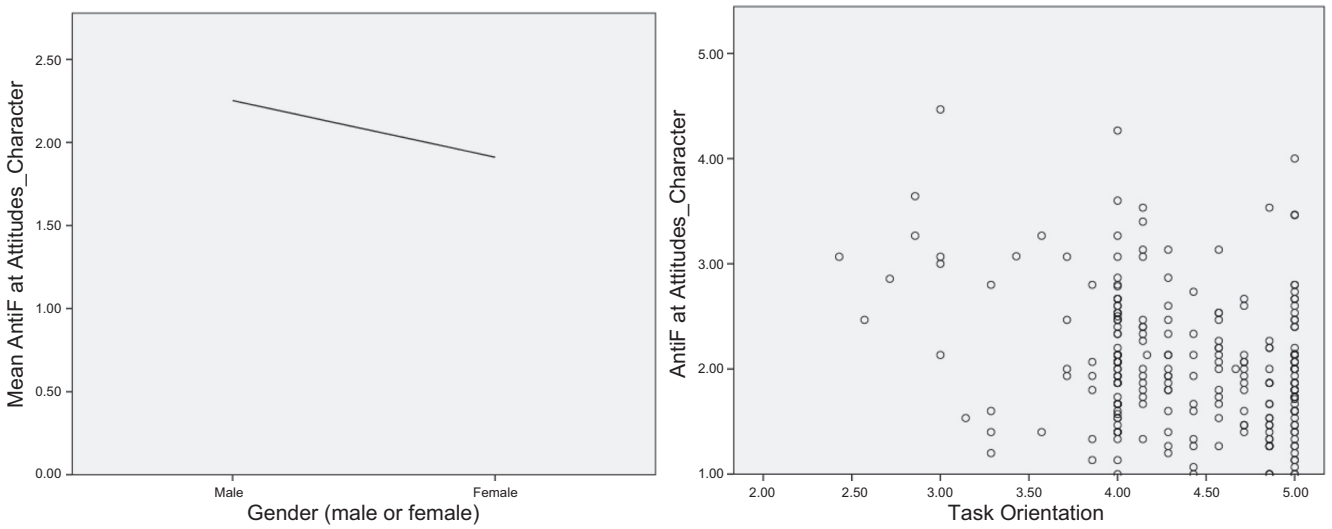

Fig. 2. Relationships between sex and task orientation to the measure of social/character disparagement. Scatterplots indicate that although the correlations were significant, they were somewhat weak in nature.

questions assessed their task involvement t (e.g., I can keep practicing hard) and 8 items assessed ego involvement (e.g., I have the highest score). The questions were rated on a Likert scale from *1* (strongly disagree) to *5* (strongly agree). Items were scored by averaging individual items scores. See Walling and Duda (31) for evidence of internal consistency and validity. In this sample, Cronbach α-value were 0.90 for task orientation and 0.94 for ego goal orientation.

Using SPSS (version 21), descriptive statistics for all data were run and screened for normality. After finding that all measures met the assumptions for the analysis, Pearson product-moment and Spearman ρ correlations were run to determine relationships between demographic variables, goal orientations, dimensions of media influence on body image, and measures of obesity bias. Any significant relationships were further explored via regression analyses. Four stepwise multiple regressions were used to determine potential predictors of obesity bias, one for each construct of the AFAT as well as the fat phobia scale. For all analyses, an α-level of 0.05 was adopted.

RESULTS

Descriptive statistics indicated that participants had a mean body mass index of 24.7 (SD: 4.46), placing them in the normal weight category. In addition, participants held stronger task-oriented goals than ego-oriented goals. The dimensions of media influence on body image were all midrange, with the exception of the internalization-athletic construct, whose mean was higher than all other constructs. In terms of antifat attitudes, all measures were also midrange. The fat phobia scale had a slightly higher mean than the other measures of obesity bias. To further illustrate this information, a comparison was made between the means of all measures and the scale midpoint of three. All measures differed significantly from the midpoint of the scales, with the exception of weight control/blame and general influence on body image. Means, SDs, and *P* values for all measures are shown in Table 2.

The correlation analysis revealed several significant relationships between demographic variables, goal orientations, dimensions of media influence on body image, and measures of obesity bias. For weight control/blame, a significant inverse relationship was found with sex as well as positive relationships with ego orientation and internalization-athletic constructs. For social/character disparagement, significant inverse relationships were found with task orientation and sex. For physical/romantic unattractiveness, significant inverse relationships were found with sex and pressures constructs in addition to positive relationships with ego orientation and internalization-athletic constructs. For fat phobia, positive relationships were found with ego orientation and internalization-athletic constructs. All correlation coefficients are shown in Table 3. Additionally, scatterplots are included for further interpretation in Figs. 1–4.

To further explore the correlations found with sex and obesity bias, *t*-tests were run between men and women to determine if differences were significant. The results of this analysis revealed significant differences in weight control/blame [$t(239) = 2.77$, $P < 0.01$], social/character disparagement [$t(239) = 4.19$, $P < 0.001$], and physical/romantic unattractiveness [$t(239) = 5.57$, $P < 0.001$]. Fat phobia was not found to be significantly different between sexes. More specifically, men tended to hold stronger beliefs for the three AFAT subscales than women.

For each regression analysis, predictor variables with significant relationships to obesity bias measures were entered in a stepwise fashion, according to the measure they were taken from. In other words, categorical constructs (sex) were added in a separate block from the other constructs. Regression analyses for each obesity bias measure revealed significant predictors. For weight control/blame, sex was entered in *step 1*, whereas ego orientation and internalization-athletic were entered in *step 2*. The results indicated that sex and internalization-athletic accounted for 4.7% of the variance [$F(2, 238) = 6.88$, $P < 0.001$], with a nearly equal contribution of predictive value for each construct. For social/character disparagement, sex was entered in *step 1*, whereas task orientation was entered in *step 2*. The results indicated that sex and internalization-athlete accounted for 13.7% of the variance [$F(2, 238) = 20.04$, $P < 0.001$]. β-Values for this regression indicated that task orientation was the stronger predictor, having three times the influence of sex in that relationship. For physical/romantic unattractiveness, sex was entered in *step 1*, whereas ego ori-

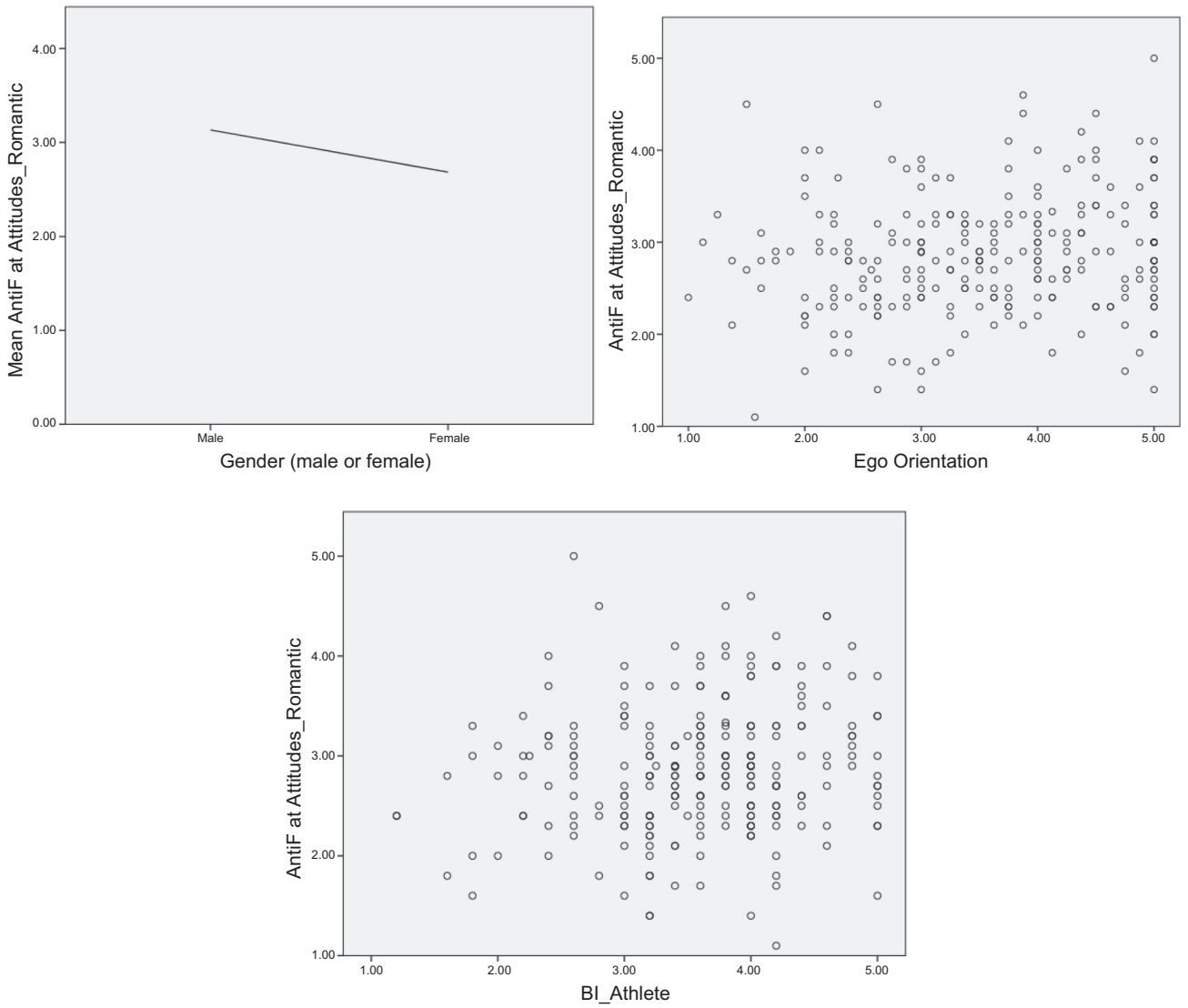

Fig. 3. Relationships between sex, ego orientation, and internalization-athletic to the measure of physical/romantic unattractiveness. Scatterplots indicate that although the correlations were significant, they were somewhat weak in nature.

entation, pressures, and internalization-athletic were entered in *step 2*. The results indicated that sex and internalization-athletic accounted for 11.2% of the variance [$F(2, 238) = 17.75$, $P < 0.001$]. In this case, sex had two times the influence of internalization-athletic. Finally, for fat phobia, ego orientation and internalization-athletic were entered simultaneously, with ego orientation being nonsignificant and internalization-athletic accounting for 4.9% of the variance [$F(2, 239) = 13.40$, $P < 0.001$]. Standardized β-coefficients for all entered variables are shown in Table 4.

DISCUSSION

The purpose of the present study was to investigate ESHS' association of societal pressures and internalization of body image and achievement goals with their explicit obesity bias. As expected, ESHS had moderate fat phobia and endorsed specific antifat stereotypes toward overweight and obese individuals as measured on the AFAT. Students endorsed that overweight and obese people like to eat, are physically unattractive, lack physical abilities, lack control, and lack confidence. These results are consistent with other studies that used semantic differentials to measure obesity bias in ESHS (6, 27).

Sex predicted or accounted for a significant portion of the variability in obesity bias constructs, specifically the AFAT subscales. Being male accounted for a higher proportion of the variability than being female. Also, compared with women, men held stronger biases on the AFAT measures. Research on sex differences in obesity bias is limited, but what exists is equivocal (11). Because of the evidence of sex socialization related to the body (19) and physical activity (14), additional research is needed to gain a clearer picture of how sex plays a role in bias, especially in those who intend to work with those in allied health areas.

Besides socialization by society, the sport and exercise domain can have an influence as well. In the present study, ESHS had a considerable amount of experience in movement settings, and >80% had participated in situations with a high level of competition (i.e., varsity athletics). Consistent with

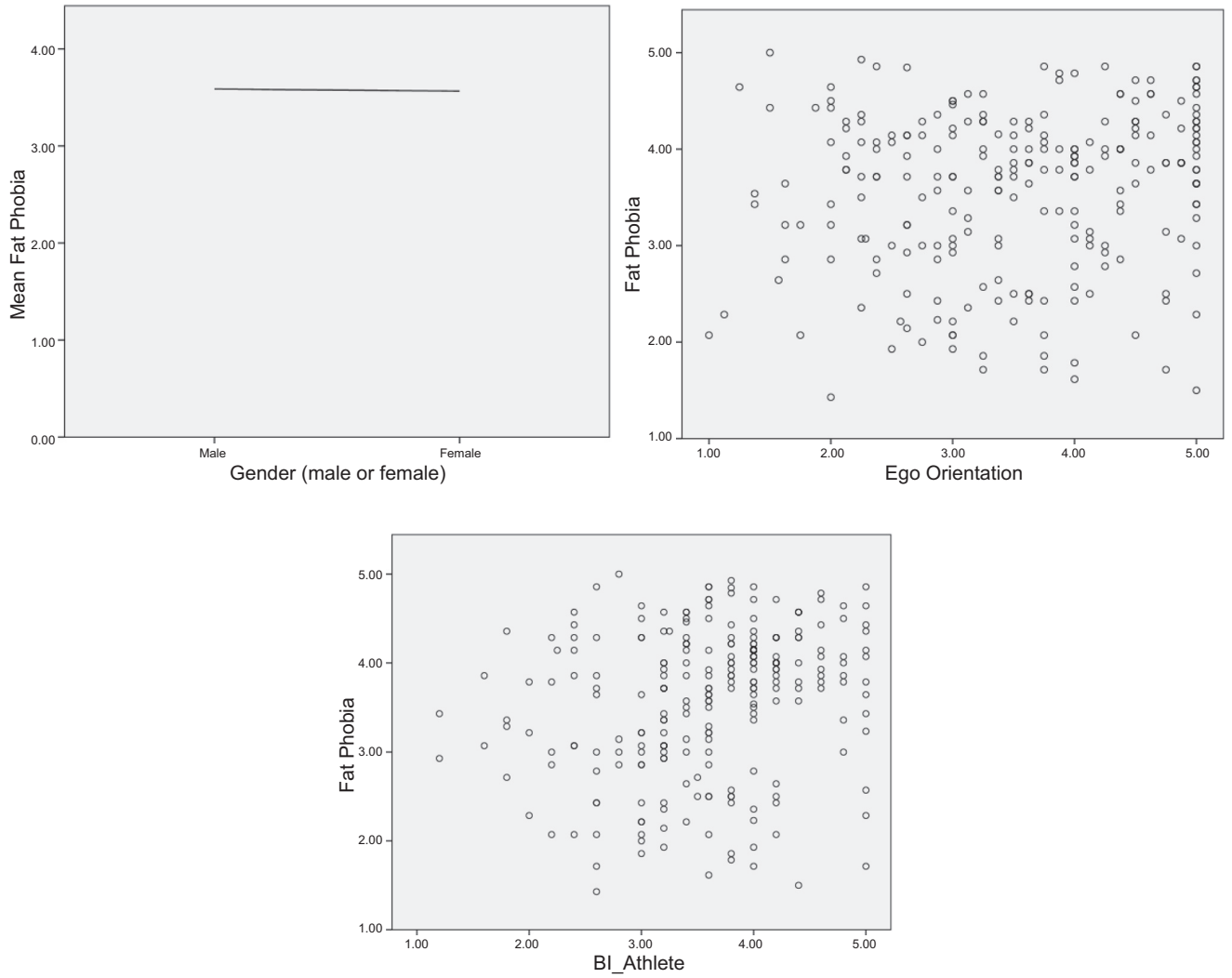

Fig. 4. Relationships between sex, ego orientation, and internalization-athletic to the measure of fat phobia. Scatterplots indicate that although the correlations were significant, they were somewhat weak in nature.

other research on female collegiate athletes (29), ESHS internalized the athletic body ideal but not the thin ideal as promoted by media. This finding is consistent with Bissell's report (4) that overall sport exposure does not have an effect but exposure to specific lean sports was linked to increased body dissatisfaction.

Overall, it is concerning that that the internalization of the athletic body predicted obesity bias in three of the four measures (fat phobia, weight control/blame, and physical/romantic attractiveness). It appears that those with the internalization of the athletic ideal may blame overweight and obese people for their condition and think being fat is not an acceptable body shape and size. Although the athletic body ideal may protect individuals' body dissatisfaction, this internalization may manifest itself differently when interacting with people in exercise settings. It is possible that the internalization of athletic body ideals, combined with other variables such as body satisfaction, may mediate the relationship between obesity bias or attitudes toward differential expectations or treatment of people of different body sizes and shape. More research is needed to understand the forces created from the athletic ideal in the exercise science and fitness fields. Again, given the level of the students' movement experience, it was not surprising that they endorsed both task and ego achievement goals. Higher levels of task goals negatively predicted social character disparagement (not the other obesity bias measures, though). Conceptually, this relationship makes sense. Possession of task goals is associated with the differentiation of ability and effort (20), which is consistent with the mindset of being open to individual differences. It is important that ESHS adopt task-oriented

Table 4. *Predictors of obesity bias*

Variable	β	*t*	Significance
Weight control/blame			
Sex	−0.16	−2.61	0.01
Internalization-athlete	0.15	2.44	0.02
Social/character disparagement			
Sex	−0.24	−3.93	<0.001
Task orientation	−0.78	−4.59	<0.001
Physical/romantic unattractiveness			
Sex	−0.33	−5.44	<0.001
Internalization-athlete	0.12	2.01	0.046
Fat fhobia			
Internalization-athlete	0.23	3.66	<0.001

goals because they may work with clients from the general population who do not possess the high levels of body awareness needed to understand the correct way to perform exercises.

On the other hand, higher ego-oriented achievement goals were correlated to obesity bias measures (fat phobia, physical/romantic attractiveness, and weight control/blame), although these orientations did not provide significant predictive weight in the regressions. Endorsement of high ego goals is conceptually associated with a belief that ability is the cause for success, self-conscious focus of one's ability relative to others, and the focus that those with high abilities have high status (30). It is likely that the focus on social comparison is what these constructs have in common. It is possible, in terms of weight control/blame, people have lower ability, and given the public nature of one's body, a "bad or unattractive body" compared with thin ones, should have a lower status (extrinsic reward). These students may want to avoid outcomes where they are not successful, such as being overweight. Although the correlations were small, given that both task and ego endorsement were associated with the athletic body ideal internalization, this warrants further investigation in how biases and athletic body ideal operate may operate via motivation-related constructs.

This study has several limitations. The authors only focused on explicit bias and task and ego differentiation. Future study should include implicit measures of bias in addition to considering the 2×2 framework of achievement goal theory, which includes measures of approach and avoidance. Finally, the authors did not include behavioral measures, either as an intention or actual behavior. To fully understand the impact of the athletic ideal, sex, and achievement goals, health-related professionals may need to participate in experimental designs in scenarios or, more likely, observe students working with actual clients (i.e., during training sessions or therapy appointments).

In conclusion, in partial support of our hypotheses, the results of the study extend previous work (24) and inform exercise science/health professors, especially those who teach physiology-based content in their courses. Although some of the variables of interest were not significant predictors, the influence of sex, task orientation, and internalization of the ideal athletic body help to explain the biases these students may possess. Students may enter their programs of study socialized by society and sport, possess athletic body ideals, bias toward overweight individuals, and have high ego goals. It is recommended that professors analyze the content of their courses to see where content can be added that would address the complex etiology of obesity and weight management and situate weight and weight-related health within a socioecological framework that represents the multifaceted and interdependent factors that contribute to weight. Additionally, exercise science programs can promote socially just practices and educational approaches that call attention to weight-related stigma and bias, the negative health consequences related to such bias, and strategies for promoting safe and welcoming health and fitness environment for people of all sizes. This approach to understanding the complexities of body weight highlights the value of using a dynamic lens through which to study obesity and how psychological mechanisms underlying obesity bias may play a role in how future health professionals conceptualize and address obesity.

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DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

Author contributions: J.L. and P.R. performed experiments; J.L. and C.G. analyzed data; J.L., P.R., and C.G. interpreted results of experiments; J.L. and P.R. prepared figures; J.L. and P.R. drafted manuscript; J.L., P.R., and C.G. edited and revised manuscript; J.L., P.R., and C.G. approved final version of manuscript; P.R. and C.G. conception and design of research.

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