Body dissatisfaction, ideals, and identity in the development of disordered eating among adolescent ballet dancers

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Abstract

Objective. Little is known about how female adolescent ballet dancers—a group at high-risk for the development of body dissatisfaction and eating disorders—construct body ideals, and how their social identities interact with body ideals to confer risk for disordered eating. Using a novel body figure behavioral task, this study investigated (1) whether degree and valence of body dissatisfaction corresponded to severity of disordered eating thoughts and behaviors, and (2) how ballet identity corresponded with ideal body figure size among adolescent ballet dancers.

Method. Participants were 188 female ballet dancers ages 13–18 years who completed self-report measures of study constructs and the behavioral task.

Results. Piecewise linear models indicated that there were significant differences in disordered eating thoughts and behaviors between those whose ideal body figures were smaller, larger, or the same as their current perceived body figures ($p<.001$), with individuals desiring smaller bodies endorsing significantly more binge eating ($p=.01$) and purging ($p=.002$), and less muscle building ($p<.001$), than those desiring larger bodies. We also found that identifying more strongly as a ballet dancer was correlated with having a smaller ideal body size ($p=.017$).

Conclusions. Findings from this study suggest desire to achieve smaller body sizes is correlated with more severe disordered eating endorsement and stronger ballet identity. Instructors and clinicians may consider assessing the extent to which individuals identify as a ballet dancer as a risk factor for disordered eating and encourage adolescent dancers to build and nurture other identities beyond ballet.

Key Words: Body ideals, body dissatisfaction, identity, disordered eating, ballet dancers, adolescence

Eating disorders are severe mental disorders with mortality rates among the highest across all psychiatric illnesses (Arcelus et al., 2011; Fichter & Quadflieg, 2016; Herzog et al., 2000). Even those with subthreshold eating disorder experience marked distress and impairment, including malnutrition, social isolation, and premature mortality (Hart et al., 2020; Kärkkäinen et al., 2018; Le Grange et al., 2012). Thus, elucidating factors correlated with disordered eating across diagnostic and severity spectra is of critical importance.

Body dissatisfaction is both a risk factor and a symptom of eating disorders (Ackard & Peterson, 2001; Dantas et al., 2018; Jacobi et al., 2004; Striegel-Moore & Bulik, 2007), and refers to a discrepancy between one's current body versus their ideal body, discontent with specific features or parts of the body, and/or the desire to change weight or shape. Perhaps unsurprisingly, female adolescent ballet dancers have emerged as a high-risk group for the development of body dissatisfaction and subsequent eating disorders due to their enhanced focus on thinness, leanness, and body ideal achievement (Anderson et al., 2012; Engel, 2003; Nerini 2015). Serious athletic training tends to intensify during adolescence, a period of development during which disordered eating commonly onsets (Martinsen & Sundgot-Borgen, 2013; Volpe et al., 2016). As female adolescents experience puberty, the period of rapid physical, mental, and hormonal change may create dissonance as one's subjective body ideals and expectations are not updated in tandem with their body's development, which puts individuals at higher risk for disordered eating (Klump, 2013; O'Dea & Abraham, 1999). This developmental phenomenon, compounded with the strong body ideals imposed in ballet, becomes an alarming issue in relation to body dissatisfaction and eating pathology (Dantas et al., 2018; Pickard, 2013; Ritenburg, 2010). While lifetime prevalence estimates of eating disorders among adolescent females in the US hover around 3.8% (Merikangas et al., 2009; Udo & Grilo, 2018), eating disorders are

alarmingly more common in adolescent female ballet dancers, with conservative estimates ranging from 15.8% to more inclusive disordered eating measures projecting prevalence as high as 82.6% (Arcelus et al., 2014; Ringham et al., 2006).

Despite the well-established overarching link between body dissatisfaction and disordered eating, many key aspects of this relationship remain poorly understood. For instance, while some evidence suggests that adolescents with obesity and higher BMI endorse greater body dissatisfaction (Marshall & Harber, 1996; Tebar et al., 2020), other studies indicate that lower weight individuals express higher levels of thinness-related body dissatisfaction and disordered eating (Cortese et al., 2010; Özgen & Kısaç, 2009). These varied results highlight a discrepancy in the experience of body dissatisfaction that may depend on direction or *valence*—that is, whether an individual's dissatisfaction stems from a desire to have a smaller vs. bigger body size and figure. Prior research has not clearly parsed valence of body dissatisfaction, which may account for some of the discrepancies in these disparate findings.

Further, despite the ubiquity of exposure to thin body ideals in ballet, not all adolescent female ballet dancers develop disordered eating behaviors, suggesting the presence of potential moderators in this relationship. One factor that may explain why ballet-based body ideals do not impact all dancers equally may be identity. Given that group identification has a powerful influence on behavior, stronger identity as a ballet dancer may facilitate adoption of unhealthy standards, ideals, and behaviors. Individuals integrate the social norms established by a salient group (i.e., ballet dancers) into their self-concept (Hogg & Vaughan, 2002; Hornsey, 2008), and the salience of group identification can modulate the degree to which an individual ascribes to its norms (Forney & Ward, 2013; Liu et al., 2019). Interestingly, preliminary data among college students from various sport domains suggests that exercise identity, but not athletic identity, is

associated with disordered eating (Palermo & Rancourt, 2021). However, this prior work was limited by its reliance on generalized "athletic identity" rather than sport-specific identity. In addition, the role of athletic group identification on disordered eating may be particularly salient during adolescence, a period characterized by rapid and profound development of self-concept and sense of 'self' (Sebastian et al., 2008).

To address these gaps, this study examined the associations between ballet identity, body dissatisfaction, and disordered eating in the high-risk group of adolescent female ballet dancers, with three main aims. First, we aimed to compare endorsement and severity of disordered eating between adolescent dancers who wished to decrease vs. increase body figure size. We hypothesized that more extreme body dissatisfaction (operationalized as the difference between current body size and ideal body size) would be associated with greater severity of disordered eating thoughts and behaviors, with some components of disordered eating thoughts and behaviors differing across those who wished to decrease vs. increase body size. Specifically, we hypothesized that negative attitudes towards obesity would be less severe, and desire for muscle building more severe, among those who wished to increase body size. Second, we tested whether the extent to which participants identified as a ballet dancer was associated with ideal body figure size. We hypothesized that individuals who identified more strongly as a ballet dancer would report a smaller ideal body figure size.

Finally, regarding measurement of current and ideal body figure size, prior research has relied on the Stunkard Figure Rating Scale (Stunkard et al., 1983). This scale—and subsequent iterations—are highly abstract, blurry, and lack realistic body characteristics that may hinder accuracy in reporting one's body figure and ideals. These limitations motivated us to develop a novel comprehensive body figure measure including two female scales accounting for participant

skin tone and pubertal maturation stage (i.e., pre- to early and mid- to post-maturity figures), which we used to assess body figure ideals and body dissatisfaction. This scale was designed to account for the limitations of existing scales, with an additional focus on accessibility and inclusion regarding racial and ethnic diversity, physical developmental stage, and sex.

Method

Participants and Procedure

Participants were recruited to participate in this study (Discerning Attitudes towards Norms, Control, & Eating; D.A.N.C.E. Study) via social media accounts (Instagram, Facebook, TikTok) and a study website. Additionally, emails including the study information and a digital flyer were sent to over 175 ballet dance companies, studios, and academies across the nation displayed on Google Maps near urban areas in the United States with professional ballet companies (e.g., Atlanta, Boston, Chicago, Los Angeles, Miami, Nashville, New York, San Francisco). Interested participants completed a brief screener to assess study eligibility, including: (1) US residency, (2) 13–18 years of age, (3) cisgender, (4), comfort responding to questions about pubertal status and the body, and (5) pre-professional level of dance training. The third criterion was implemented as presenting body images that do not represent an individual's self-concept—and more specifically presenting body images to transgender, gender non-conforming, and non-cisgender individuals—can be potentially harmful or distressing (Fox et al., 2020). Given that the crux of this study depended upon presenting sexed body images to participants to collect information regarding body dissatisfaction, norms, etc., it was in the best interest of the participants to screen out anyone who did not identify as cisgender. The fifth criterion could be met one of four ways: (a) enrollment in term-time ballet classes for the 2019–2020 season, (b) enrollment in term-time ballet classes for the 2020–2021 season, (c) acceptance

to a 2020 summer intensive 3+ week ballet program, or (d) attendance at a 2020 summer intensive 3+ week ballet program.

Responses that met any of the following Qualtrics or internal study quality checks were considered potential spam, duplicate, or bot responses and were discarded: (1) reCAPTCHA value ≤ 0.3, (2) duplicate email address, (3) full survey completion response time < 350 s, (4) EPSI response time < 45 s, (5) birth month and year do not match reported age.[1] Additionally, (6) Relevant ID Fraud Score > 0 or empty cell, (7) Relevant ID Duplicate Score = "True", and (8) duplicate IP Addresses were flagged, checked for any global survey patterns, and discarded if such were present. Filler questions were also scanned for suspicious and/or duplicate responses. Participants who completed the full survey were compensated with a $5 online Amazon gift card. In addition, all individuals who completed the screener were entered into a raffle for $50–$100 online dance retailer gift cards.

Minimum sample size was calculated to be $N = 154$, which provided adequate power (.80) to detect small to medium effects ($f^2=.1$) with alpha $< .05$. Of the 998 completed screener responses, we screened out 628 responses based on failure to meet quality checks and 127 who completed the screener but did not meet inclusion criteria. Of 238 eligible participants, 188 completed the full survey and comprised the final analytic sample. The screener and study were both conducted online via Qualtrics. After completing the screening questionnaire, we provided all respondents with a list of mental health resources. Eligible participants were then directed to continue to the full study.

Measures

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[1] Survey timing tools were added part-way through data collection.

Eligibility and Demographics. The eligibility screener assessed US residency, sex, gender identification, age, birth month and year in addition to prompts regarding term-time ballet class enrollment and summer intensive programs. Participants were also asked whether they would be comfortable answering questions about puberty and examining body diagrams to preempt participation in the Tanner Stage Assessment (see *Comprehensive Body Figure Scale*). Four additional free response filler questions were placed throughout the screener to decrease likelihood of participants misrepresenting their eligibility to gain access to the survey. We also assessed several demographic characteristics, including race and ethnicity, grade level, state of residence, height, and weight.

Disordered Eating Thoughts and Behaviors. We assessed disordered eating endorsement and severity using the Eating Pathology Symptoms Inventory (EPSI; Forbush et al., 2013), a 45-item measure with 8 subscales assessing body dissatisfaction, binge eating, cognitive restraint, purging, restricting, excessive exercise, negative attitudes toward obesity, and muscle building. Participants respond to each item on a scale of 0: "Never", 1: "Rarely", 2: "Sometimes", 3: "Often", 4: "Very Often", and items are summed for each subscale. Of note, the EPSI Body Dissatisfaction subscale differs from the current study's main body dissatisfaction assessment via our Comprehensive Body Figure Scale. Whereas EPSI items assess general like or dislike of one's body (e.g., "I did not like how my body looked"), the Comprehensive Body Figure Scale provides more granular information on current body size, desired body size, degree of dissatisfaction, and direction of dissatisfaction (e.g., desiring a larger vs. smaller body size). Additionally, we included an expanded measure of dietary restriction assessing presence and frequency of restrictive episodes (Haynos & Fruzzetti, 2015).

Comprehensive Body Figure Scale. To measure ideal body image and body dissatisfaction, we developed the novel Characteristics integrating Race/Ethnicity, Sex, & Tanner stage (CREST) Body Scale (Ohashi, 2022) informed by the Stunkard Figure Rating Scale and subsequent versions, which have been previously used to measure body dissatisfaction (Marshall & Harber, 1996; Stunkard et al., 1983; Tebar et al., 2020). In the present study, we presented two versions of the CREST Body Scale for females in pre- to early pubertal maturation stages, and in mid- to post-pubertal maturation stages, respectively. Each scale includes 11 different figures ranging from severely underweight to overweight. There were 7 iterations of each scale ranging from light to dark skin tones with one plain version (i.e., no skin tone shading). Participants were prompted to select the skin tone that best matched their own, and those who did not provide a response were defaulted to the plain version of the scale. Participants then used the body figure scale to select which image best reflected their (1) current body figure and (2) their ideal figure. The metric of body dissatisfaction was calculated as the difference between the selected current body figure size and ideal body figure size. We used the Tanner Stage Assessment (Tanner, 1962; Morris & Udry, 1980) to determine pubertal development stage and administer the proper scale iteration. The Tanner Stage Assessment is a self-report questionnaire that addresses developmental status of secondary sex characteristics.

Strength of Ballet Identity. To measure how strongly participants identified as ballet dancers, we first primed them to consider their relevant social identities using an adapted CBT Pie Chart Task (Mendez, 2017). The goal of this task was to allow participants to identify various relevant identities that they hold. The task prompts participants to name their top identities (e.g., ballet dancer, student, sister, etc.) and rank the extent to which they identify with

each identity. The identity "Ballet dancer" was pre-filled as one of the identities, and an additional seven slots are provided to be used at the participant's discretion.

We then administered the Baller Identity Measurement Scale (BIMS; Harrison et al., 2010) to measure how strongly participants identified as a ballet dancer. This measure includes a five-point scale across 10 items along 4 subscales which assess social identity, exclusivity, positive affectivity, and negative affectivity, resulting in a global score. This scale pinpoints an individual's relationship to an athletic sport, switching out the term "baller" with the identifying terminology, which was "ballet dancer" in the present study.

Data Analysis

All analyses were conducted using R version 1.3.1093.[2] We first examined demographic characteristics of the sample and average Eating Pathology Symptoms Inventory (EPSI) subscale scores. Second, we calculated body dissatisfaction by taking the difference between current body figure size and ideal body figure size, as measured through the CREST Body Scale images. This resulted in both a degree (the severity of body dissatisfaction in relation to body satisfaction, a difference of zero) and valence (negative as the desire to decrease size, positive as the desire to increase size, and zero as no desired change) metric for each participant's body dissatisfaction. Third, we tested the association between degree of body dissatisfaction, as captured by the body figure scale, across all EPSI subscale scores. We conducted a Pearson's correlation test with the body dissatisfaction absolute scores. Absolute values were used to capture the degree of body dissatisfaction independently from the valence.

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[2] Packages include car (*v3*; Fox & Weisberg, 2019), ez (*v4.4-0*; Lawrence, 2016), lmerTest (Kuznetsova et al., 2017), lme4 (Bates et al., 2015), lubridate (Grolemund & Wickham, 2011), ggplot2 (Wickham, 2016), measurements (*v1.4.0;* Birk, 2019), patchwork (Pedersen, 2020), PAutilities (Hibbing, 2019), plyr (Wickham, 2011), pwr (*v1.3-0,* Champely, 2020), tidyr (*v1.1.2*; Wickham, 2020), stringr (*v1.4.0*; Wickham, 2019), tidyverse (Wickham et al., 2019), and zoo (Zeileis & Grothendieck, 2005).

Fourth, we conducted piecewise linear models to examine the influence of valence on the impact of degree of body dissatisfaction with each individual EPSI subscale. The models were constructed with a forced breakpoint at 0 (indicating body satisfaction with no desire to change body figure size) to delineate the natural division between participants with negative body dissatisfaction (desire to decrease body figure size) vs. positive body dissatisfaction (desire to increase body figure size). Given that the coefficients were each linear combinations of the effects, the standard error of the negative dissatisfaction leg of the piecewise linear model did not need to be adjusted. Since the positive dissatisfaction leg of the piecewise linear model was influenced by an adjusted prediction to account for the zero breakpoint, we calculated the positive dissatisfaction slope standard error using a covariance matrix.

Lastly, we examined Pearson's correlations between ballet identity score and ideal body figure size. We conducted a linear regression for ballet identity score with personal ideal body figure size. Overall, 0.0025% of data were missing and imputed with mean imputation.

Results

Participant Characteristics

A total of 188 female adolescent ballet dancers ages 13–18 years ($M = 16.14$, $SD = 1.48$) were included in the analyses. Participants were majority White ($n = 145$, 77.13%), which was representative of existing ballet industry demographics (Integrated Postsecondary Education Data System (IPEDS), 2017), and reported living across 34 states and the District of Columbia. Of note, 150 (79.79%) participants reported engaging in restrictive eating in the past year ($n = 111$, 59.0% in the past month with a median of 6.50 reported episodes). **Table 1** provides descriptive statistics for demographics and clinical characteristics.

Table 1: *Demographic and Clinical Characteristics*

	M (SD)	Range	*N (%)*
Age (years)	16.14 (1.48)	13.07–18.99	
Weight (lb)	119.3 (19.81)	80–190	
Height (in.)	64.53 (3.04)	51–76	
Body Mass Index (BMI)			
Exact percentiles	34.03 (27.2)	1–96	
Race			
White			145 (77.13)
Asian/Asian American			19 (10.11)
Black/African American			10 (5.32)
American Indian/Alaska Native			2 (1.06)
Mixed/Other			12 (6.38)
Ethnicity			
Hispanic/Latinx			17 (9.04)
Non-Hispanic/Latinx			171 (90.06)
Studio Type			
Academy affiliated with professional company			31 (16.49)
Competition dance studio			33 (17.55)
Dance boarding school			13 (6.91)
Performance dance studio (non-competitive)			95 (50.53)
Professional dance company			5 (2.66)
Other			11 (5.85)
Body Figure Scale: Body Dissatisfaction	-1.53 (1.74)	-7–4	
Negative (BD < 0)			144 (76.6)
Body Satisfaction (BD = 0)			28 (14.89)
Positive (BD > 0)			16 (8.51)
Eating Pathology Symptoms Inventory			
Body Dissatisfaction	17.24 (7.08)	1–28	
Binge Eating	12.49 (6.22)	0–32	
Cognitive Restraint	6.10 (3.04)	0–12	
Purging	4.67 (4.97)	0–19	
Restricting	10.59 (5.34)	0–23	
Excessive Exercise	11.48 (4.60)	2–20	

Negative Attitudes Towards Obesity	5.83 (5.04)	0–20
Muscle Building	4.44 (3.78)	0–15

Degree of Body Dissatisfaction and Disordered Eating Endorsement

Seven out of the eight EPSI subscales were significantly correlated with degree of body dissatisfaction, as measured by the absolute difference between current body figure size and ideal body figure size: EPSI Body Dissatisfaction ($r = 0.61$, $p < .0001$); Binge Eating ($r = 0.22$, $p =.002$); Cognitive Restraint ($r = 0.44$, $p < .0001$); Purging ($r = 0.20$, $p = .007$); Restricting ($r = 0.16$, $p = .026$); Excessive Exercise ($r = 0.31$, $p < .0001$); and Negative Attitudes Towards Obesity ($r = 0.17$, $p = .019$). Muscle Building was the only subscale for which scores were not significantly correlated with degree of body dissatisfaction ($r = 0.07$, $p = .32$). Muscle building was not significantly correlated with degree of body dissatisfaction.

Valence of Body Dissatisfaction and Disordered Eating Endorsement

Results from piecewise linear models are shown in **Table 2**. For participants with negative body dissatisfaction (desire to decrease body figure size), there was a positive and significant relationship across all EPSI subscales (with the exception of the Muscle Building subscale) and degree of body dissatisfaction (difference between present body figure size and ideal) (ps < 0.05). Among participants with positive dissatisfaction (desire to increase body figure size), there was a positive and significant relationship across all EPSI subscales (except for Binge Eating and Purging subscales) and degree of body dissatisfaction (ps < 0.05). Overall, five Eating Pathology Symptoms Inventory subscales demonstrated consistent increased endorsement in relation to degree of body dissatisfaction, regardless of positive or negative valence: Body Dissatisfaction, Cognitive Restraint, Restricting, Excessive Exercise, and

Negative Attitudes Towards Obesity. **Figure 1** illustrates the resulting relationship between

valence of body dissatisfaction with each EPSI subscale.

**Table 2:** *Body Dissatisfaction Valence & EPSI Subscale Endorsement*

EPSI Subscale	Estimate	*SE*	*t* value	*p* value
Body Dissatisfaction				
Negative BD	-3.17	0.29	-10.84	<.001***
Positive BD	1.45	0.69	2.01	.04*
Binge Eating				
Negative BD	-1.00	0.32	-3.08	.002**
Positive BD	0.90	0.76	1.13	.26
Cognitive Restraint				
Negative BD	-0.97	0.15	-6.59	<.001***
Positive BD	0.81	0.34	2.25	.03*
Purging				
Negative BD	-.68	0.26	-2.61	.01**
Positive BD	1.24	0.62	1.90	0.06
Restricting				
Negative BD	-0.56	0.27	-2.05	.04*
Positive BD	2.04	0.65	3.00	.003**
Excessive Exercise				
Negative BD	-1.01	0.24	-4.28	<.001***
Positive BD	1.50	0.63	2.60	.01**
Negative Attitudes Towards Obesity				
Negative BD	-0.58	0.26	-2.20	.03*
Positive BD	1.75	0.61	2.70	0.008**
Muscle Building				
Negative BD	-0.14	0.20	-0.72	0.47
Positive BD	1.64	0.46	3.41	<.001***

Note. The presence of significant linear relationships varied based on valence (negative versus positive) of body dissatisfaction for three Eating Pathology Symptoms Inventory subscales: Binge Eating, Purging, and Muscle Building. For each of these three relationships, degree of body dissatisfaction is related to severity of disordered eating score for either negative or positive body dissatisfaction participants, but not the other. Negative regression values for negative body

dissatisfaction suggest more extreme disordered eating the higher the degree of dissatisfaction (further from body satisfaction breakpoint, *psi* = 0).
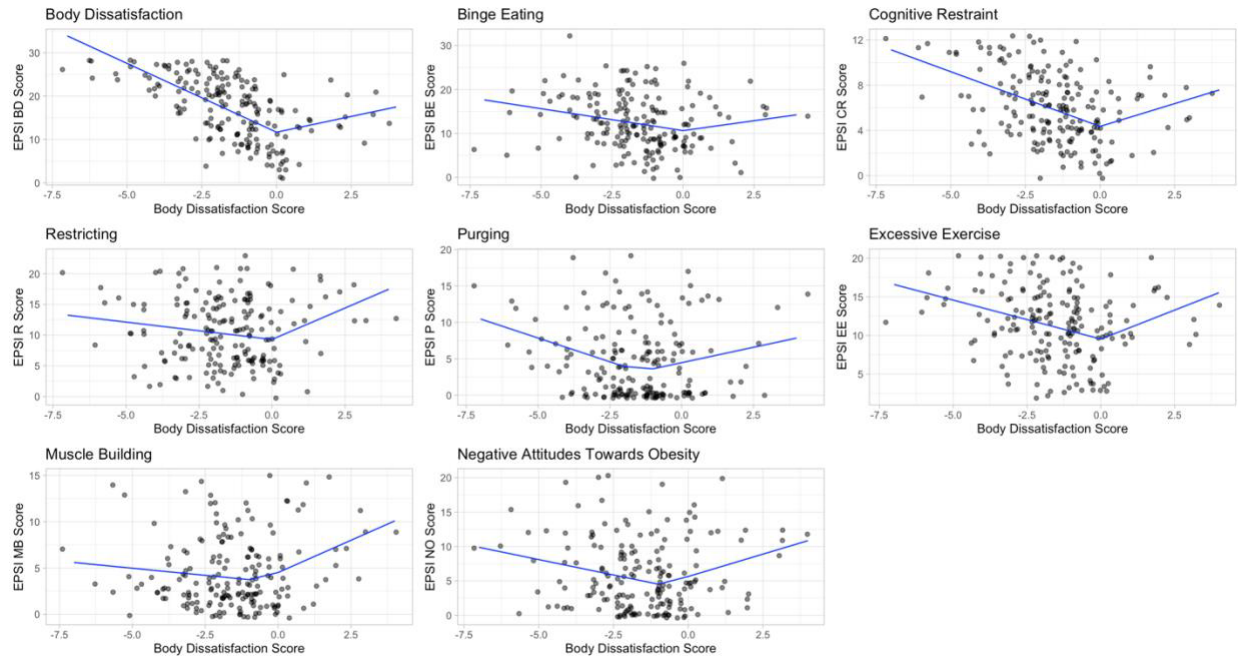
Figure 1: *Correlation between Degree of Body Dissatisfaction and Eating Pathology Symptoms Inventory Subscale Score*
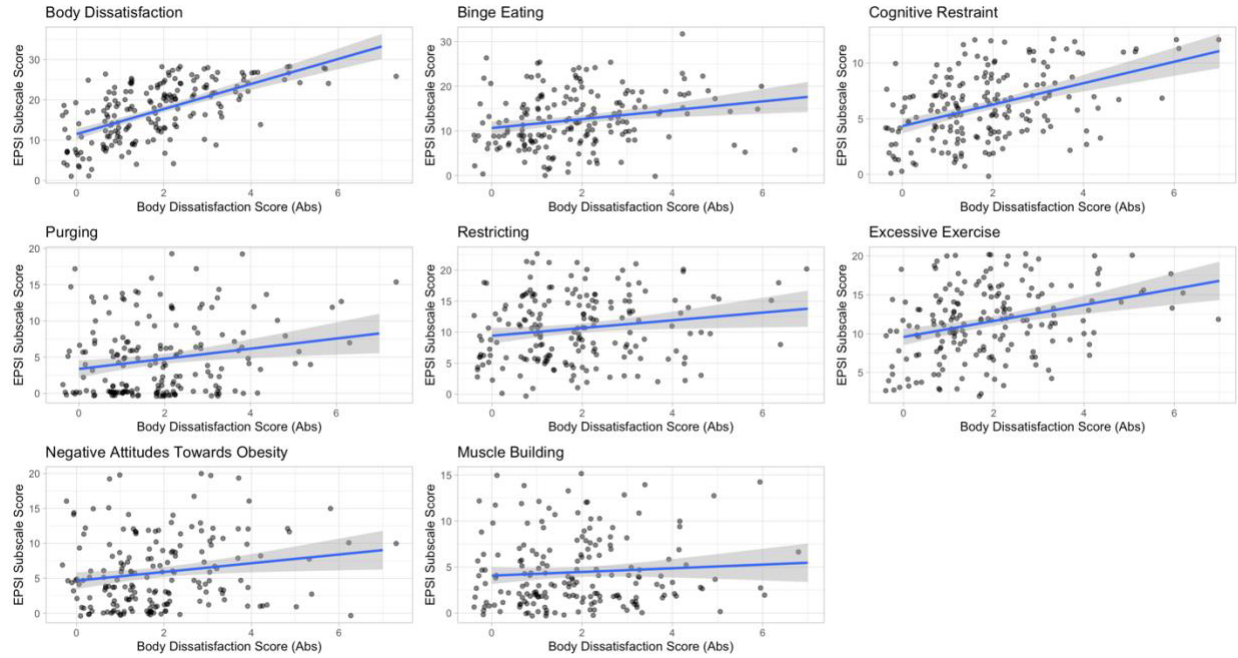
Figure 2: *Piecewise Linear Regression between Valence of Body Dissatisfaction and Eating Pathology Symptoms Inventory Subscale Score*

Piecewise linear regression model between valenced degree of body dissatisfaction (difference between current body figure size and ideal body figure size) and Eating Pathology Symptoms Inventory subscale scores. *Note.* EPSI score ranges vary across subscales based on the number of items designated. For each item, 0 indicates "Never" endorsing and 4: "Very Often". Our calculations used a forced breakpoint at 0 to indicate no desire to change body size, however, ggplot visualizations display optimized breakpoints based on regression fit. Plots for Purging, Muscle Building, and Negative Attitudes Towards Obesity subscales display non-zero breakpoints.

Strength of Ballet Identity and Ideal Body Figure Size

Across all participants, ballet identity was negatively correlated with ideal body figure size (r = -0.17, p = .017; **Figure 3**), suggesting that individuals who identified more strongly as a ballet dancer also tended to desire smaller bodies.

Figure 3: *Correlation between Ballet Identity and Ideal Body Figure Size*
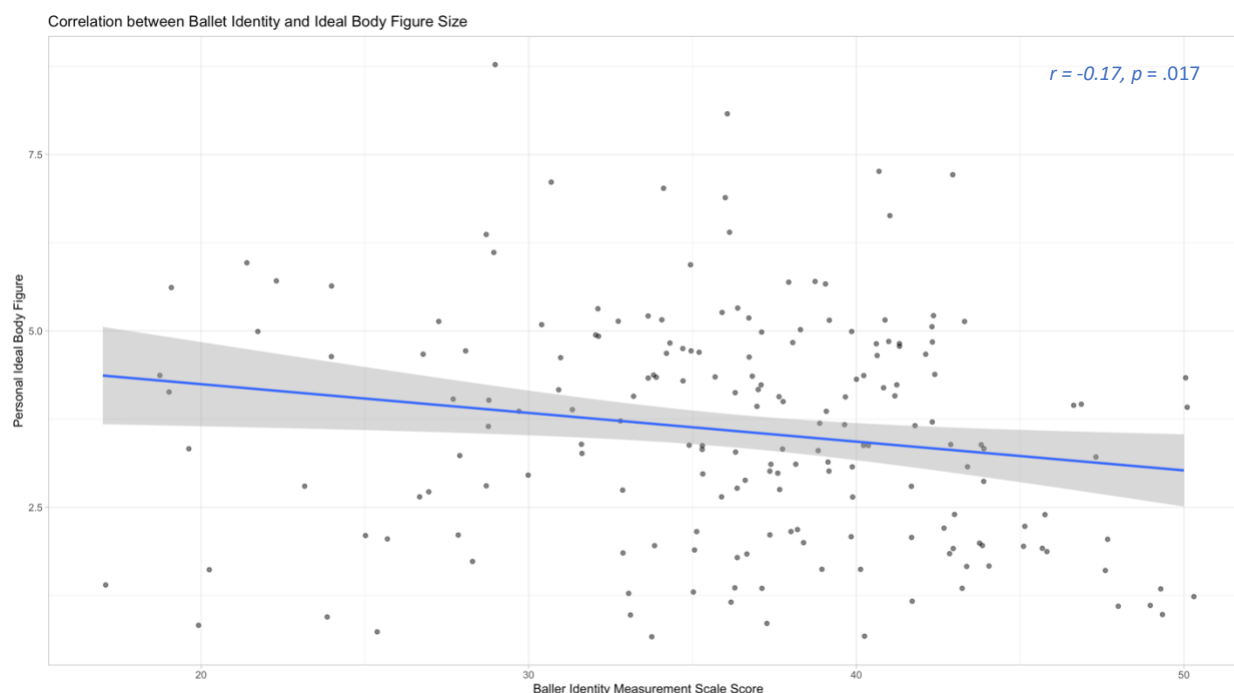
Correlation between Baller Identity Measurement Scale score (strength of identifying as a ballet dancer) and ideal body figure size. *Note*. BIMS scores range from 10 to 50 (1 indicating "Strongly Disagree" to 5 indicating "Strongly Agree" across 10 items). Ideal body size ranges from 1 (smallest) to 11 (largest).

Discussion

This study had two primary aims: to investigate the association between degree and valence of body dissatisfaction with severity of disordered eating, and to test whether ballet identity is associated with ideal body figure size. Findings demonstrated that degree of body dissatisfaction is positively associated with severity of disordered eating endorsement among adolescent ballet dancers, and that stronger ballet identity predicted smaller body image goals. Additionally, there were distinct differences in endorsement across disordered eating thoughts and behaviors between the negative and positive body dissatisfaction groups, suggesting that valence of body dissatisfaction, in addition to severity, is an important component in determining how this population engages in disordered eating. These findings extend the existing body of literature on the relation between body dissatisfaction and disordered eating (Arcelus et al., 2014;

Da Silva et al., 2016), and introduces the role that specific sports identity plays in how adolescent ballet dancers construct their personal body image goals.

Consistent with previous studies, we found that body dissatisfaction is strongly and positively associated with disordered eating among adolescent female ballet dancers (Ackard & Peterson, 2001; Dantas et al., 2018; Jacobi et al., 2004). As hypothesized, more extreme body dissatisfaction was correlated with greater severity of disordered eating thoughts and behaviors, regardless of whether an individual wanted to decrease their body figure size (negative body dissatisfaction) or increase their body figure size (positive body dissatisfaction). Thus, despite an assumption that those who wish to gain weight or increase body figure size may not be as concerning in comparison to those pursuing low-weight or thin ideals, adolescent ballet dancers who express any dissatisfaction with their bodies—and particularly those with more extreme desires for change—may be at marked risk for disordered eating.

Interestingly, there were distinct variations in endorsement between those with negative body dissatisfaction versus positive dissatisfaction. Namely, those who wished to decrease their size more extremely (higher degree of negative dissatisfaction) indicated more extreme severity in disordered eating endorsement across all behaviors except for the desire to build muscle. Among those who wanted to increase their body figure size more extremely (i.e., higher degree of positive body dissatisfaction), there was significant heightened severity in disordered eating endorsement across all behaviors except Binge Eating and Purging. One surprising finding was that degree of positive body dissatisfaction was significantly related to heightened Negative Attitudes Towards Obesity subscale scores. We originally hypothesized that participants who reported a more pronounced desire to increase body figure size would not express heightened negative attitudes towards obesity, given that the achievement of their ideal body figures would

inherently require weight gain and movement closer to the "obese" end of the body figure scale. Of note, it is likely among a sample of ballet dancers that those who desire to increase size tend to have a small current body figure at start, and their ideal figures are still far below what would be considered obese. Thus, we may observe the desire to increase size, or positive body dissatisfaction, and expressed negative attitudes towards obesity concurrently. Ultimately, these results indicate some significance in valence's association with disordered eating endorsement that suggests the nature of desiring to decrease, or increase, one's body figure size is related to the nature of the thought or behavior itself. Female adolescent ballet dancers with more pronounced body dissatisfaction may thus be at higher risk for the development of disordered eating, and the valence of this dissatisfaction may inform which thoughts and behaviors these individuals are at pronounced risk for facing.

Notably, findings from this study stand in contrast with recent findings suggesting that those with greater athletic and exercise identity are at a reduced risk for disordered eating (Palermero & Rancourt, 2021). Ballet dance, considered an aesthetic sport, was grouped within these findings, though grouping ballet with other non-aesthetic sports may have masked a potential positive association between athletic identity and disordered eating specific to this population. Distinctly, the current study deliberately selected a more specific measure of athletic identity—the Baller Identity Measurement Scale (BIMS; Harrison et al., 2014)—that centered one's ballet identity and analyzed its association with body image goals, rather than disordered eating directly. In capturing the influence that a relevant sport and the strength of identity tied to it has on the formation of body ideals, this takes into account how ideals inform whether an individual experiences body dissatisfaction. Furthermore, the degree and valence of body

dissatisfaction were associated with disordered eating among adolescent ballet dancers, indicating that body dissatisfaction may be important for subsequent disordered eating.

In addition, the present study provided a novel comprehensive body figure measure (CREST Body Scale; Ohashi, 2022) with a two female 11-figure scales. This scale was among the few, if any, to introduce variants of skin tone and pubertal maturation stage (pre- to early and mid- to post-maturity figures), which was a unique expansion of existing measures. This tool afforded the survey with the ability to customize the participant experience and tailor the images to resemble the participant more closely. We created a novel body figure scale with the intention to address limitations of existing scales on aspects of overall design, body figure size range and image quality (Lønnebotn et al., 2018; Stunkard et al., 1983; Thompson & Gray, 1995). The novel scale was also designed with a focus on accessibility and inclusion regarding skin tone, physical developmental stage, figure size, and sex. The lack of such personalization has long been noted as a limitation in other body-related stimuli—including skin tone for stimuli used to measure suicide and self-harm behaviors (Jaroszewski et al., 2020)—and thus our modifications could encourage greater engagement from individuals in using body figure scales to provide answers about their bodies.

Interestingly, extremity of EPSI body dissatisfaction subscale score was significantly related to participants with more severe negative body dissatisfaction, but the significance was less pronounced for those with positive dissatisfaction. This highlights the importance of more granular measurement of body dissatisfaction. Currently, many self-report measures of general "body dissatisfaction" may capture dissatisfaction more accurately for those who wish to decrease—vs. increase—their size, despite both forms of body dissatisfaction being important to capture and associated with disordered eating.

Limitations and Future Directions

We experienced several challenges during participant recruitment. Most notably, the COVID-19 pandemic prevented us from conducting on-site visits to summer intensive programs hosted by professional dance companies (e.g., Kansas City Ballet, Boston Ballet, New York City Ballet, etc.). This would have allowed for in-person recruitment, which would have reduced (if not fully eliminated) bot, spam, or repeat responses. However, the extensive response quality checks and filler questions maintained the legitimacy of the collected responses. Furthermore, we were able to offset in-person outreach limitations with augmented online recruitment spanning across social media platforms, reaching a large sample size with sufficient statistical power to detect effects of hypothesized relationships. In addition, direct recruitment from summer intensives would have guaranteed more homogeneity among the sample population. We thus expanded definitions of "pre-professional" level training in order to recruit an adequate sample size, which likely resulted in more variation within the sample. However, past studies have demonstrated that findings regarding body dissatisfaction or disordered eating may be generalized across athletic intensity level—e.g., elite versus non-elite or noncompetitive versus recreational athletes (Kong & Harris, 2014; Voelker et al., 2014). Thus, even with the loosened criteria for variables such as ballet training and skill level, the present findings demonstrate reliability and may further generalize to all members across the adolescent ballet community despite vast variations in personal experience. Another limitation of this study was that the final analyses only included female participants. We originally aimed to include both male and female adolescents training in ballet dance in the sample, but recruitment of male participants was limited despite focused advertising and outreach efforts.

Despite these challenges, the findings from the present study establish the presence of the hypothesized effects among a female adolescent ballet population, and consequent studies can use the present findings as a comparative sample in researching male populations, and we additionally developed a male body figure scale for such subsequent research. Additionally, although the present study's reflection of the ballet industry's White-dominated overall demographics (IPEDS, 2017), the sample has a lack of racial and ethnic diversity that may limit the generalizability of these findings across various individuals. To better reflect all ballet dancers' potential experiences, future studies should place an emphasis on recruiting and sampling more diverse groups of adolescent ballet dancers.

Given the variance in how individuals construct their perceptions of identity, another direction for future research could examine elements of the ballet environment (e.g., training discipline style, perceived competition, peer relationships) to better understand how personal ballet identity translates into ideal body goals. Past research on weight and body pressures within athletic samples have looked to coaches, teammates, uniforms, and environmental factors (Francisco et al., 2012; Kong & Harris, 2014; Reel et al., 2013). Thus, future research may consider exploring the body figure sizes of relevant peer groups (e.g., ballet peers, schoolmates) and how strongly an individual perceives their identity to be connected to that cohorts.

Conclusions and Implications

This study provides important insight on the association between degree and valence of body dissatisfaction and disordered eating severity among adolescent ballet dancers. In addition, this research provides preliminary insight regarding ballet identity's role in influencing personal body ideals, which can confer future risk for disordered eating. Previous research has suggested that adolescent, athletic, and ballet cohorts are at increased risk for the development of body

dissatisfaction and disordered eating (Anderson & Petrie, 2012; Martinsen & Sundgot-Borgen, 2013; Merikangas et al., 2009; Smink et al., 2012). This study extends this work by demonstrating that ballet identity and body ideals are important facets in informing and understanding this phenomenon. Moving forward, instructors and clinicians may consider assessing the extent to which individuals identify as a ballet dancer as a risk factor for disordered eating and take preemptive steps to combatting this trend. Emerging research has explored how adjusting exposure to certain body figure sizes influences the reported size of personal body ideals (Aniulis et al., 2020), which provides insight as to why and how adolescent ballet dancers may internalize unhealthy body standards, even in the face of nutritional and physical health education. These findings, alongside those of the present study, also stress the importance of encouraging adolescent dancers to build and nurture other identities beyond ballet. This strategy in building a healthy relationship between body and sport may aid the success of existing prevention programs tested among adolescent ballet cohorts (Piran, 1999) while drawing attention to our present failures to address the health of at-risk populations for body dissatisfaction and disordered eating.

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