

A CONTRIBUTION TO THE VALIDATION OF THE PHYSICAL ACTIVITY ENJOYMENT SCALE IN AN ITALIAN SAMPLE

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Assessing motivation for and enjoyment of physical activity is an important step in the promotion of an active lifestyle. This study assessed the factor structure and reliability of the Italian version of the Physical Activity Enjoyment Scale in a sample of Italian students ($N = 5,934$) aged from 11 to 19. Confirmatory factor analysis was performed on subsamples of girls and boys grouped into 4 age categories. Gender and age differences were also examined through a 2 (sex) \times 4 (age) multivariate analysis of variance. Findings supported the factor structure and reliability of the Italian version of the PACES.

Keywords: enjoyment, fun, physical education, motivation, PACES.

Many nations are making efforts in promoting regular physical activity to improve health and behavioral outcomes of young people and adults. Many authors have underscored the importance of regular physical activity throughout an individual's lifespan. An appropriate amount (quantity, quality, and intensity)

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of exercise has been found to lead to relevant physiological and psychological benefits (Biddle, Gorely, & Stensel, 2004; Strong et al., 2005). Different national and crossnational programs, such as “Healthy People 2010” (U.S. Department of Health and Human Services, 2000) in the USA, and the “Health Behaviour in School-aged Children – HBSC” promoted by the WHO Regional Office for Central Europe (Currie et al., 2004), acknowledged that physical activity is a major concern for both National Health Organizations and governments. The HBSC survey presents an overview of key health and well-being measures, and health related behaviors. This report brings to light the early drop-out of youngsters from sports and leisure physical activity, females in particular.

In Italy, a national survey (ISTAT, 2003) showed a dramatic decrease in frequency of sport and physical activity participation across childhood, adolescence, and young adulthood, followed by an increase in sedentary behavior. One of the main causes of the decreasing amount of participation in sport and physical activity is low levels of motivation. Therefore, a number of authors have emphasized the need for early interventions to promote a positive attitude toward physical activity (DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998; Telama, Laakso, Yang, & Viikari, 1997).

Physical education (PE) classes at school are social environments where motivational processes can be easily observed and assessed (Biddle, 2001). Many authors (e.g., Deci & Ryan, 1985; Pelletier et al., 1995; Reeve & Deci, 1996) have argued convincingly that intrinsically motivated people engage in physical activity for the sake of fun and personal improvement. Fun is considered one of the most important reasons for children and adolescents to be involved in physical activity, and a lack of fun is likely to lead them to withdraw (O’Reilly, Tompkins, & Gallant, 2001; Supaporn & Griffin, 1998).

In sport and exercise research there are several definitions of the construct of enjoyment. Scanlan and Simons (1992), for example, defined enjoyment as “a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking and fun” (pp. 202-203). Enjoyable experiences during PE classes are expected to enhance intrinsic motivation, develop positive attitudes, and promote long-lasting adherence to physical activity (Ryan, Frederick, Leps, Rubio, & Sheldon, 1997; Wankel, 1993).

Despite the importance of the enjoyment construct, scant research has been conducted to address the development of specific assessment tools. A notable exception is the Physical Activity Enjoyment Scale (PACES) proposed by Kendzierski and De Carlo (1991). The authors conducted two validation studies providing evidence for the reliability and validity of the scale. The scale was then used successfully by several investigators. De Gracia and Marcò (2000), for example, examined the effects of an exercise program on psychological well-being, perceived effort, and enjoyment in a sample of sedentary elderly.

Furthermore, Motl, Berger, and Leuschen (2000) showed that the PACES scores mediated the acute mood changes of participants engaged in rock-climbing and a health education class. The PACES was later revised and validated by Motl et al. (2001) in a sample of U.S. girls. However, crossvalidation studies are needed to take account of gender, age, and culture differences. Therefore, the main goal of this investigation was to examine the factorial invariance and reliability of the questionnaire across gender and age in a sample of Italian students.

METHOD

PARTICIPANTS

Participants ($N = 5,934$; 3,079 girls and 2,855 boys) were drawn from different schools located in a north-eastern region of Italy, and attended the first (middle school) or second (upper school) level of Italian secondary school. The sample included participants aged from 11 to 19 years (see Table 1). The purpose of the study was explained to school principals and teachers to obtain permission to conduct the investigation. Students' parents, or students themselves (if over eighteen), provided informed consent.

THE PACES

The original version of the PACES (Kendzierski & De Carlo, 1991) included 18 items scored on a 7-point bipolar scale. The scale was intended to gauge the extent to which an individual enjoys doing any physical activity. In a sample of 1797 adolescent girls, Motl et al. (2001) provided evidence for factorial and construct validity of a revised version of the PACES. The revised version consists of 16 statements scored on a 5-point Likert scale ranging from 1 (*disagree a lot*) to 5 (*agree a lot*). The stem for each item is "When I am active ...". Nine items are positive: "I enjoy it", "I find it pleasurable", "It gives me energy", "It's very pleasant", "My body feels good", "I get something out of it", "It's very exciting", "It gives me a strong feeling of success", "It feels good". Seven items are negative: "I feel bored", "I dislike it", "It's no fun at all", "It makes me depressed", "It frustrates me", "It's not at all interesting", "I feel as though I would rather be doing something else". High scores on the positive items and low scores on the negative items would indicate a high enjoyment of physical activity. A total enjoyment score can also be obtained by reversing negative item scores and summing them to positive item scores. With this procedure, total enjoyment scores can range from 16 to 80 (maximum enjoyment). The questionnaire was translated and adapted to the Italian population using the back translation technique. Two Italian researchers fluent in English independently translated the questionnaire from English into Italian, and then discussed extensively their translations until they reached complete agreement on all items. The translated

items were retranslated into English by a professional translator who was a native English speaker. Finally, the two researchers carefully examined the translated and retranslated items and reached consensus on an Italian translation. The Italian version of the PACES is available from the first author upon request.

PROCEDURE

The assessment was conducted at the end of PE lessons in quiet locations without the presence of the teacher. Students were informed that their participation was voluntary and asked to fill out the scale anonymously. They were presented with the scale, told that there were no right or wrong answers, and assured of the confidentiality of their responses. Investigators made sure that participants had a complete understanding of the instructions and items.

DATA ANALYSIS

Data were preliminarily screened to determine the accuracy of data entry and to examine whether the assumption of normality of the distribution was met. Cases with missing data or containing out-of-range values were deleted. Univariate or multivariate outliers were also identified and removed from analysis. From the original sample, 84 cases were removed leading to a final sample of 5,934 cases. The skewness and kurtosis values of the individual items indicated item responses were not seriously deviating from normality. Confirmatory factor analysis was performed for subsamples of girls and boys aged 11-12, 13-14, 15-16, and 17-18-19 years. A 2 (sex) \times 4 (age categories) multivariate analysis of variance (MANOVA) was also conducted on the total scores to examine gender and age differences.

RESULTS

CONFIRMATORY FACTOR ANALYSIS

Descriptive statistics and confirmatory factor analysis results are reported in Table 1. A two-factor solution was specified to include separately the nine positive items and the seven negative items. The maximum likelihood method of estimation was used, which is appropriate when the data are normally distributed. The two-factor solution fit was examined based on the chi-square/degrees of freedom ratio (χ^2/df), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA) (see Hu & Bentler, 1999). Good fit was shown across gender and age (Table 1), in that the χ^2/df ratio was less than 5.0 (Kelloway, 1998), the fit indices (GFI, AGFI, and CFI) were equal to or larger than .90 (Hu & Bentler), and the root mean square error of approximation (RMSEA) was below .10 (Steiger, 1990). Reliability (i.e., internal consistency) of the positive

TABLE 1
DESCRIPTIVE STATISTICS AND CONFIRMATORY FACTOR ANALYSIS FIT INDICES OF THE PHYSICAL ACTIVITY ENJOYMENT SCALE

Sample	n	Positive scale		Negative scale		χ^2 (<i>df</i> = 89)	χ^2/df	GFI	AGFI	CFI	RMSEA		
		M	SD	α	M							SD	α
		Girls 11-12	440	3.69	0.70							.85	1.69
Boys 11-12	439	3.87	0.68	.82	1.59	0.64	.78	278.62	3.13	.92	.90	.90	.07
Girls 13-14	732	3.52	0.69	.86	1.80	0.69	.85	391.38	4.40	.93	.90	.93	.07
Boys 13-14	777	3.70	0.70	.84	1.65	0.64	.81	350.59	3.94	.94	.92	.93	.06
Girls 15-16	884	3.25	0.74	.89	2.02	0.80	.88	436.47	4.90	.92	.90	.93	.08
Boys 15-16	787	3.43	0.72	.85	1.76	0.69	.84	417.45	4.69	.91	.90	.90	.08
Girls 17-19	1023	3.29	0.72	.89	1.91	0.73	.87	411.63	4.63	.91	.90	.92	.08
Boys 17-19	852	3.34	0.72	.88	1.80	0.73	.87	418.91	4.71	.91	.90	.91	.08

Abbreviations: α = Cronbach alpha, χ^2 = Chi-square, χ^2/df = Chi-square/degrees of freedom ratio, GFI = Goodness of fit index, AGFI = Adjusted goodness of fit index, CFI = Comparative fit index, RMSEA = Root mean square error of approximation

and negative scales was also good, with Cronbach alpha values ranging from .78 to .89. For the whole sample, Pearson product-moment correlation between the two scales was -.67.

MANOVA GENDER BY AGE

MANOVA 2 (sex) \times 4 (age categories) on total scores of the positive and negative scales of the questionnaire yielded significant results for sex (Wilks' $\lambda = .99$, $F_{2, 5925} = 37.34$, $p < .001$), age (Wilks' $\lambda = .94$, $F_{6, 11850} = 63.37$, $p < .001$), and sex by age interaction (Wilks' $\lambda = 1.00$, $F_{6, 11850} = 4.24$, $p < .001$). Univariate follow-up revealed significant differences on the total scores of the positive scale (sex: $F_{1, 5926} = 59.29$, $p < .001$, partial $\eta^2 = .01$; age: $F_{3, 5926} = 121.77$, $p < .001$, partial $\eta^2 = .06$; sex by age: $F_{3, 5926} = 3.54$, $p < .02$, partial $\eta^2 < .01$) and the negative scale (sex: $F_{1, 5926} = 64.50$, $p < .001$, partial $\eta^2 = .01$; age: $F_{3, 5926} = 32.94$, $p < .001$, partial $\eta^2 = .02$; sex by age: $F_{3, 5926} = 3.99$, $p < .01$, partial $\eta^2 < .01$). Compared to boys, girls reported lower mean total scores on the positive scale and higher scores on the negative scale (Table 1). This trend was stable across age categories. In addition, mean total scores on the positive scale were found to decrease over the years for both boys and girls, while total scores on the negative scale were shown to increase.

DISCUSSION

Our results support the factor structure and reliability of the Italian version of the PACES. Therefore, the scale seems to be appropriate for the assessment of individuals' enjoyment of physical activity in the PE setting. The availability of a valid measure of enjoyment would enable teachers to evaluate the efficacy of their teaching strategies aimed at enhancing students' participation and motivation. Moreover, the assessment of psychological and emotional dimensions, such as enjoyment, could deepen our knowledge of the causes of youths decreasing physical activity. Understanding enjoyment motives and the relationship between enjoyment and other psychological variables can help researchers and practitioners design more effective intervention strategies.

The findings of our study also revealed gender differences in physical activity enjoyment, with girls reporting lower enjoyment than boys, and a decrease of enjoyment being found with age. These results are consistent with the findings of previous research (Carroll & Loumidis, 2001; Prochaska, Sallis, Slymen, & McKenzie, 2003). Enjoyment has important effects on individuals' quality of life (Kahneman, Diener, & Schwarz, 1999), therefore it should be viewed as a priority when the goal is to encourage healthy lifestyle habits. Enhancing intrinsic motivation through enjoyment could lead to increased exercise adherence and promotion of the health benefits associated with it. This issue is particularly

important for young adolescent girls, because girls are often less active than boys, tend to withdraw from physical activity at a young age, and are likely to become more sedentary during adulthood (Armstrong & Welsman, 2006; Belza & Warms, 2004). Therefore, assessing and promoting enjoyment in PE classes may enhance future exercise adherence.

Future investigations focused on the PE setting could examine the link of enjoyment to other variables, such as choice of curriculum activities, class and school characteristics, teaching styles and strategies, teacher's traits and instructional techniques, and motivational climate. Further research is necessary to better evaluate the reliability and validity of the PACES in different physical activity domains such as sport and leisure. Given that the PACES has been so far mainly used with children and adolescents, further validation is also needed across different samples to take account of a range of variables including age, occupation, gender, and culture (Crocker, Bouffard, & Gessaroli, 1995). Our study made a contribution in this direction, supporting the use of the PACES in the context of Italian PE.

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