Disordered Eating Attitudes and Behaviors in Ballet Students: Examination of Environmental and Individual Risk Factors

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ABSTRACT
Objective: The current study compared the prevalence of disordered eating attitudes and behaviors among adolescent ballet dancers at national, regional, and local schools.
Method: Female ballet students (N = 239; mean age = 15.0 ± 1.5 years) from five geographically disparate summer programs completed the Eating Disorder Inventory (EDI) and answered questions regarding eating disorder symptoms.
Results: Students from both national and local schools reported significantly higher EDI total, Drive for Thinness, and Perfectionism scores compared with regional students. In contrast, national students reported significantly greater dieting scores and lifetime histories of self-induced vomiting compared with regional and local students.
Conclusion: Eating pathology among adolescent ballet dancers may be a function of both genetic and environmental risk. Dancers who exhibit high levels of perfectionism and, perhaps consequently, place themselves in highly competitive environments, may exhibit a significantly increased risk for disordered eating in comparison to dancers who are less perfectionistic and/or place themselves in less competitive environments. © 2005 by Wiley Periodicals, Inc.

Keywords: ballet; dancers; adolescents; eating disorders

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Introduction
Adolescent ballet dancers are at significantly higher risk for the development of eating disorders than their nondancing peers (Abraham, 1996; Braisted, Mellin, Gong, & Irwin, 1985; Neumaker, Bettle, Neumarker, & Bettle, 2000). Although large epidemiologic studies estimate that the point prevalence of anorexia nervosa is approximately 0.28% among young women in general (Hoek, 2002), several smaller scale studies suggest that the point prevalence of anorexia nervosa among female ballet students ranges from 1.6% (Abraham, 1996) to 7.0% (Szmukler, Eislur, Gillies, & Hayward, 1985). Past research suggests that female ballet students weigh significantly less (Szmukler et al., 1985) and view unusually low body weights as more normal than nondancing high school students (Vaisman, Voet, Akivis, & Sive-Ner, 1996). In addition, female ballet students are less satisfied with their weight than their nondancing counterparts (Bettle, Bettle, Neumarker, & Neumarker, 2001) and often wish to lose weight despite a low body mass index (BMI; Bettle, Bettle, Neumarker, & Neumarker, 1998).

It is tempting to attribute these differences entirely to increased environmental pressure for thinness within the balletic context. Indeed, Lowenkopf and Vincent (1982) identified the dance community as “the most obsessively weight-conscious subculture in [the] country” (p. 55). However, Klump, Ringham, Marcus, and Kaye (2001) reported that female ballet students demonstrated a significantly higher family history of eating disorders compared with nondancing community controls, suggesting that genes that increase vulnerability for disordered eating may also enhance the likelihood of ballet school matriculation. Thus, there may exist a gene-environment correlation in which young women susceptible to the development of an eating disorder are more likely to
enter into a specific subculture, such as ballet, that values extraordinary thinness.

Importantly, despite heightened genetic vulnerability and environmental pressure, the majority of ballet students do not exhibit eating disorders. Thus, within this high-risk group itself, certain subgroups must be at greater risk than others. Garner and Garfinkel (1980) found that students studying at highly competitive ballet schools with an emphasis on preparing students for professional dance careers scored significantly higher on the Eating Attitudes Test (EAT) and exhibited a higher prevalence of anorexia nervosa than those studying at less competitive schools with a more academic and less professional focus. However, no study to date has investigated the possible relationship between school performing troupe affiliation and student eating pathology.

Ballet schools affiliated with professional nationally recognized performing troupes exist to prepare young dancers for professional dance careers. The atmosphere at these schools is particularly competitive, as students vie for limited spots in the classroom during national audition tours and onstage with elite professional dancers. Even after matriculation, young dancers who fail to show progress or begin to develop a nonideal body shape may be asked to leave to create openings at the school for students with greater promise. At one of the most elite ballet schools in the United States, the School of American Ballet, only 5% of the young dancers who matriculate at age 8 actually complete the training program at age 17 (Dunning, 1985). In contrast, ballet schools affiliated with regional professional ballet companies foster a less intense environment. Students may or may not be required to audition and are, therefore, less likely to be excluded due to lack of ability or overweight. Professional as well as recreational aspirations are entertained, and performing opportunities may be increased due to a smaller talent discrepancy between company members and students. Finally, the local dance school not affiliated with a professional performing troupe represents the least competitive site for ballet training. Such schools are nonexclusive, offer a primarily recreational curriculum, and, in the absence of a professional company, sponsor school recitals in which students may participate regardless of ability or weight.

The purpose of the current study was to assess whether ballet school affiliation with a national professional ballet company, regional professional ballet company, or no performing troupe would be associated with the level of disordered eating attitudes and behaviors of its students. A linear relationship between degree of competition due to company affiliation and level of disordered eating attitudes and behaviors was hypothesized, such that students attending schools affiliated with national ballet companies were expected to exhibit the greatest levels of disordered eating, followed by students at regional schools, with students at local schools exhibiting the least. Given that previous reports have identified both genetic and environmental contributions to eating disorder risk among dancers, it was understood that differences in eating pathology across school type could potentially result from two non-mutually exclusive sources. Specifically, such differences could be a function of the direct effects of school environment, and/or individual risk factors, such as perfectionism, that may increase the likelihood of attending a particular type of ballet school as well as increase the eating disorder risk.

Method

Participants

Female ballet students (N = 239) aged 13–18 years (M = 15.0, SD = 1.5) attending five geographically disparate summer ballet workshops throughout the United States participated in this study during July and August 2000. Two of these summer programs were affiliated with elite national professional ballet companies, two with smaller regional ballet companies, and one was a local school not affiliated with a performing troupe. No significant differences were found in age or ethnicity across school types. The sample was 86% White, 5% Black, 5% Asian, 2% Hispanic, and 2% American Indian/Alaskan Native.

Instrument

The survey was adapted from a preexisting instrument used in a study of eating disorders among college students (Heatherton, Nichols, Mahemedi, & Keel, 1995). The questionnaire included a 26-item version of the Eating Disorder Inventory (EDI; Garner, Olmsted, & Polivy, 1983) containing the Drive for Thinness, Bulimia, Perfectionism, Maturity Fears, and Interpersonal Distrust subscales. Students were also asked to note their current height and weight, rate their weight satisfaction, and state whether they wished to lose or gain weight. They were also asked to report whether they engaged in behaviors such as dieting, fasting, binge eating, self-induced vomiting, laxative use, or exercise outside of ballet class, and whether they believed they had an eating disorder (definite or possible).
The questionnaire also included items pertaining to the students’ dance training and goals. Students were asked to categorize the ballet school they attended during the academic year as affiliated with a national professional ballet company, a regional professional ballet company, or not affiliated with a performing troupe. Because the data were collected from students attending summer ballet workshops, many of which differed geographically and/or categorically from those they attended during the academic year, students were asked to indicate school type for the academic year, as it was assumed that their home schools would exert a greater influence on the variables of interest than their summer schools. Of the 239 participants, 26.3% \( (n = 63) \) attended national schools, 26.8% \( (n = 64) \) attended regional schools, 44.8% \( (n = 107) \) attended local schools, and 2.1% \( (n = 5) \) did not report their school type.

**Procedure**

The Committee for the Protection of Human Subjects at Dartmouth College approved the study design, survey instrument, and methodology. After permission was obtained from the principals of each of the summer programs, letters of consent were mailed to the parents of all students, most of whom were minors. Parents or guardians who did not wish their child to participate in the survey were invited to inform the investigators by mail so that their child could be excluded from the study. No parents chose to exclude their child. Approximately 80% of eligible students chose to participate. Dancers were assured that their results would remain confidential to school staff and parents.

This research was reviewed and approved by an institutional review board.

**Results**

Table 1 presents data on BMI, weight dissatisfaction, dieting, and EDI scores. Despite differences in school expectations, there were no significant differences in students’ BMI across school type. However, there was a trend-level difference in weight dissatisfaction and a significant difference in current dieting. Planned comparisons demonstrated that students at nationally affiliated schools reported significantly greater weight dissatisfaction and dieting compared with students at regionally affiliated schools. Although students at local schools were similar to regional students and significantly lower than national students in dieting, local students reported intermediate levels of weight dissatisfaction that did not differ from either national or regional students.

Total EDI scores differed significantly across school types as did scores on the Drive for Thinness and Perfectionism subscales. Both national and local students reported significantly higher EDI total, Drive for Thinness, and Perfectionism scores compared with regional students, but did not differ significantly from each other on these measures. EDI Bulimia, Maturity Fears, and Interpersonal Distrust subscales did not differ across school type.

**Self-Report Eating Disorder and Eating Disorder Symptoms**

Table 2 presents rates of self-reported eating disorders, both definite and possible, and rates of specific eating disorder symptoms. Rates of self-reported eating disorders differed significantly across school type. Nearly one third of students at schools affiliated with national professional ballet companies reported eating disorders, which was more than twice the rate reported at schools not affiliated with performing troupes. Schools affiliated with regional performing troupes had intermediate rates of eating disorders that did not differ significantly from those at nationally affiliated or unaffiliated schools.

There were no significant differences in rates of current eating disorder symptoms. However, there

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**TABLE 1.** Disordered eating attitudes and behaviors by school type

<table>
<thead>
<tr>
<th></th>
<th>National Schools ( n = 63 )</th>
<th>Regional Schools ( n = 64 )</th>
<th>Local Schools ( n = 107 )</th>
<th>Test Statistic ( df )</th>
<th>( p ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>18.26 ± 2.0a</td>
<td>17.79 ± 1.4a</td>
<td>18.04 ± 1.8a</td>
<td>( F(2, 228) = 1.10 )</td>
<td>NS</td>
</tr>
<tr>
<td>Weight dissatisfaction</td>
<td>3.2 ± 1.7a</td>
<td>2.6 ± 1.6b</td>
<td>2.8 ± 1.6ab</td>
<td>( F(2, 231) = 2.69 )</td>
<td>.070</td>
</tr>
<tr>
<td>Wish to lose weight</td>
<td>68.9%a</td>
<td>57.1%a</td>
<td>67.0%ab</td>
<td>( X^2 (2) = 2.28 )</td>
<td>NS</td>
</tr>
<tr>
<td>Dieting score</td>
<td>2.7 ± 1.3a</td>
<td>2.2 ± 1.2b</td>
<td>2.2 ± 1.1b</td>
<td>( F(2, 227) = 3.68 )</td>
<td>.027</td>
</tr>
<tr>
<td>Mean EDI score</td>
<td>81.9 ± 18.4a</td>
<td>72.1 ± 16.8b</td>
<td>78.5 ± 17.3a</td>
<td>( F(2, 229) = 5.15 )</td>
<td>.007</td>
</tr>
<tr>
<td>Drive for Thinness</td>
<td>18.8 ± 8.3a</td>
<td>13.8 ± 7.8a</td>
<td>16.3 ± 7.8a</td>
<td>( F(2, 229) = 6.23 )</td>
<td>.002</td>
</tr>
<tr>
<td>Bulimia</td>
<td>13.7 ± 5.7a</td>
<td>11.9 ± 5.4a</td>
<td>13.0 ± 5.3a</td>
<td>( F(2, 229) = 1.65 )</td>
<td>NS</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>23.6 ± 5.0a</td>
<td>20.7 ± 5.5b</td>
<td>22.8 ± 5.8a</td>
<td>( F(2, 229) = 4.58 )</td>
<td>.011</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>13.2 ± 3.8a</td>
<td>13.6 ± 3.2a</td>
<td>14.2 ± 3.6a</td>
<td>( F(2, 229) = 1.49 )</td>
<td>NS</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>12.7 ± 5.0a</td>
<td>12.1 ± 4.5a</td>
<td>12.3 ± 4.5a</td>
<td>( F(2, 229) = 0.27 )</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: Within each cell, the same superscript \( a, b, \) or \( c \) indicates that results of planned comparisons were not statistically significant \( p > .05 \). Different superscripts indicate statistical significance \( p < .05 \). Planned comparisons subsequent to analyses of variance (ANOVA) utilized Fisher’s protected least-squares difference (PLSD) to control for familywise error rate. BMI = body mass index; EDI = Eating Disorders Inventory; NS = not significant

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was a trend-level association between school type and current fasting. Planned comparisons demonstrated that fasting was significantly more common among students at nationally affiliated schools compared with students at local schools. Students at regional schools reported intermediate levels of fasting that did not differ significantly from rates at national or local schools.

Similar to patterns for current fasting, lifetime fasting also demonstrated a trend-level association with school type and planned comparison demonstrated that lifetime rates were significantly higher at national compared with local schools. In addition, lifetime self-induced vomiting differed significantly across school types. Self-induced vomiting was approximately three to four times more common among students at nationally affiliated schools compared with other students.

Conclusion

In the current study, adolescent ballet dancers attending schools affiliated with national, regional, or no professional ballet company differed significantly on disordered eating attitudes and behaviors. It is noteworthy that the results revealed two distinct patterns. First, on measures of disordered eating attitudes, such as the EDI Drive for Thinness and Perfectionism subscales, national and local students scored significantly higher than regional students. In contrast, on measures of disordered eating behaviors, including dieting and self-induced vomiting, national students scored significantly higher than regional and local students.

Our findings corroborate those of Garner and Garfinkel (1980) who reported that students studying at highly competitive ballet schools are more likely to exhibit disordered eating than those studying at less competitive schools. However, the current study expanded on the Garner and Garfinkel findings by assessing disordered eating among students attending local, nonprofessional caliber ballet schools. In the current sample, local students demonstrated disordered eating attitudes on par with their national counterparts and in excess of their regional peers. Indeed, the extent to which local students tended to look worse than regional students on the EDI was particularly remarkable given that local students are generally less technically advanced, have fewer performing opportunities, and ostensibly hold fewer professional aspirations than those at either the national or regional level.

The observed patterns of eating pathology across school type suggest that a combination of individual and environmental variables may mediate the phenotypic expression of eating disorders in this high-risk population. The current study was originally initiated to assess the potential effects of the ballet school environment on the disordered eating attitudes and behaviors of adolescent ballet students. However, differences in EDI Perfectionism scores across school type became salient in the course of the analyses and these were mirrored in differences for the EDI Drive for Thinness. Individuals with anorexia nervosa have been shown to exhibit greater perfectionism than healthy comparison subjects, with a positive correlation between perfectionism and eating disorder severity in the symptomatic group (Halmi et al., 2000). Further-
more, reports that high levels of perfectionism both prospectively predict (Tyrka, Waldran, Graber, & Brooks-Gunn, 2002) and persist after long-term recovery from anorexia nervosa (Srinivasagam et al., 1995) indicate that trait perfectionism is a probable contributor to the pathogenesis of disordered eating. Thus, within this high-risk group itself, it is possible that eating pathology varies as a function not only of external, school-imposed pressure for thinness, but also of an internal, student-imposed level of perfectionism. Specifically, national students, who exhibited high levels of perfectionism in addition to intense environmental pressure, also demonstrated high levels of both disordered eating attitudes and behaviors. It is possible that perfectionistic dancers are more likely to audition for prestigious, competitive schools that legitimize their own rigorous and exacting standards. Indeed, such students may even enjoy a greater chance of acceptance at such institutions to the extent that their personal standards do not actually diminish performance, as is sometimes the case in individuals exhibiting clinical perfectionism (Shafran, Cooper, & Fairburn, 2002).

In contrast to their national counterparts, regional students exhibited lower levels of perfectionism and experienced only moderate pressure for thinness, perhaps resulting in the lower levels of disordered eating attitudes and behaviors observed in the current study. Decreased levels of both internal and external pressure for thinness compared with the national group could be interpreted as protective factors for eating pathology among regional students.

Finally, local students, who demonstrated high levels of perfectionism but experienced relatively low pressure for thinness, exhibited elevated disordered eating attitudes that were seemingly inconsistent with their low levels of disordered eating behavior. These data suggest that, despite decreased external pressure for thinness at local schools, the local students themselves generated internal demands similar to those of their national peers. The unexpectedly high level of perfectionism among local students may be an artifact of the study design. The majority of intensive summer ballet programs are hosted by national and regional institutions, which boast the requisite teaching facilities and staff expertise. Of the five summer schools from which study participants were drawn, only one was a local institution. The majority of study participants were drawn from two national and two regional summer schools. It is possible that the local students in our sample represent the most competitive and perfectionistic students from their respective local academies.

Although the study design rendered the local sample less representative than originally planned, it ultimately illustrated a phenomenon of potential relevance to eating disorder risk in general: The effect of the environment when perfectionism is held constant. It is possible that high levels of perfectionism increase eating disorder risk above a certain baseline regardless of degree of environmental pressure, as illustrated by higher levels of drive for thinness exhibited in both the national and local groups. However, phenotypic expression of underlying risk may be enhanced in perfectionistic individuals who place themselves in competitive environments, as demonstrated by the national students exhibiting the highest level of eating pathology of all study groups. Once enrolled, external pressure for thinness may fuel preexisting internal pressure, resulting in a gene-environment correlation in which the competitive school environment enhances the expression of latent vulnerability for disordered eating in this group. In contrast, local students’ disordered eating attitudes may remain behaviorally inert in the absence of sufficient environmental pressure for thinness.

Of course, this interpretation is tentative, as the contribution of school-imposed pressure for thinness was inferred in this study rather than directly measured. Therefore, future prospective work is needed to determine the true magnitude of the environmental contribution within this paradigm. Given the cross-sectional nature of the current study, it is not possible to determine whether national school type is merely a proxy variable for a high level of perfectionism, or if heightened eating disorder risk in this group represents a true gene-environment correlation such that competitive school environment exacerbates a dormant genotype. However, the higher rate of current fasting in national students compared with their local peers does suggest at least some degree of environmental influence. Another potential limitation of the current study is that the findings were based on self-report rather than clinical interviews. However, recent research (Field, Barr Taylor, Celio, & Colditz, 2004; Keel, Crow, Davis, & Mitchell, 2002) suggests that self-report surveys can be both sensitive and accurate in the assessment of eating-disordered behaviors.

Despite its shortcomings, the current study also has strengths. This study employed a unique sample design. Although the study of disordered eating patterns among ballet dancers is not new, few reports have compared the prevalence of disordered eating attitudes and behaviors among the dancers themselves, contrasting them across variables specific to their dance training, rather than to control groups of
nondancers. Much of the literature consists of single-school or single-company studies with sample sizes of 50–100 participants. The current sample included 239 students attending five different dance institutions, each of which recruits dancers from a variety of feeder ballet schools throughout the nation, allowing the sample to include a wider and ostensibly more representative cross-section of the population of adolescent ballet dancers.

In conclusion, the results of the current study suggest that eating pathology among adolescent ballet dancers can be attributed to a combination of individual and environmental risk. Ballet students who exhibit high levels of perfectionism and, perhaps consequently, place themselves in highly competitive environments, exhibit a significantly increased risk for disordered eating in comparison to both dancers who are either less perfectionistic and/or place themselves in less competitive environments. Patterns observed in ballet dancers may provide a useful model for understanding risk in the general population. Of note, the low base rate of eating disorders in the general population encumbers the use of much-needed prospective designs (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004). Thus, ballet dancers, who carry greater individual vulnerability (Klump et al., 2001) and environmental vulnerability, might represent a promising population for modeling eating disorder risk factors in future longitudinal studies.

References


