



Science, Movement and Health, Vol. XIV, ISSUE 1, 2014
January 2014, 14 (1): 138-142

Original article

THE RELATION BETWEEN WEIGHT, PERCEIVED PHYSICAL COMPETENCE AND BODY IMAGE IN EARLY ADOLESCENCE

NANU EUGENIA CRISTINA¹, BĂBAN ADRIANA¹

Abstract

Purpose. The aim of the present study is to explore the relation between perceived physical competence, body mass index and physical appearance esteem in early adolescence.

Methods. A cross-sectional design, comprising 253 early adolescents from 11 to 13 years old (mean age = 12.32, SD = .57) was implemented. Hierarchical multiple regressions were used in order to identify direct and interaction effects.

Results. Significant gender differences were found in both physical appearance esteem and contributive factors. The beneficial effect of perceived physical competence on physical appearance esteem is higher for girls compared to boys.

Key Words: appearance esteem, early adolescence, perceived physical competence.

Introduction

Researches document that the way adolescents perceive their physical self and feelings experienced while thinking about own appearance have a significant influence on how they evaluate themselves generally (Smolak, 2004; Ricciardelli & McCabe, 2001). The mental image of own body, appraisals of appearance and associated emotions are concentrated under the construct of body image (Cash & Pruzinsky, 2002). Studies document a significant relation between body image dissatisfaction and eating disorders (Rumsey & Harcourt, 2005). Negative thoughts and feelings about one's body seem to develop from a very early age and reach their peak in adolescence (McCabe & Ricciardelli, 2001; Smolak, 2004).

One of the biological factors that contribute to satisfaction with physical appearance is the body weight. More specific, studies show that being overweight is a significant predictor of dissatisfaction with overall appearance (Presnell, Bearman & Stice, 2004; Wilson, Tripp & Boland, 2005; Markey, 2010). Also, the underweight status can be a cause of dissatisfaction. Nevertheless, being underweight seems to be a distressful condition only for boys (Presnell et al., 2004). The perception and the subjective evaluation of own weight is influenced by gender, age and sociocultural context. Girls tend to overestimate their weight and express a lower weight satisfaction compared to boys. Studies show that almost a half of the underweight adolescents consider they have a normal weight, while almost half of the normal weight girls would like to decrease their weight (Brener, Eaton, Lowry & McManus, 2004; Tremblay & Limbos, 2009). The most incriminating factor is the sociocultural context that promotes unrealistic images of beauty through mass-media. Experimental studies pointed that a short exposure to images of thin ideal for

girls and muscular ideal for boys is sufficient to generate negative attitude toward own body. The effect is stronger in adolescence compared to other developmental periods (Groesz, Levine & Murnen, 2001; Grabe, Ward & Hyde, 2008).

While extensive research was conducted to identify risk factors in body image dissatisfaction, only a few studies focused on positive body image and related factors (Cash et al., 2002). Studies regarding gender differences suggest that boys' superiority in levels of satisfaction is related to the social construction of body image across gender. Boys learn to appreciate muscularity and the functional competence of the body (Ricciardelli, McCabe, Holt & Finemore, 2003). On the other side, girls are focused on the aesthetic of the body and invest a lot of resources for managing appearance (Cash et al., 2002).

Exploring functional and aesthetic body image in adolescence, Abbot and Barber (2011) concluded that involvement in any type of sport was associated with a higher focus on functional body image. Physical activity is recognized to have positive effects on self-esteem (Fox, 2000) and also on body image (Smolak, 2004). Richman and Shaffer (2000) tested a sample of college females on the association between participating in sports on one side and self-esteem and potential mediators such as psychosocial variables, on the other side. They concluded that physical activities favor the development of physical competence, positive body image and gender flexibility, leading to a more positive self-esteem. Children who practice sports experience more situations of exposing their body in front of sport colleagues. Therefore, they might not manifest concerns while revealing their body, especially in a secure environment.

The aim of the present study is to explore the relation between perceived physical competence, social

¹ Faculty of Psychology and Educational Sciences, Babes-Bolyai University, Cluj-Napoca, Romania
CORRESPONDENCE AND REPRINT REQUESTS: NANU EUGENIA CRISTINA Email: crisnanu@gmail.com

acceptance and body image in adolescence. We will focus on appearance esteem, defined as a global evaluation of appearance (Mendelson, White & Mendelson, 1996) because appearance esteem is considered having a relevant contribution to adolescents' global self-concept. In line with previous researches, our hypotheses were that boys will experience higher appearance esteem compared to girls, the relation between body mass index (BMI) and appearance esteem is curvilinear for boys and linear for girls and athletic competences significantly contribute to appearance esteem for both boys and girls.

Participants

The study sample consisted of 253 students (118 boys and 135 girls) ranging from 11 to 13 years old, students from three schools situated in the city area. Based on BMI growth charts cut-off scores (CDC 2000, WHO 2010), 166 participants (64.8%) were classified as having normal weight, 18 (7%) were underweight and 71 (27.7.1%) were overweight. The mean of body mass index was 19.36 (SD=3.51) for girls and 19.71 (SD=3.78) for boys.

Measures

Body Mass Index (BMI)

Body mass index was calculated from the equation (weight in kg)/(height in m²), using measures taken in collaboration with schools medical assistants. Cut-off scores for children and adolescents (Cole, 2000) were used to identify participants' weight category. In our sample, consisting of 135 girls (mean BMI 19.36, SD 3.51) and 120 boys (BMI, mean = 19.71, SD 3.78), 7% were underweight, 65% had a normal weight, 19% were overweight and 8% were obese.

Body-esteem – Appearance

Attitude toward overall physical appearance was measured with Body Esteem – Appearance subscale of “The Body Esteem Scale for Children” (Mendelson & White, 1996). The subscale consists of 13 statements that address the satisfaction with physical appearance (“I like what I see when I look in the mirror”, “There are a lot of things I'd change about my look, if I

could”). Respondents options were 1 (no), 2 (sometimes) or 3 (yes). The authors reported an internal consistency coefficient of $\alpha = .87$. In the present study, observed scores ranged from 18 to 39 and the scale had good internal reliability (Cronbach's $\alpha = .84$).

Physical competence

The perceived physical competence was measured using the *Athletic Competency subscale of Self Perception Profile for Children* (Harter, 1982 apud. Muris, Meesters, Fijen, 2003). The subscale consists in six items. For each item, children have to choose from two opposite statements (“Some children consider they are not good enough in sports” and “Some children consider they are very good in sports”) and to decide whether the chosen statement is “sometimes like me” or “exactly like me”. Items are scored on a scale from 1 to 4. The author reported an internal consistency of .78 for this subscale. In the present sample, the Cronbach's α is .79 for athletic competence.

All the scales were translated into Romanian language and back in English using the reverse translation in order to ensure the accuracy of original wording. The research team checked that all items were translated in a correct and meaningful way.

Descriptive statistics

Gender differences in body image and perceived athletic competencies

Independent t tests were run for each studied variable in order to identify specific gender differences. Boys scored significantly higher than girls in appearance esteem ($t = - 3.797$, $df = 249$, $p = .000$) and athletic competencies ($t = - 5.171$, $df = 249$, $p = .000$). Therefore, the following analyses were conducted separately for each gender.

Correlations among BMI, appearance esteem and perceived athletic competencies as well as means and standard deviations are presented in Table 1. The results displayed above the diagonal represent the girls' sample while below the diagonal is described the boys' sample.

Table 1. Means, standard deviations and correlations among BMI, appearance and athletic competencies.

	1	2	3	4
Girls				
Boys				
BMI (1)	-	-.321**	-.129	19,38 (3.51)
Appearance esteem (2)	-.194*	-	.227**	27.66 (4.67)
Athletic competencies (3)	-.079	.169	-	16.79 (4.12)
Mean (SD) (4)	19.49(3.42)	29.67(3.73)	19.38 (3.74)	-

Note. ** $p < .01$, * $p < .05$. Boys scores – below the diagonal. Girls scores – above the diagonal

The relation between BMI and appearance esteem was moderate for girls and small for boys. Specifically, higher levels of BMI were related to lower appearance

esteem. Regarding athletic competencies, they correlate with appearance esteem for girls but not for boys.

Predictors of attitude toward appearance across

Hierarchical multiple regression analyses were run to test for BMI, athletic competencies and their interaction as predictors of appearance esteem separately for boys and girls. For boys, given previous evidence on the quadratic relation between BMI and body esteem (Cash et al., 2002; Presnell et al., 2004), we first tested the quadratic effect. The changes in R² were significant when adding the quadratic term ($\Delta R^2 = .03$, $F(1,115) = 4.56$, $p = .035$). In our sample, the relation between BMI and appearance esteem is a curvilinear relation, such as both low and high BMIs are associated with low appearance esteem. Therefore, for boys, in the following analysis, we used quadratic term for BMI.

For testing interaction effects, in order to avoid multicollinearity, the scores were centred according to

gender

Aiken and West (1991) recommendations. The two-way by-products were calculated by multiplying the centred variables. BMI was entered first, followed by athletic competencies and the product term.

The results from the hierarchical multiple regression analyses are presented in Table 2. For girls, the regression model predicted a significant amount of variance in appearance esteem [$F(3,133) = 8.15$, $p = .000$]. Also the changes in R² were significant when adding perceived athletic competence as a predictor. Therefore, while controlling for BMI, perceived athletic competencies significantly contributed to appearance esteem. No evidence of interaction between BMI and athletic competencies was found.

Table 2. Summary of multiple regression for variables predicting physical appearance esteem

	ΔR^2	β	t
Appearance esteem			
Girls			
<i>Step 1</i>	.15**		
BMI	.12**		
		-.35	-4.351**
<i>Step 2</i>	.02*		
BMI		-.32	-3.912**
Athletic competencies		.16	2.026*
<i>Step 3</i>	.00		
BMI		-.31	-3.762**
Athletic competencies		.17	2.092*
BMI x Athletic competencies		.08	.987
Boys			
<i>Step 1</i>	.12*		
BMI	.07*		
		-.27	-3.04*
<i>Step 2</i>	.02		
BMI		-.26	-2.961*
Athletic competencies		.15	1.712
<i>Step 3</i>	.03*		
BMI		-.28	-3.217*
Athletic competencies		.12	1.404
BMI x Athletic competencies		-.17	-1.94*

Note: * $p < .05$, ** $p < .01$ BMI – Body mass index (Kg/m²)

Compared to girls, the regression model for boys predicted a lower amount of variance in appearance esteem [$F(3,112) = 5.471$, $p = .002$]. The changes in R² were not significant in the second step. Therefore, athletic competencies did not contribute to an increase in appearance esteem when BMI was controlled. In other words, boys who differed in athletic competencies were not feeling better with their

appearance when BMI was controlled. When adding the product term, we obtained a significant R² change, proving the presence of an interaction effect between BMI and perceived athletic competencies. As illustrated in Figure 1, the simple slope was significant for boys with high levels of athletic competencies ($t = -3.37$, $p = .001$) and middle levels of athletic competencies ($t = -3.39$, $p = .000$).

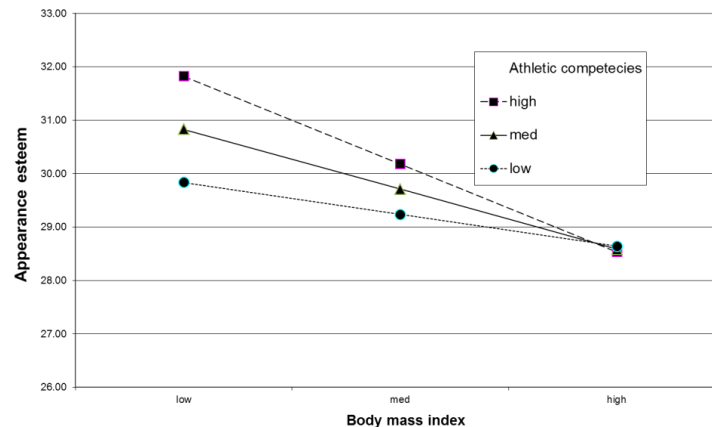


Fig. 1 Interaction effects between BMI and athletic competencies on physical appearance esteem among boys

Discussion

The aim of the article was to examine the relation between body mass index, perceived athletic competencies and physical appearance esteem, in early adolescence. We were interested in gender differences in appearance esteem and the potential predictive value of BMI and perceived athletic competencies, as well as their interaction.

The results are in line with previous findings (Hargreaves & Tiggemann, 2002) confirming that gender differences in physical appearance esteem are already present in early adolescence. If exploring attitude toward physical appearance for each weight category, boys' superiority seems to be related to the fact that their scores are high even if overweight. Boys' lower scores were found in the underweight group. For the girls, both underweight and normal weight registered similar scores in attitude toward appearance, while the scores drop significantly in the overweight group. So, girls have the same positive attitude toward body image if they are underweight or have a normal weight. Being thin is considered normal even at this age. For boys, the attitude toward body image is much more similar across weight categories and both underweight and overweight seem to be rather problematic. The small number of underweight subjects impedes us to draw firm conclusions but the trend of the results is in line with previous studies. For example, Calzo, Sonnevile, Haines, Blood, Field and Austin (2011), in an extensive longitudinal study, identified gender as being an important contributive factor in the relation between weight status and body image. For girls, BMI situated above the 50th percentile led to higher body image dissatisfaction, while for boys, BMI situated under the 10th percentile and over the 75th had similar effects. In our sample, we found evidence of a linear relation between BMI and appearance esteem for girls and a curvilinear relation for boys, such as small BMI as well as a high BMI are associated with low physical appearance esteem.

Athletic competence proved to be positive contributors to appearance esteem but its pattern of influence differed across gender. For girls, perceived

athletic competence explained a significant additional amount of variance, while we controlled for BMI. Therefore, early adolescent girls who consider having high physical competence also express higher appearance esteem when the effect of BMI is eliminated. For boys, no such effect was found. Nevertheless, a significant interaction effect was identified between BMI and athletic competence, with athletic competencies as moderator, such as the relation between weight and appearance esteem is more intense when the athletic competence is high and median compared to low.

In this sample, the beneficial effect of perceived athletic competence on appearance esteem is higher for girls compared to boys. Although previous researches pointed that the superiority of boys in appearance esteem is related to a higher focus on functional body (Cash et al., 2002, Lyu & Gill, 2012), high levels of perceived athletic competence contributed to an increase in girls' appearance esteem. The result is supported by Haugen, Säfvenbom and Ommundsen's (2011) finding that the effect of physical activity on global self-worth, through physical self-esteem, was stronger for females.

Limitations. There are some limitations that should be considered when interpreting these findings. First, we used a cross-sectional design. Therefore, no causal relations can be drawn. In other words, we are not able to establish the direction of the relation between perceived athletic competencies and appearance esteem. Being dissatisfied with own body image could be an obstacle in physical activity involvement, especially for girls. Longitudinal studies could clarify the direction of the relation mentioned above. Also, the sub-representation of the underweight group makes it difficult to draw conclusions regarding how weight status makes a difference.

Conclusions

The purpose of the study was to examine the relation between appearance esteem, BMI and athletic competencies.

Three main important findings can be extracted from this sample. First, gender differences concerning

attitude toward appearance are already in place in early adolescence. Second, the relation between BMI and appearance esteem is also different across gender. For boys, both underweight and overweight statuses are related to low appearance esteem. In girls' sample, only high levels of BMI are related to low appearance esteem. Third, perceived athletic competency is a protective factor more valuable for girls than for boys. According to previous researches, focusing on functional body is a protective factor against body image dissatisfaction and eating disorders (Smolak, Murnen & Ruble, 2000; Abbott et al., 2009). Future longitudinal research to examine how practicing different types of sport contribute to changes in body-esteem might be valuable.

References

- Abbott, B. D. & Barber, B. L., 2010, Embodied image: Gender differences in functional and aesthetic body image among Australian adolescents. *Body Image*, 7, pp. 22-31.
- Aiken, L. S., & West, S. G., 1991, *Multiple regression: Testing and interpreting interactions*. Newbury Park, London, Sage.
- Brener, N. D., Eaton, D. K., Lowry, R. & McManus, T., 2004, Weight Perception and BMI among High School Students. *Obesity Research*, 12, 11, pp. 1866-1875.
- Calzo, J.P., Sonnevile, K.R., Haines, J. Blood, E.A., Field, A.E. & Austin, B. 2012, The Development of Associations Among Body Mass Index, Body Dissatisfaction, and Weight and Shape Concern. Adolescent Boys and Girls, in *Journal of Adolescent Health*, 51, pp. 517-523.
- Cash, T.F. & Pruzinski, T., 2002, *Body image*, The Guilford Press.
- Fox, K. R., 2000, Self-esteem, self-perception and exercise. *International Journal of Sport Psychology*, 31, pp. 228-240.
- Grabe, S., Hyde, J., Ward, L. 2008, The Role of the Media in Body Image Concerns Among Women: A Meta-Analysis of Experimental and Correlational Studies. *Psychological Bulletin*, 134, 3, pp. 460-476.
- Groesz, L. M., Levine, M. P., & Murnen, S. K. 2002, The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, 31, pp. 1-16.
- Hargreaves, D. & Tiggemann, M. 2002, The Role of Appearance Schematicity in the Development of Adolescent Body Dissatisfaction. *Cognitive Therapy and Research*, 26, 6, pp. 691-700.
- Haugen, T., Säfvenbom, R. & Ommundsen, Y., 2011, Physical activity and global self-worth: The role of physical self-esteem and gender. *Mental Health and Physical Activity*, 4, pp. 49-56.
- Lyu, M. & Gill, D. 2012, Perceived physical competence and body image as predictors of perceived peer acceptance in adolescents. *Asian Journal of Social Psychology*, 15, pp. 37-48.
- Markey, C.N., 2010, Invited Commentary: Why Body Image is Important to Adolescent Development. *Journal of Youth Adolescence*, 39, pp. 1387-1391.
- Mendelson, K. M. & White, D. R., 1996, Self-Esteem and Body Esteem: Effects of gender, Age and Weight. *Journal of Applied Developmental Psychology*, 17, pp. 321-346.
- Muris, P., Meesters, C. & Fijen, P., 2003, The Self-Perception Profile for Children: further evidence for its factor structure, reliability and validity. *Personality and Individual Differences*, 35, pp. 1791-1802.
- Ricciardelli, L. A., McCabe, M. P., Holt, K. E. & Finemore, J., 2003, Abiopsychosocial model for understanding body image and body change strategies among children. *Applied Developmental Psychology* Vol. 24, pp. 475-495.
- Ricciardelli, L. A. & McCabe, M. P. 2001, Children's Body Image Concerns and Eating Disturbance: A Review of the Literature. *Clinical Psychology Review*, 21, 3, pp. 325-344.
- Rumsey, N., 2008, The Psychology of Appearance: Why health psychologists should "do looks". *The European Health Psychologist*, Vol. 10.
- Presnell, K., Bearman, S. K. & Stice, E., 2004, Risk Factors for Body Dissatisfaction in Adolescent Boys and Girls: A Prospective Study. *International Journal of Eating Disorders*, 36, 4, pp. 389-401.
- Richman, E. L. & Shaffer, D. R., 2000, If you let me play sports: How might sport participation influence the self-esteem of adolescent females? *Psychology of Women Quarterly*, 24, pp. 289-299.
- Smolak, L., 2004, Body image in children and adolescents: where do we go from here? *Body Image*, 1, pp. 15-28.
- Smolak, L., Murnen, S.K. & Ruble, A.E. 2000, Female athletes and eating problems: a meta-analysis. *International Journal of Eating Disorders*, 27(4), pp. 371-380.
- Tremblay, L. & Limbos, M., 2009, Body Image Disturbance and Psychopathology in Children: Research Evidence and Implications for Prevention and Treatment. *Current Psychiatry Reviews*, 5, pp. 62-72.
- Wilson, J. M. B., Tripp, D. & Boland, F. J., 2005, The relative contributions of subjective and objective measures of body shape and size to body image and disordered eating in women. *Body Image*, 2, pp. 233-247.