



MODIFICATION OF THE COGNITIVE MODEL FOR BULIMIA VIA PATH ANALYSIS ON A BRAZILIAN ADOLESCENT SAMPLE

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Abstract — Eating disturbances in middle-class Brazilian adolescents attending three high schools (one Military, two Private schools) were investigated. Participants from both Private schools were similar to U.S. samples on the EAT-26. Path analysis on the Private schools revealed the following. Higher body weight leads to weight concerns most strongly through greater discrepancy from the ideal, but it also leads directly to weight concern. Thus, both the reality of being heavier and the perception that one is larger than ideal (which could be due to being heavier and/or having a thin ideal) contribute to weight concern. Greater weight concern is associated most directly with lower self-esteem, which in turn is associated with endorsing greater importance of weight and shape. Importance of weight and shape contributes most powerfully to eating pathology through dieting, but this variable has a modest direct effect as well. These paths were not significant for the Military school sample in which participants reported lower levels of weight concern, dieting, body dissatisfaction, and a larger ideal figure. However, the Military sample rated importance of weight and shape as high as did Private-school participants. The results provide support for variables identified as important in the cognitive model of bulimia and suggest the model may be enhanced by including body weight and one's perceived ideal body shape as additional variables. © 1998 Elsevier Science Ltd

It has become increasingly clear over the years that women's obsession with thinness is not restricted to Anglo populations. In fact, rates of disturbed eating attitudes and behaviors among U.S. Hispanic and Native American females have been shown to be similar to those reported for White samples (Crago, Shisslak, & Estes, 1996; Joiner & Kashubeck, 1996; Smith & Krejci, 1991; Story, French, Resnick, & Blum, 1995). A considerable degree of body dissatisfaction and problematic eating also has been reported among Black and Asian American women (Crago et al., 1996). Earlier research suggested that a high degree of acculturation was a primary factor associated with eating pathology among U.S. ethnic minority groups (Pumariega, 1986), but this has not been supported in recent studies with Mexican American (Joiner & Kashubeck, 1996; Lester & Petrie, 1995) and Asian American females (Yoshimura, 1995).

Given the findings suggesting that neither ethnicity nor degree of acculturation affects the prevalence of disturbed eating symptoms as strongly as initially thought, it is not surprising that substantial body image and eating problems have been reported for numerous samples of women outside of the United States. Studies have demonstrated this in Japan (Gustavson et al., 1993; Mukai, Crago, & Shisslak, 1994), Norway (Wichstrom, 1995), Costa Rica (Gustavson et al., 1993), China (Lee & Lee, 1996), and Egypt (Ford, Dolan, & Evans, 1990).

Brazil is a Third-World country we hypothesized would be of particular interest to study in terms of documenting degree of eating pathology. Brazil is reportedly at least 20 years behind most developed nations as far as women's equality and participation in the workforce. For most Brazilian women, attracting a partner and getting married

remains highly salient. Furthermore, the importance of thinness has recently been heavily promoted by the Western-influenced media. In response, fitness centers and laxative or diuretic abuse have become popular. Thus, several forces have placed considerable pressure on Brazilian women to look attractive and thin. At the same time, little information is available concerning health risks associated with excessive dieting and purging. Appropriate diagnosis of eating disorders and access to specialized treatment programs is extremely limited.

The earliest published work on eating disorders in Brazil appeared only 12 years ago. Case studies documented the existence of anorexia nervosa (Falceto et al., 1993; Santos, Yucif, Ferronato, Oliveira, & Santos, 1986), and an interview study located 25 Brazilian women with bulimia nervosa (Pope, Mangweth, Negrao, Hudson, & Cordas, 1994). Interestingly, the Brazilian participants with bulimia nervosa reported significantly greater maximum frequencies of weekly binges than did both the Americans and Austrians. The clinical characteristics of Brazilian females with eating disorders have also been described (Monteiro-dos-Santos, Yucif, Pilot-Pessa, & dos-Santos, 1988; Negrao & Cordas, 1996). To date, studies have not investigated the prevalence of eating and weight concerns in general-population samples.

The purpose of the present study was to gather prevalence estimates of disturbed eating attitudes and behaviors among Brazilian high school adolescents. This age group was selected because adolescence is the period during which many theorists believe that eating and weight concerns initially develop (Attie & Brooks-Gunn, 1989; Striegel-Moore, Silberstein, & Rodin, 1986). The dramatic bodily changes that occur during puberty and the added focus upon physical appearance through early dating have been shown to contribute to these concerns. The typical response is dieting (Attie & Brooks-Gunn, 1989; Galen, Levine, Smolak, & Murnen, 1990). In fact, between 44% and 56% of adolescent girls diet (Button, Loan, Davies, & Sonuga-Barke, 1997; Serdula et al., 1993), although many fewer develop eating disorders.

Various risk factors have been identified in prospective studies, most notably body dissatisfaction (Attie & Brooks-Gunn, 1989; Leon, Fulkerson, Perry, & Cudeck, 1993; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). Importantly, body-esteem is usually shown to be a major determinant of adolescent girls' general self-esteem (Button et al., 1997; Grant & Fodor, 1986). Thus, the current study included assessment of body dissatisfaction and self-esteem, as well as symptoms of eating pathology.

It was hypothesized that the rates of disturbed-eating attitudes and behaviors in a Brazilian sample would approach those reported for adolescents from developed countries. It was also hypothesized that heavier weight, the perception of being overweight, and body dissatisfaction would be shown to be pathways associated with increased dieting, bulimic behaviors, and weight preoccupation. Path analysis was used to test the contribution of variables identified by the cognitive model for bulimia, which hypothesizes that lower self-esteem and overconcern with shape or weight lead to strict dieting, which in turn leads to more severe eating pathology (Fairburn, Marcus, & Wilson, 1993). In addition, the study would provide data for Brazilian adolescents for several common eating-disorder instruments and preliminary psychometrics for Portuguese versions of the measures.

M E T H O D

Participants

Participants were 161 female students (mean age = 16.07 years) from three private high schools in Belo Horizonte, Brazil, an inland city of three million people. Subjects

were recruited from a Military school ($n = 33$) and two individual private schools (Private 1, $n = 58$) and (Private 2, $n = 70$). The majority of the students were from middle-class families. However, students in the Military school were from a lower-middle-class background by Brazilian standards, with an average monthly family income of \$700 to \$1,000. The Military students were all on scholarship, while a high tuition (approximately \$400 per month) was required for attendance at Private 1 and 2 schools. Students in these two non-Military schools were from middle-upper to upper-class backgrounds, with monthly family incomes of about \$10,000 to \$15,000.

Measures

The Eating Attitudes Test. The 26-item Eating Attitudes Test (EAT; Garner, Olmsted, Bohr, & Garfinkel, 1982) has been translated into several languages for cross-cultural research. The Portuguese version of the EAT, the ANEXO (Nunes et al., 1994), measures disturbance in eating attitudes and behaviors. The EAT has been found to distinguish eating-disorder groups (anorexia nervosa, bulimia nervosa, and binge-eating disorder) from nonclinical controls (Gross, Rosen, Leitenberg, & Willmuth, 1986; Prather & Williamson, 1988), and has been widely used with adolescents (e.g., Rosen, Compas, & Tacy, 1993; Whitaker et al., 1989). Items are answered on a 6-point Likert scale (1 = *never*; 6 = *always*) Factor analysis revealed three factors: dieting, bulimia and food preoccupation, and oral control. Adequate internal consistency (coefficient alpha = .94) and test-retest reliability ($r = .84$) have been demonstrated (Carter & Moss, 1984). The recommended cutoff score of 20 was used to indicate clinically significant symptom levels (Garner & Garfinkel, 1979).

The Body Esteem Scale. The Body Esteem Scale (BES) is a 35-item self-report instrument designed to measure the cognitive component of body esteem. Responses are made on a 5-point Likert scale, with 1 being *I have a very strong negative concept* and 5 being *I have a very strong positive concept*. Higher scores indicate greater body esteem. Adequate reliability of the BES with females ($r = .78-.87$) has been demonstrated. Factor analysis on females yielded three factors: sexual attractiveness, weight concern, and physical concern (Franzoi & Shields, 1984). Factor 2 (weight concern) was the primary variable of interest for this study.

The Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979) is the most widely used measure of global self-esteem with adolescents (Button et al., 1997; Franzoi & Shields, 1984). This self-report instrument is comprised of 10 items on a 4-point Likert scale, with responses ranging from *strongly agree* to *strongly disagree*. Higher scores indicate greater self-esteem. Adequate reliability has been demonstrated (Coefficient alpha = .85), and convergent and discriminant validity data have shown the RSE to be one of the most valid measures of global self-esteem (Byrne, 1983).

The Figure Rating Scale. The Figure Rating Scale (FRS; Stunkard, Sorensen, & Schulsinger, 1983), a self-report measure of body image widely used with adolescents (Sherman, Iacono, & Donnelly, 1994), presents nine female and male figures that vary in size from underweight to overweight. Participants are asked to select which figure best represents their current size and shape, their ideal, their mother's and father's current size, the figure they feel is most attractive for females, and the figure they believe males find most attractive. Responses are scored on a 9-point scale (1 = *thinnest*

figure). Adequate test-retest reliability has been demonstrated ($r = .89-.92$) (Thompson & Altabe, 1991), as well as high interrater agreement ($r = .79-.89$) (Mueller, Joos, & Schull, 1985). The instrument's minimal reliance upon verbal instructions makes it an ideal choice for a non-English-speaking population.

Additional questions. The following question was adapted from the Eating Disorder Examination (EDE; Cooper & Fairburn, 1987) to assess overconcern with weight/shape: *How important is your weight and body shape in determining how you feel about yourself as a person?* Participants respond on a 5-point Likert scale, with 0 being *no importance at all* and 4 being *it's extremely important*.

Several additional questions were taken from Brownell's Consumer Reports Weight Survey (Striegel-Moore, Wilfley, Caldwell, Needham, & Brownell, 1996). Participants were asked to report their height, weight, and whether or not they were currently trying to lose weight. Body mass index ($BMI = kg/m^2$) was calculated using self-reported height and weight.

Procedure

The ANEXO was the only screening instrument available in Portuguese. The remaining questionnaires were back-translated by two Brazilian-certified English translators. Items of the Portuguese versions were carefully compared with their English equivalent to ensure that the Portuguese translation retained the exact meaning of each item. Four bilingual individuals independently verified both the English and Portuguese versions of the measures for linguistic equivalence, conceptual equivalence, and scale equivalence (Marsella, 1987).

Teachers of classes chosen at random by the school directors were asked if their students could participate in the study, and none declined. Participants were asked to fill out questionnaires in their classroom for an American study on eating behaviors and body image in Brazilian adolescents. Directions for completing the surveys were written on the forms. Additionally, proctors emphasized confidentiality as they asked participants to complete the questionnaires on their own as honestly as possible. Participants were told to turn the forms in blank if they chose not to participate (2 students [.01% of the sample] did so).

R E S U L T S

School differences

Means and standard deviations for all variables by school are reported in Table 1. Significant differences across schools were found for age, so the remaining analyses on variables relevant to eating concerns were done with age as a covariate (see Table 1).

Analysis of covariance (ANCOVA) on BMI showed no significant school differences. Both Private 1 and Private 2 students scored significantly higher on the total EAT-26 than did the Military school students, $F(1, 159) = 7.5, p < .01$. As far as scores falling above the clinically significant level on the total EAT-26, 6.3% of the Military sample met the criterion, compared to 15.5% of the Private 1 group, and 13.5% of the Private 2 group.

Analyzing by separate factors, both Private schools scored significantly higher than the Military school on Factor 1 (dieting), $F(1, 159) = 9.7, p < .005$, but the schools did not differ on Factors 2 or 3. Both Private schools reported significantly higher levels of Weight Concern on the Body Esteem Scale (Factor 2) $F(1, 162) = 11.8, p < .0005$, and

lower levels of general self-esteem (RSE) $F(1, 162) = 4.1, p < .05$, than did the Military school. Interestingly, there were no school differences on the Eating Disorder Examination (EDE) item regarding the Importance of Weight and Shape.

Overall, the two Private schools were quite similar to each other and different from the Military school in terms of weight concern and dieting. More severe eating pathology was fairly low in both samples. Despite rating Importance of Weight and Shape just as high as the Private school participants, the Military participants reported less weight dissatisfaction and dieting. An examination of the means for the Figure Rating Scale helps to clarify this picture. Military participants endorsed a less thin ideal shape, resulting in a smaller discrepancy between Current and Ideal size that was associated with less body dissatisfaction. In contrast, Private school participants chose thinner Ideals, leading to a larger discrepancy from Actual size. In addition, Private school participants also selected a female figure they believed most men would find ideal (Men-Women) that was significantly smaller than what Military participants selected $F(1, 162) = 14.34, p < .0005$. Thus, for the path analysis, the Private schools were analyzed as a separate sample from the Military school.

Correlations among variables

Most of the variables relevant to eating and weight concerns were moderately correlated with each other (see Table 2). All variables were correlated with EAT-26 Factor 1 (Dieting), and all but BMI were correlated with EAT-26 Factor 2 (Bulimia and Food Preoccupation) (see Table 2). Notably, the Eating Disorder Examination (EDE) item (Importance of Weight and Shape) was not correlated with Weight Concern or Difference between Actual and Ideal Figure. BMI was not correlated with self-esteem (RSE) or Importance of Weight and Shape. In addition, as a check for the validity of

Table 1. Comparison of three schools on demographic variables and measures of eating pathology and body concern

Variable	Military (<i>n</i> = 33)		Private 1 (<i>n</i> = 58)		Private 2 (<i>n</i> = 70)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	15.97	1.5	15.50	0.8	16.59	0.8
BMI	19.40	1.8	19.98	2.0	21.07	2.8
Total EAT-26*	8.06	6.7	12.10	8.5	12.46	8.0
EAT1* (Dieting)	4.12	3.7	7.91	6.9	8.21	7.2
EAT-2 (Bulimia & food preoccupation)	0.39	1.0	0.81	0.8	0.97	1.7
EAT-3 (oral control)	3.54	3.6	3.37	3.3	3.27	3.3
BES Total*	118.45	13.7	109.47	15.1	110.06	17.4
BES-2* (Weight concern)	36.70	6.3	32.86	6.7	30.67	8.5
Men-Women*	3.25	0.9	2.82	0.7	3.00	0.7
Rosenberg* (RSE)	31.88	3.5	29.57	4.3	30.82	4.7
EDE Items						
Importance of Weight & Shape	2.64	1.1	2.64	0.9	2.56	0.9
Figure Rating Scale						
Difference between actual & ideal figure*	-0.09	0.9	0.42	0.8	0.78	0.9
Actual figure	2.94	0.8	3.10	0.8	3.64	1.0
Ideal figure*	3.03	0.7	2.70	0.6	2.88	0.7

*With Age as a covariate, school differences between the Military and Private schools were found at the $p = .05$ level

Table 2. Correlation Matrix

	Difference (ideal - actual) (FRS)	Weight Concern (BES-2)	Importance of Weight & Shape (EDE)	EAT1	EAT2	RSE
BMI	0.62****	-0.46****	-0.03	0.29****	0.09	-0.05
Difference (FRS) (Ideal - Actual)	—	-0.49****	0.002	0.40****	0.31****	-0.19*
Weight Concern (BES2)		—	-0.02	-0.38****	-.21**	-0.39****
Importance of Weight & Shape (EDE)			—	0.40****	0.31****	-0.19*
EAT1 (dieting)				—	0.45****	-0.31****
EAT2 (Bulimia & food preoccupation)					—	-0.23**

Note: * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0005$.

the EAT-26 Factor 1 (Dieting), Brownell's Consumer Reports Survey item that specifically asked participants if they were currently trying to lose weight was correlated with this factor; $r = 0.66$, $p < .0001$.

Path analysis

Path analysis was estimated through multiple regression analyses where variables later in the model were regressed on those earlier in the model. Standardized beta weights were used as estimates of the path coefficients. Ultimately, in the proposed model (see Fig. 1) there are two dependent variables: Dieting (EAT-26 Factor 1) and the measure of more severe eating pathology, Bulimia and Food Preoccupation (EAT-26 Factor 2). Nonsignificant paths are not shown on Figure 1. Significant paths represent the beta associated with the variable to the left of each arrow *controlling for* all prior variables.

The proposed path analysis model was run separately for the Military sample ($n = 33$), and the pattern found in the Private schools failed to emerge. Consequently, what follows is the succession of regressions and the results found for the Private schools. The Difference between actual and Ideal Shape (FRS) was regressed on BMI, $F(1, 123) = 68.1$, $r^2 = .36$, $p < .0001$. The beta reported in Figure 1 was significant. Weight Concern (BES subscale 2) was regressed on both Difference between Actual and Ideal Shape and BMI, $F(2, 122) = 27.3$, $r^2 = .31$, $p < .0001$, and the betas for both variables were significant.

Global Self-esteem (Rosenberg) was regressed on Weight Concern, Difference between Actual and Ideal Shape, and BMI, $F(3, 121) = 8.4$, $r^2 = .17$, $p < .0001$, with Weight Concern being the only significant path. Importance of Weight and Shape (EDE) was regressed on Global Self-esteem, Weight Concern, Difference between Actual and Ideal Shape, and BMI, $F(4, 120) = 2.7$, $r^2 = .08$, $p < .05$, with Global Self-esteem being the only significant path. Dieting (EAT-26 Factor 1) was regressed on Importance of Weight and Shape, Global Self-esteem, Weight Concern, Difference between Actual and Ideal Shape, and BMI, $F(5, 119) = 16.4$, $r^2 = .41$, $p < .0001$, with Importance of Weight and Shape being the only significant path.

Finally, EAT-26 Factor 2 (Bulimia and Food Preoccupation) was regressed on Dieting, Importance of Weight and Shape, Global Self-esteem, Weight Concern, Differ-

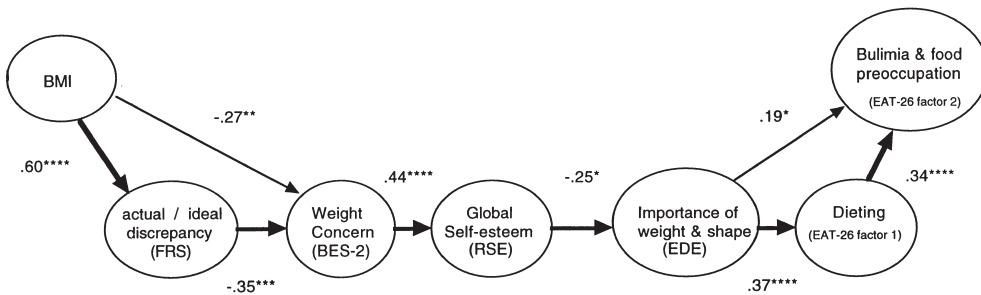


Fig. 1. Path diagram of proposed model of dieting and eating pathology for Private schools ($*p < .05$. $**p < .01$. $***p < .001$. $****p < .0001$).

ence between Actual and Ideal Shape, and BMI, $F(6, 118) = 6.7$, $r^2 = .25$, $p < .0001$, with Dieting and Importance of Weight and Shape being the only significant paths.

The variables in the model (Fig. 1) were ordered to examine the direct relation between the independent variables and the dependent variable, Dieting (EAT-26 Factor 1). Also, the direct relation between Dieting and EAT-26 Factor 2 (Bulimia and Food Preoccupation) was examined. Importance of Weight and Shape demonstrated an indirect or secondary path to EAT-26 Factor 2 as well, but it was less significant than the direct path from EAT-26 Factor 1 to EAT-26 Factor 2. Only one other indirect path was observed; BMI correlated highly with reported Difference between Actual and Ideal Shape ($r = .60$, $p < .00001$), and it also correlated directly with Weight Concern to a lesser degree ($r = -0.27$, $p < .001$). Except for these two digressions in the proposed model, a strong linear model emerged from the path analysis, with all paths reaching significance.

DISCUSSION

The present results provide normative prevalence rates for eating and weight concerns among Brazilian adolescent females. Using EAT-26 scores, the level of disordered eating for middle- to upper-class adolescents in two Private schools was similar to that found in other U.S. studies (Joiner & Kashubeck, 1996; Rosen et al., 1993). Although the mean EAT-26 score for the Military school was significantly lower, it was similar to studies done on adolescents in Britain (Button, Sonuga-Barke, Davies & Thompson, 1996), Hong Kong (Lee & Lee, 1996), and an earlier U.S. study (Grant & Fodor, 1986). Thus, disordered eating in the upper middle-class of this Third-World country is not rare and approaches U.S. levels in middle-class populations.

One of the differences found between the Military and the Private schools was that the Military participants chose larger ideals, and so this may be the main reason they reported less body dissatisfaction and less dieting. School differences partially may be due to a discrepancy in socioeconomic status (SES). Military participants were scholarship students, most of whom were from a somewhat lower middle-class background than were the Private-school participants. However, as recent U.S. studies have not found SES to be a significant predictor of pathological eating behaviors (Rogers, Resnick, Mitchell, & Blum, 1997; Story et al., 1995), other explanations must be considered. Because the degree of exposure to Westernized media images is likely equivalent for students across the three schools, the school differences may instead reflect

the distinct subculture of the Military atmosphere. Students in Military schools wear uniforms as opposed to fashionable clothing, mealtimes are very structured, and exercise is emphasized. Additionally, as at least one parent is enlisted Military, the Military subculture may well persist at home. Thus, the lower prevalence of eating and weight concerns in the Military school likely reflects the diminished focus on popular fashion standards (larger ideal shape) and the fitness focus (thinner actual shape) rather than SES discrepancies. Research with lower SES adolescents in a Brazilian non-Military school is needed to clarify the role of SES in disordered eating behaviors in Brazil.

Both Brazilian samples reported greater dissatisfaction on the Body Esteem Scale subscale 2 (Weight Concern) than a U.S. adult sample with its average score of 46.8 (Irving, 1990), but the Private schools reported even greater weight concern than the Military school. Although the implication is that Brazilian adolescents in this sample have even greater weight concerns than those of U.S. participants, U.S. adolescent norms on this instrument are unavailable for comparison purposes. On the Figure Rating Scale, Private-school participants' Ideal was thinner than that of the Military participants', resulting in Difference scores for the Private participants that fell within the range of prior U.S. studies, while the Difference for Military was considerably lower. As has been found previously in the literature (e.g., Fallon & Rozin, 1985), females in both samples in the current study selected an Ideal figure that was even thinner than the figure they thought males would find most attractive.

Path analysis on the Private schools revealed the following. Higher body weight leads to weight concerns most strongly through greater discrepancy from Ideal, but it also leads directly to weight concern. Thus, both the reality of being heavier and the perception that one is larger than Ideal (which could be due to being heavier and/or having a thin ideal) contribute to weight concern. Greater weight concern is associated most directly with lower self-esteem, which in turn is associated with endorsing greater Importance of Weight and Shape. Importance of Weight and Shape contributes most powerfully to eating pathology through dieting, but this variable has a modest direct effect as well. These paths were not significant for the Military-school sample in which participants reported lower levels of weight concern, dieting, body dissatisfaction, and a larger Ideal figure. However, the Military sample rated Importance of Weight and Shape as high as did the Private-school participants. Other studies also have found similar associations among the eating variables (Attie & Brooks-Gunn, 1989; Leon et al., 1993; Mukai et al., 1994) and have demonstrated an association between low self-esteem and disturbed eating (Button et al., 1996; Grant & Fodor, 1986; Joiner & Kashubeck, 1996).

The significant paths in this model suggest that weight-related and cognitive factors both mediate dieting behaviors. Furthermore, the model confirms that dieting is the strongest direct path to more pathological eating behaviors. The results lend solid support to the cognitive model of bulimia, in which low self-esteem and Importance of Weight and Shape are the primary variables hypothesized to lead to dieting, which then leads to bulimic behavior. Other studies have reported that poor body image pre-dates dieting, which leads to the bulimic syndrome (Thompson, Coovert, Richards, Johnson, & Cattarin, 1995), and that frequent dieting is a risk factor for further eating problems (French, Perry, Leon, & Fulkerson, 1995). In particular, the present study highlights the role of Importance of Weight and Shape. This variable appears to contribute new information not tapped by the other predictor variables (as it is not correlated with them). Results suggest that the cognitive model may be enhanced by including body weight and the thin ideal as additional variables in the model.

Validity of the newly translated measures is an important issue. Participants' responses to the Brownell Consumer Reports Survey item, which asked them if they were currently trying to lose weight, correlated highly with the EAT-26 dieting subscale, thus supporting the validity of the EAT-26 in this Brazilian population. Furthermore, means and correlations between factors on the EAT and BES factors' scores are similar to those found in U.S. samples, suggesting that the subscales are assessing similar constructs.

Limitations of this study include the exclusive use of self-report measures and the reliance upon classroom settings for administration. Participants were guaranteed confidentiality, but it is possible that some individuals may have been less candid due to the group setting. Another limitation of this study is that it did not include a low SES Brazilian sample, and the only low-middle-class group was Military. Although SES was not the main focus of the study, future designs that include suitable comparison groups would help to clarify the role of SES as a risk factor for eating disorders in Brazil. Finally, the present study sampled only subjects from inland Brazil. One might expect an even more pronounced emphasis on thinness in coastal cities such as Rio de Janeiro, which cultivate year-round "skimpy" fashions.

Recent media images in Brazil of the ideal female form indicate a marked shift from the thin but pear-shaped figure toward the taller, leaner, busty and narrow-hipped ideal popularized in many industrialized nations. Additionally, economic progress in Brazil has cultivated a burgeoning middle class that has more disposable income and a greater availability of fatty foods. The recent fad among adolescents in Brazil is to frequent American fast-food franchises that have opened in the nation's largest cities, adding to existing food and body image pressures.

With more than 20% of the Military participants and almost 50% of the Private-school participants reporting they are currently dieting, it is clear that early education is needed to ensure that healthful lifestyle practices are learned at a young age. The need for proper education is especially important in Brazil, a country where dieting myths and chicanery are commonplace, and federal regulation of unsubstantiated claims for diet products and pharmaceuticals is nonexistent.

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