



Predictors of Body Appreciation in Brazilian Girls Aged From Nine to 14 Years

Tatiane Possani¹ 

Maria Fernanda Laus^{1,2} 

Wigna Gabriella da Silva Alves¹ 

Sandra Torres³ 

Sebastião Sousa Almeida¹ 

Abstract: Social pressure toward a certain body standard harms well-being and can lead to psychological distress in adolescent girls. This study investigated self-esteem, eating behavior, age, and body mass index as predictors of body appreciation in 222 Brazilian girls ($M = 11.60$, $SD = 1.63$) who responded to the Body Appreciation Scale, the Rosenberg Self-Esteem Scale, and the Children's Eating Attitudes Test. Self-esteem, body mass index and age accounted for 52% of the variance in body appreciation and self-esteem emerged as the strongest predictor in the hierarchical linear regression analysis. The greater the age and body mass index, the lower the body appreciation in the evaluated girls. Finally, girls who showed lower body appreciation had higher disordered eating attitudes. This study brings new findings about body appreciation in Brazilian girls, especially that body appreciation tends to decrease during the transition from childhood to adolescence.

Keywords: adolescent, body image, self-esteem, eating behavior, Brazil

Preditores de Apreciação Corporal em Meninas Brasileiras de 9 a 14 Anos

Resumo: A pressão social para alcançar um determinado padrão corporal é prejudicial ao bem-estar e pode levar ao sofrimento psíquico de meninas adolescentes. Este estudo teve como objetivo investigar a autoestima, comportamento alimentar, idade e índice de massa corporal como preditores da apreciação corporal de 222 meninas brasileiras ($M = 11,60$, $SD \pm = 1,63$), que responderam à *Body Appreciation Scale*, *Rosenberg Self-Esteem Scale* e *Children's Eating Attitudes Test*. Na análise de regressão linear hierárquica, autoestima, índice de massa corporal e idade representaram 52% da variância da apreciação corporal e a autoestima emergiu como a maior preditora. Observou-se que quanto maior a idade e o índice de massa corporal, menor a apreciação corporal. Meninas com menor apreciação corporal tiveram mais atitudes alimentares transtornadas. Este estudo traz novas descobertas sobre a apreciação corporal em meninas brasileiras, especialmente que a apreciação corporal tende a diminuir durante o período de transição da infância para a adolescência.

Palavras-chave: adolescentes, imagem corporal, autoestima, comportamento alimentar, Brasil

Predictores de Apreciación Corporal en Niñas Brasileñas de 9 a 14 Años

Resumen: La presión social para alcanzar un determinado estándar corporal es perjudicial para el bienestar y puede provocar angustia psicológica en las adolescentes. Este estudio investigó la autoestima, el comportamiento alimentario, la edad y el índice de masa corporal como predictores de apreciación corporal en 222 niñas brasileñas ($M = 11,60$, $DT = 1,63$), que respondieron a la *Body Appreciation Scale*, *Rosenberg Self-Esteem Scale* y *Children's Eating Attitudes Test*. En el análisis de regresión lineal jerárquica, la autoestima, el índice de masa corporal y la edad representaron 52% de la varianza en la apreciación corporal y la autoestima resultó ser el mayor predictor. Se observó que cuanto mayor era la edad y el índice de masa corporal, menor la apreciación corporal. Chicas que tenían menos apreciación corporal tenían actitudes alimentarias disfuncionales. Este estudio aporta nuevos hallazgos sobre la apreciación del cuerpo en las niñas brasileñas, especialmente que la apreciación del cuerpo tiende a disminuir durante el período de transición de la infancia a la adolescencia.

Palabras clave: adolescentes, imagen corporal, autoestima, conducta alimentaria, Brasil

¹Universidade de São Paulo, Ribeirão Preto-SP, Brazil

²Universidade de Ribeirão Preto, Ribeirão Preto-SP, Brazil

³Universidade do Porto, Porto, Portugal

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Correspondence address: Tatiane Possani. Universidade de São Paulo. Av. Bandeirantes, 3900 - Ribeirão Preto-SP, Brazil. CEP 14.040-901. Email: t.possani@alumni.usp.br.

Body image perception begins in early childhood. Age eight years evinces the comparison of appearance with that of other children. Self-assessment becomes more complex at this age (Smolak, 2011). From an early age, girls' mothers and older sisters, the media, and toys expose them to various body models, including extremely thin dolls and muscular and robust dolls (Smolak, 2011). Girls aged from three to 10 years have preferred playing with dolls with a thinner appearance, considering them happier, smarter,

and more generous than dolls with a curvy body and shorter stature (Harriger et al., 2019).

In addition to the choice of toys, the preference for a thin body is high, especially in the female public, as in studies with adolescents and adults. Girls who consider themselves overweight show greater dissatisfaction with their bodies and thus, a greater likelihood toward unhealthy weight control behaviors (Kanellakis et al., 2023; Leal et al., 2020).

The internalization of the ideals of appearance society imposes and the perfectionism in children aged six years have been pointed out as predictors of body dissatisfaction at age seven years, whereas higher self-esteem at age six years has been suggested as a protective factor against the internalization of ideals of appearance at age seven years (Nichols et al., 2018).

As body image, self-esteem can change throughout life, especially in adolescence. If it is based on aspects related to weight and body appearance, it causes greater instability and association with risk factors, such as depressive disorder (De Coen et al., 2024; Fiorilli et al., 2019). Self-esteem comprises individuals' set of feelings and thoughts about their own worth, competence, and adequacy, generating a positive or negative self-image (Rosenberg, 1989).

During puberty, female physical maturation occurs in a challenging way, associated with hormones that involve the onset of menstruation and changes in body size and shape, including fat accumulation in the breasts and hips (Kanellakis et al., 2023). These rapid changes in physical appearance during puberty can pressure girls to prematurely adapt to social standards and expectations, and the earlier these changes occur, the greater their body dissatisfaction and consequent anxiety (Kanellakis et al., 2023).

Girls may adopt unhealthy and dysfunctional eating behaviors to achieve a certain body ideal. If persistent, they result in eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating (American Psychiatric Association [APA], 2023). Eating disorders comprise psychiatric pathologies stemming from multiple biological, psychological, and social factors, showing a higher prevalence in women and young people (APA, 2023).

On the other hand, disordered eating attitudes go beyond those diagnosed with eating disorders. Many individuals experience distorted eating habits, beliefs, and feelings about food due to their dissatisfaction with their body image, as in a sample of Brazilian adolescents (Leal et al., 2020). The concerning prevalence of disordered eating behaviors in adolescents can begin with weight loss attempts, which occurs in both obese and non-obese adolescents before developing eating disorders (Leal et al., 2020). Moreover, adolescent girls often focus on specific characteristics, such as dissatisfaction with their weight and body shape and a desire for a slimmer body (Leal et al., 2020).

For a long time, only the symptoms of negative body image, which are related to body dissatisfaction, were treated and studied. In a broader perspective, the concept of positive body image has emerged in research and interventions (Tylka & Wood-Barcalow, 2015). Positive body image

involves respect for the body, appreciation of body beauty based on its functionality rather than on a norm, and acceptance and protection of the body, removing the focus from negative aspects (Avalos et al., 2005).

Body appreciation is the most studied construct of positive body image, being evaluated by the Body Appreciation Scale (BAS), which includes multiple aspects of body appreciation, such as favorable opinions and acceptance of the body regardless of appearance, respect and protection of the body, attention to needs, healthy behaviors, and the rejection of idealized body images as publicized by the media (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015).

A study with young women showed that body appreciation configured a predictor of decreased depressive symptoms and increased self-esteem (Linardon et al., 2023). Specifically in girls, body appreciation is inversely related to the pressure toward body standards according to the media (Halliwell et al., 2017). Adolescents have shown a wide range of benefits due to body appreciation, such as reduced restrictive eating behaviors and healthier food choices (Halliwell et al., 2017; Lemoine et al., 2018).

A review of the literature shows the scarcity of investigations on body appreciation in adolescents and especially in children. Most studies aim to validate BAS in children (BAS-2C). Their main results show that lower body appreciation is associated with a lower body appreciation, greater occurrence of dieting, and lower rates of positive body-related affects (Halliwell et al., 2017; Lemoine et al., 2018). However, the relationship between age and body appreciation in children and adolescents remains unclear and little explored. Moreover, studies have described that the stigma adolescents reported associated with overweight harm their mental well-being, leading to psychological distress and low self-esteem (De Coen et al., 2024; Fiorilli et al., 2019). However, another gap in the literature refers to the lack of studies on the relationship between BMI and body appreciation in children and adolescents. Studies with adults find different results regarding this relationship, indicating a negative association between the variables (weak in men and slightly higher in women) (He et al., 2020).

This study aimed to investigate self-esteem, eating behavior, age, and body mass index as predictors of body appreciation in 222 Brazilian girls ($M = 11.60$, $SD \pm 1.63$), who answered the Body Appreciation Scale, the Rosenberg Self-Esteem Scale, and the Children's Eating Attitudes Test.

The initial hypothesis of this study postulates that self-esteem, eating behavior, age, and body mass index would emerge as predictors of body appreciation. Its second hypothesis estimates that body appreciation would show a positive correlation with self-esteem and a negative correlation with disordered eating behaviors, as in previous studies (Halliwell et al., 2017; Lemoine et al., 2018).

Finally, this study expected that body appreciation would vary with age as body changes are usually more evident during pubertal development, generating greater comparisons and thus greater body dissatisfaction (Gattario & Frisé, 2019).

Method

Participants

Due to gender differences in body appreciation (Lemoine et al., 2018), only girls were selected for this study. The inclusion criteria were defined as being a girl aged from nine to 14 years who was regularly enrolled in an elementary school. In total, two criteria were used to choose the age group: (1) body changes are more evident due to puberty, resulting in a greater focus on body image; (2) the instruments to assess body appreciation, self-esteem, and eating behavior have been validated for the Brazilian population in this age group. The exclusion criteria were defined as follows: absence of an informed consent form signed by their parents or guardians, failing to sign this form, missing the days of the data collection, and living with a physical or intellectual disability since the assessment instruments are yet to be adapted and validated for these specificities.

Sample size was calculated on GPower. For a 0.05 effect size and 80% statistical power, the estimated sample would total 167 participants. To obtain this sample, 400 invitations were sent, of which 251 were authorized by parents or guardians. Of these, 15 girls either missed the day of data collection or were unwilling to participate and 14 were excluded as more than 20% of their data were missing. The final sample consisted of 222 girls aged from nine to 14 years ($M = 11.60$, $SD = 1.63$). Overall, 42% of the girls were white ($n = 94$) and 41.9% ($n = 93$) were Black and Brown. Participants' BMI ranged from 12.34 to 34.20, with a mean of 19.58 kg/m² ($SD = 3.96$). Moreover, 115 participants (69.85%) showed normal weight and 55, (24.8%) overweight. In total, 61% of the girls studied at a philanthropic school ($n = 136$); 21% ($n = 48$), in private schools; and 17% ($n = 38$), studied in municipal public schools. Moreover, 48% fell into the B2 and C1 economic classes ($n = 107$) and 30% ($n = 67$), in the A and B1 ones.

Instruments

Sample characterization questionnaire. Personal information was investigated by a questionnaire with questions on age, skin color, education.

The Brazilian Criteria of Economic Classification (Associação Brasileira de Empresas de Pesquisa [ABEP], 2019) is based on the ownership of goods by Brazilians. Each owned asset is attributed a score and each class is defined by the sum of this score. The classes are defined by the Brazilian Criteria of Economic Classification based on family income into A (R\$ 25,554.33), B1 (R\$ 11,279.14), B2 (R\$ 5,641.64), C1 (R\$ 3,085.48), C2 (R\$ 1,748.59), and D and E (R\$ 719.81)

Anthropometry and nutritional status. Body weight and height were measured by the research team using girls' BMI-for-age percentiles (de Onis et al., 2007).

The Body Appreciation Scale (BAS). BAS was used instead of the more recent BAS-2 as the latter was validated with Brazilian adults, whereas the first was validated with children aged from 10 to 13 years. Moreover, at the time of this study, BAS-2 was yet to be translated into Brazilian Portuguese [Avalos et al. (2005); Translation into Brazilian Portuguese ($\alpha = 0.80$): Moreira et al. (2018)]. The 13 items of the instrument are evaluated on a five-point scale (1 = never, 5 = always) that assesses the acceptance, respect, and attention given to body needs and opinions favorable to one's own body. The total score (1–65 points) is obtained by averaging the responses, and higher scores indicate greater body appreciation. For this sample, the omega for the total score of 13 items of the BAS equaled 0.88 (95%CI = 0.86–0.90).

The Rosenberg Self-Esteem Scale [Rosenberg (1989); Translation into Brazilian Portuguese ($\alpha = 0.90$). The instrument has 10 items that evaluate positive or negative feelings reflecting general self-esteem. This four-point scale ranges from “strongly agree” to “strongly disagree.” The total score (0–30 points) is obtained by summing the item values, and higher scores indicate higher self-esteem. For this sample, the omega for the total score of the 10-item Rosenberg Self-Esteem Scale equaled 0.83 (95%CI = 0.80–0.86).

Children's Eating Attitudes Test (ChEAT) [Maloney et al. (1988); Translation into Brazilian Portuguese ($\alpha = 0.80$): Moreira et al. (2018)]. The 26 items of the instrument are grouped into two factors: “feeding practice and oral control” and “bulimic behaviors, food concern, and oral control due to social pressure.” This six-point scale ranges from “never” to “always.” Its total score (Factor 1: 0–51 points and Factor 2: 0–27 points) is obtained by summing all items, and higher scores indicate greater disturbed eating attitudes. For this sample, the omega equaled ChEAT-F1 0.82 (95%CI = 0.79–0.86) and ChEAT-F2 0.61 (95%CI = 0.53–0.69).

Procedures

Data collection. This study was carried out in three elementary schools in the state of São Paulo, Brazil. Parents were invited from April to November 2019. Those who agreed to participate signed informed consent forms and answered the sociodemographic questionnaire. Data were collected with the girls on days and times agreed between the school and the researcher. The instruments were applied in small groups and weight and height were measured individually. The collection of anthropometric data followed the guidelines of the Food and Nutrition Surveillance System Technical Standard.

Data analysis. Data were analyzed on SPSS, version 26.0. Missing data were treated by *listwise* exclusion in the analyses. All variables were descriptively analyzed, and normality was by the Kolmogorov-Smirnov test with Lilliefors significance correction and the following criteria: absolute asymmetry and kurtosis values below 3.0 and 8.0, respectively (Kline, 2023). Pearson's correlation coefficients were used to investigate relationships between body

appreciation, self-esteem, eating attitudes, BMI, and age. The predictors of body appreciation were investigated by hierarchical linear regression analyses, which were chosen since this statistical method explores the relationships between variables and tests hypotheses regarding a dependent variable and independent variables (thus corresponding to the objective of this study) to evaluate the influence of the chosen independent variables on the dependent variable “body appreciation.” Another advantage of hierarchical regression refers to its insertion of independent variables in stages rather than simultaneously, which enables more detailed information on the influence of each independent variable on body appreciation. The tolerance and inflation factor of variance in the regression models indicated no multicollinearity. The variables with a statistically significant correlation with body appreciation were added into the model. Continuous variables were centered on the mean and self-esteem was inserted in a first block; ChEAT-Factor 2, in a second block; BMI, in a third block; and age in a fourth block.

Ethical Considerations

This study was approved by the Research Ethics Committee at Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – Universidade de São Paulo – CAAE No. 89878518.6.0000.5407, Opinion No. 2.847.176. The days and times for the research were agreed between the school coordinators and the researcher in charge to minimize any damage to participants’ school activities. The survey was carried out only with the participants who brought informed consent forms duly signed by their guardians. In rooms reserved for this research within

the school and in groups of 10 participants at most, the researcher read the informed consent form with easy-to-understand explanations about the objectives of this research, preservation of anonymity, the confidentiality of all collected information, and the disclosure of data only for scientific purposes to participants. The researcher then explained that the volunteers could refuse to participate in this study even if their parents or guardians had authorized it and that they could withdraw from this research at any time if they wished thus. The girls who expressed their agreement to participate in this study wrote their names in the informed consent form. All girls participated voluntarily and received no remuneration.

Results

Correlation between variables

This study performed Person’s correlation to test the correlations between the studied variables and identify which ones would show significant correlations with body appreciation. Body appreciation (BAS) showed a strong positive significant correlation with self-esteem; a moderate one with age; and significant, negative, and weak one with BMI. It also showed a negative correlation with bulimic behaviors, food concern, and oral control by social pressure (ChEAT-F2), obtaining no significant correlation with ChEAT factor 1. These results confirmed the hypothesis that body appreciation would show a positive correlation with self-esteem and a negative correlation with disordered eating behaviors (Table 1).

Table 1

Pearson’s correlations between continuous study variables

Parameter	Mean <i>SD</i> ±	1.	2.	3.	4.	5.
1. Age (years)	11.60 (1.63)	1				
2. BMI (kg/m ²)	19.58 (3.96)	0.25**	1			
3. BAS	46.37 (10.03)	-0.40**	-0.24**	1		
4. Self-esteem	17.41 (6.01)	-0.38**	-0.14*	0.70**	1	
5. ChEAT-F1	2.91 (3.39)	0.05	0.03	-0.14	-0.21**	1
6. ChEAT-F2	5.30 (4.78)	0.06	-0.10	-0.21**	-0.25**	0.81**

Note. BMI = Body Mass Index; BAS = Body Appreciation Scale; ChEAT-F1 = diet and oral control practices; ChEAT-F2 = bulimic behaviors, preoccupation with food, and oral control due to social pressure; *n* = 180; * *p* < 0.05. ** *p* < 0.01.

Predictors of body appreciation

The investigation of the main objective of this study included the variables with significant correlations with body appreciation into its hierarchical linear regression analyses. The hypothesis regarding the main objective estimated that self-esteem, eating behavior, age, and body mass index would emerge as predictors of body appreciation. Results indicated that self-esteem, BMI,

and age emerged as predictors of body appreciation. In the first regression analysis block, self-esteem ($\beta = 0.70$, $t = 13.32$, $p < 0.001$) was responsible for 49% of the variance of body appreciation, despite the notoriously low influence of BMI and age on body appreciation. Steps 3 and 4 evinced that BMI ($\beta = -0.15$, $t = -2.95$, $p < 0.01$) was responsible for 2% of the variance and age ($\beta = -0.12$, $t = -2.21$, $p < 0.05$), for 1% of the variance of body appreciation (Table 2).

Table 2
Hierarchical regression model predicting body appreciation

		ΔR^2	ΔF	β	t
Body Appreciation ^a F(4.179)=50.77;					
Step 1	0.50	0.49	177.48***		
Self-esteem				0.70	13.32***
Step 2	0.50	0.49	0.45		
Self-esteem				0.69	12.68***
ChEAT-Factor 2				-0.03	-0.67
Step 3	0.52	0.51	8.73**		
Self-esteem				0.66	12.21***
ChEAT-Factor 2				-0.06	-1.11
IMC				-0.15	-2.95**
Step 4	0.53	0.52	4.90*		
Self-esteem				0.62	12.77***
ChEAT-Factor 2				-0.06	-1.14
IMC				-0.13	-2.43**
Age				-0.12	2.21

Note. ^aSample ($n = 180$); * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

This study sought to broaden the current understanding of the predictors of body appreciation in Brazilian girls. It specifically examined the influence of self-esteem, age, BMI, and eating attitudes as predictors of body appreciation. Results indicated that all the studied variables (except for eating attitudes) configured predictors of body appreciation. Self-esteem, BMI, and age predicted body appreciation, explaining 53% of their variance. This study brings new findings about body appreciation in Brazilian girls, particularly that body appreciation tends to decrease during the transition from childhood to adolescence.

As expected, self-esteem configured the strongest predictor for body appreciation. Previous studies have shown the positive relationship between self-esteem and body appreciation, positively associating self-esteem with well-being and intuitive eating in a sample of European adolescents and young adults, highlighting the benefits of greater body appreciation (Lemoine et al., 2018).

On the other hand, in children aged from six to seven years, self-esteem was negatively associated with body dissatisfaction, internalization of appearance ideals, and rewards for muscularity (Nichols et al., 2018). The same relationship between body dissatisfaction and self-esteem has been found in children who would like a larger body and in pre-adolescents who would like to be thinner. This may stem from the influence of low self-esteem on body perception or that of body dissatisfaction on low self-esteem (Nichols et al., 2018, Lemoine et al., 2018).

These findings may result from the influence of low self-esteem on body perception or body dissatisfaction on low self-esteem (Nichols et al., 2018, Lemoine et al., 2018).

These findings confirm the hypothesis of this study that age would constitute a predictor of body appreciation. Moreover, age was negatively correlated with body appreciation and self-esteem, suggesting the decreasing trend in body appreciation and self-esteem from childhood to adolescence.

Bodily changes, such as weight gain during puberty, are often undesirable. Moreover, at this stage, comparison with other people increases body awareness and dissatisfaction with body parts deemed unpleasant. Another factor to be considered is the significant influence of the media on the perception of body image in children and adolescents. The greater the exposure of children and adolescents to content related to a specific standard of beauty, the greater the comparison of their body with this ideal of beauty and the greater the perception of distance from this ideal of beauty, the greater the body dissatisfaction, and thus the greater the emotional suffering (Smolak, 2011).

Adolescents face numerous challenges related to social interaction that can contribute to their self-perception of their bodies and their emotional skills and resources. Thus, it is important that early-age interventions aimed at body image occur broadly, not only regarding appearance, but offering tools toward empowerment and the general feeling of social and group belonging (Gattario & Frisén, 2019).

As expected, BMI emerged as a predictor of appreciation, but explained only 2% of its variance. Moreover, BMI, body appreciation, and self-esteem showed a negative and low-magnitude correlation coefficients. Compared to older ages, weight and body shape have a stronger influence on body appreciation and self-esteem in adolescence (Fiorilli et al., 2019). Excessive focus on weight and BMI can increase body shape concerns, leading to unhealthy dietary control practices and compensatory measures.

Higher BMI and lower body appreciation may be related to puberty body changes (Kanellakis et al., 2023). In this life phase, body perception plays an important role in forming identity, self-concept, and a general feeling of belonging (Gattario & Frisén, 2019).

Parents often use weight and BMI measurements to care for their children's health, which can greatly emphasize appearance and favor body dissatisfaction and emotional distress in children and adolescents (Lawrence et al., 2023). Preadolescents and adolescents aged from 10 to 14 years reported preferring that their parents either not talked or spoke less often about their weight and, when they did, that they would do so in an affectionate and respectful way (Lawrence et al., 2023).

Bulimic behaviors, worries about food, and oral control due to social pressure showed no prediction of body appreciation. Although eating attitudes have shown a globally significant association with body appreciation and self-esteem, the correlation coefficients obtained a low magnitude. The moderate negative correlation between body appreciation and eating disorder symptoms has been documented in adolescents of all sexes but has been used in another eating disorder questionnaire (Baceviciene & Jankauskiene, 2020). The low associations between eating attitudes, body appreciation, and self-esteem may be associated with a sample mostly consisting of pre-adolescents, in which body image issues are still undergoing definition and parents still play a very decisive role in meal management. Another hypothesis suggests that the relation between disordered eating attitudes and body image may be stronger regarding a negative body image, reinforcing the idea that positive body image constitutes a construct unlike that of negative body image, acts as a protective factor, and decreases disordered eating attitudes (Avalos et al., 2005). Positive body image is associated with higher body satisfaction, higher levels of optimism, and self-esteem (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015).

In recent years, Brazil has faced an increase in the number of studies assessing negative body image, but the evaluation of the positive aspects of the construct remains scarce, which is unfortunate as understanding body appreciation in this age group could increase effective interventions to prevent eating disorders since a positive body image can constitute a protective factor for body image dissatisfaction and distortion (Gattario & Frisén, 2019).

Despite its strengths, this study has some important limitations, such as its cross-sectional design, which prohibits inferences on causality. A larger sample with participants the age of whom would encompass the whole spectrum of adolescence would have enabled the evaluation of possible changes to the predictive role of the studied variables throughout adolescence. This study ignored other possibly relevant predictors, such as self-objectification and media influence, and other possibly moderating variables in the relationship between body appreciation and study variables, such as the onset of menarche. Finally, this study would be equally relevant for boys.

Therefore, longitudinal studies that follow girls from early childhood, puberty, and early adulthood are necessary to better understand the results of our study, especially the variables that influence the decrease in body appreciation and self-esteem throughout development, as per Halliwell et al. (2017).

This study brings new findings about body appreciation in Brazilian girls during their development; mainly that self-esteem, BMI, and age constitute predictors of body appreciation, of which self-esteem is the strongest predictor. The trend of body appreciation decreasing with increasing age and BMI necessitates age-specific (childhood and adolescence) interventions to increase body appreciation. Particular attention should be given to interventions that focus on increasing self-esteem and body appreciation, which can effectively improve body shape/weight concerns in girls.

Finally, girls who showed more bulimic behaviors, worries about food, and oral control due to social pressure tended to show less body appreciation, highlighting the importance of favoring body appreciation as a form of preventing and treating eating disorders.

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- Tatiane Possani* is a Ph.D. student at Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto of the Universidade de São Paulo, Ribeirão Preto-SP, Brazil.
- Maria Fernanda Laus* is a Professor at Universidade de Ribeirão Preto, Ribeirão Preto-SP, Brazil, and a Professor in the Graduate Program in Psychobiology at Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto of the Universidade de São Paulo, Ribeirão Preto-SP, Brazil.
- Wigna Gabriella da Silva Alves* is an undergraduate student at Universidade de São Paulo, Ribeirão Preto-SP, Brazil.
- Sandra Torres* is a Professor at Faculdade de Psicologia e de Ciências da Educação and Centro de Psicologia of the Universidade do Porto, Porto, Portugal.
- Sebastião Sousa Almeida* is a Professor at Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto of the Universidade de São Paulo, Ribeirão Preto-SP, Brazil
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