

EUROPEAN PSYCHOMOTRICITY JOURNAL

<http://www.psychomotor.gr/epj.htm>

ISSN 1791-3837

European Psychomotricity Journal 2008; 1; 2, 61-72

Published by: Athlotypo Sports Publishing

<http://www.athlotypo.gr/>

On behalf of:

[Scientific Psychomotor Association Hellas](#)

Additional services and information for *the European Psychomotricity Journal* can be found at:

Email Alerts: <http://www.psychomotor.gr/communication.htm>

Subscriptions: <http://www.psychomotor.gr/subscription.htm>

REVIEW ARTICLE

Questionnaires Measuring the Physical Self Children: A Review

Christina Sypsa & Johan Simons

Department Rehabilitation Sciences, FaBeR, KULeuven, Tervuursevest 101, B 3001 Heverlee

Abstract

Maintaining a good physical self esteem is a protective factor in children's development, while negative scores of it indicate different kinds of problems (e.g. depression, eating disorders). In this review several properties of the questionnaires that measure the above notion and its components are discussed. The search of this kind of assessment tools for children's physical self was limited to the last 15 years. From the literature 15 results were found to adhere to the criteria set in the first place, with 11 of them to measure the different aspects of physical self separately (mainly body image) and 4 of them to evaluate the concept more totally. The paper focuses on a short description and categorization of the tests detected and a narrowing to the instruments that approach physical self in a more integrative way.

Keywords: *physical self-concept, physical self-esteem, body image, children, questionnaires, review*

Introduction

The concept of self-esteem and the relevant notions, such as self-concept, self-image, self-perception etc. has been of interest in research, in clinical settings and maybe in the general public as well (Butler & Gasson, 2005). According to the newest theoretical model of self-esteem the physical self belongs to the non academic part of personality (hierarchical-multidimensional model; Shavelson, Hubner & Stanton, 1976). The physical self includes several components, from physical appearance, to perceived competence in the motor domain, activity level, health issues, etc. (e.g. Marsh et al., 1994; Fox, 1990) A subcomponent of physical self that has been particularly studied is body image, that is the human experience of embodiment (Cash & Pruzinsky, 2002). There are two ways to measure body image: a. overall body image, that usually refers to general appearance features and b. perceptions about the weight and shape of the body of children. The second type of measure is more often assessed and the results are in favor of a body dissatisfaction of children, especially of girls as they grow older (Field et al., 1999). Although the causal relationships between negative body image and particular psychiatric problems have not been adequately proved; yet it is evident that negative body image in children is related to specific psychiatric problems, such as depression and different kinds of eating disorders (Ricciardelli & McCabe, 2001). Nevertheless, 'normative' body dissatisfaction of children and risk factors that lead to psychopathology should be distinguished. For this reason assessment tools with good psychometrics should be used by professionals in the identification process of the above situations, as negative body image of adolescents or adults and its consequences can be traced in childhood (Smolak, 2002).

The confusion in the literature with the terms that are related to the physical self (physical self-esteem, physical self-concept, body image etc.) can be excused regarding the multidimensionality of it. For an appropriate measurement of physical self and its subcomponents the different aspects should be taken into account as it consists of: perceptual, evaluative/attitudinal, cognitive, affective and behavioural components (Bane & McAuley,

1998; Smolak, 2004). Some assessment tools of physical self attempt to gather information about the accuracy of perceptions of children concerning their body size (specific body parts or whole-body), while some others ask them about some other aspects of physical self, such as their perceived physical competence, appearance, strength, flexibility, coordination, endurance, health quality or motor activity (Marsh et al., 1994). The most well studied aspect of physical self is the evaluative/ attitudinal one. According to the 'discrepancy theory', the difference between the actual and ideal body image indicates the person's body dissatisfaction (Marsh et al, 2007). Moreover, numerous instruments have been developed to assess the cognitive component of body image. These assessment tools extract information such as existing body image schemas (e.g. 'thinness schema') (Smolak, 2004), controllability of weight, stereotypes concerning body ideals or children's perceptions about environmental influences concerning the body. Together with the above the emotional aspects (such as anxiety, dejection and other negative feelings concerning the physical self) are being measured with some instruments (Bane & McAuley, 1998). Finally, body image is such an intrapsychic phenomenon (Thompson & Van Den Berg, 2002) that there is not a more direct way to assess the behavioural aspect, than asking participants about their behaviour concerning their body and other physical issues, such as investment in appearance, eating patterns or exercise habits.

The above mentioned aspects are measured with different techniques (questionnaires, associative techniques, constructive techniques, figure scales, interviews etc.). This paper will limit the description and analysis into the questionnaires. The questionnaires are self-referent tests that although many data can be obtained from the different items in short time, still the questions need to be reliable and valid when applied especially to young children. This kind of measurement is most preferable by researchers as it is easy and quick to complete and evaluate. This is why most of the instruments that have been developed to assess the physical self are questionnaires.

The objectives of the current study are: a) to detect current questionnaires that measure the physical self or some components of it in children and b) to discuss several psychometric and content- characteristics regarding the ones that are more focused on the physical self as a whole, so as to inform the readers for the different possibilities according to the use they want to make.

Methods

Literature Search

The literature review for this study was divided into two phases. The process began with a quite broad investigation of the literature according to some criteria and then became more focused through the next phase.

Phase 1. This phase includes searching of assessment tools of physical self for children. The inclusion/ exclusion criteria for the first phase were:

A. Concerning the participants, the tests had to have been developed for children until 12 years of age and could be applied to the general population as well (not very disorder-specific; e.g. Cystic Fibrosis Questionnaire- CFQ Child P).

B. Concerning the types of instruments:

1. Assessment tools that measured the physical self as a part of the global self were excluded, e.g. Piers-Harris Children's Self Concept Scale, Piers (1969), Tennessee Self Concept Scale for children (Fitts, 1965) etc.
2. From the existing psychometric instruments only the questionnaires which evaluate the physical self were taken into account.

3. Assessment tools of physical self that refer specifically to elite athletes (e.g. Elite Athlete Self-Description Questionnaire), that are exercise-specific (e.g. Free-throw self efficacy scale), sport-specific (e.g. Perceived Soccer Competence Subscale) or nationality-specific (e.g. Acculturation-Rating-Scale-of-Mexican-Americans) were excluded. Additionally, only self-referent tests were selected; that is observation tools by others- teachers, parents (e.g. ECOMI, children's motor competence observation scale) were not included (phenomenological instead of observational approach).
4. Questionnaires had to have been developed from 1992 onwards, as before this date another review of the most commonly used questionnaires that measure body image aspects in children has been already published (Gardner, 2002).

C. Concerning the literature sources (articles): The instruments were selected from articles that are published from 2001 until April 2007. Moreover, the articles or the abstracts of the articles in which the instruments were found had been written and published in the English language.

Phase 2. After the initial literature review, 15 results were obtained that met the inclusion criteria for phase 1. These measures were reviewed a second time to narrow the focus of the literature review to the ones that assess at once most of the aspects of the physical self and not only the very specific components of it (e.g. body image dissatisfaction). In this phase the psychometric features of the instruments were searched more in depth, so as to make a complete description and analyses of them later on. Therefore, evidence for the validity of these instruments has also been included.

Search methods

The sources of literature for the review were found in computer searches from PsychInfo, which was investigated thoroughly. The results were obtained by searching matches of the key words below: i) physical self, physical self esteem, physical self concept, body image, perceived motor competence, subjective motor competence, ii) assessment, evaluation, measurement, instruments, scale, test and iii) child.

Data collection and analysis

Articles were examined from their abstracts (or full-text indications). Instruments were identified as appropriate for this review initially from their titles. (If there were doubts further investigation was being conducted). During the first phase, when an questionnaire was being detected from the literature, an investigation of the initial source of this instrument and more information about its psychometric properties was made from a general internet search machine ('google scholar' through www.kuleuven.be). This was made by entering as key words the title and the author of the instrument. When the initial study was not found, then the psychometric properties of another study that used the same instrument was noted. During the first phase the following information of each instrument was kept: title of the questionnaire, name of the authors, year of publication, a short description, reliability data, age range of the initial sample, number of the standardization sample and some comments concerning the character of the different components that are evaluated by the measure. During the second phase some more information from the final selection of instruments, like validity data, were searched.

Results

During the first phase of the review 15 questionnaires for physical self or related aspects of children, younger than 12 years of age, developed after 1991, were found (Table 1). The above measurement tools which were found in the literature assess either more integrative factors of the physical self or eating history and behaviour, body esteem, body dissatisfaction, weight concerns, eating disorders' risk factors, teasing concerning appearance from the environment, perception of the body, or even more specialized issues like barriers to motivation for exercise or quality of life aspects related to appearance.

Most of the factors of the physical self in one integrative instrument were measured exclusively through the following questionnaires: Physical Self Concept Inventory (Chung, 1996), Children's Physical Self-Concept Scale (Stein et al, 1998), Children and Youth Physical Self Perception Profile (Whitehead, 1995) and Physical Self Description Questionnaire (Marsh et al, 2007) (description of the above tests is found in the second part of the study).

Although in the selection criteria the 'medical disorder-specific' instruments were excluded, a big amount of them referred to eating disorders' symptomatology, and these were also cited in the table. Meanwhile, most of them can be applied to the general population as well. Thus, many instruments are focused on eating disorders' diagnosis or risk factors concerning these disorders or other psychiatric disorders (e.g. depression). More specifically some of them have been developed in order to detect specific psychopathology of eating disorders (Kid's Eating Disorders Survey, Childress, Jarrell & Brewerton, 1993; Eating Behaviours and Body Image Test, Candy & Fee, 1998 and Child Eating Disorders Examination for Children, Bryant-Waugh et al., 1996). Moreover, quite many of them assess some risk factors concerning eating disorders, such as: eating history and behaviours (e.g. Family History of Eating-version of children, Moreno & Thelen, 1993 and Emotional Eating Scale, adapted for use for children, Tanofsky-Kraff et al., 2007), teasing experiencing from others (Perception Of Teasing Scale, Thompson et al., 1995; Inventory of Peer Influence on Eating Concerns, Oliver & Thelen, 1996 and Appearance Teasing Inventory, modified for use with children, Hayden-Wade et al., 2005), weight concerns, stereotyping and anti-fat prejudice (e.g. Stanford weight concerns' scale, Killen et al., 1994; Tiggemann & Wilson-Barrett's silhouette drawings questionnaire, 1998 and Weight-Specific Quality of Life in School Children, Warschburger, Fromme & Petermann, 2004). Also the Revised version of Body Esteem Scale (Mendelson, White & Mendelson, 1996) was measuring most of the aspects of body esteem at once (appearance, perceived appearance by others, weight concerns etc). Lastly, another scale that measures a specific component of physical self (barriers to motivation for exercise), different from the others, is the Exercise Barriers Self-Efficacy Scale for Children (Annesi et al., 2005).

Apart from the above categorization of instruments of physical self for children concerning their content, another classification can be made according to the different components of the multidimensional concept of physical self. Several questionnaires measure the attitudinal factor of physical self or body image, while others focus on the perceptual factor. Additionally, the cognitive, affective or behavioural factors are highlighted more or less in every test. A cataloguing of this aspect is made in the last column of Table 1.

Beside the content, some information about the psychometric properties of the assessment tools that fulfilled the initial criteria has been found. Reliability data were not found for all the instruments, at least until this point of search; nevertheless test-retest measures and internal consistency of some of them are mentioned (in 12 from the 15 measures) in Table 1.

Table 1a: Questionnaires that evaluate the Physical Self of children under 12 years and related concepts.

Title	Authors	Short description	Reliability	Age range	Standardization sample/ Norms	Other data and comments
Family History of Eating-version for children (FHE-child)	Moreno and Thelen, 1993	5-point Likert-scale; is used to assess attitudes concerning body shape and weight, dieting, and familial eating patterns and behaviors	In Phares, Steinberg & Thompson's (2004) study: coefficient alpha = .80	For the study mentioned mean age: 9.23 years old		Attitudinal
Revised version of Body Esteem Scale (R-BES)	Mendelson, White & Mendelson, 1996	24-item scale; measures nonspecific items related to appearance, perceived appearance by others, weight concerns etc.	IC from study of Davison and Birch, 2002: $\alpha = .73$ (age 5) and $\alpha = .84$ (age 7)	5 and 7 years old in the study mentioned		Attitudinal (appearance and body dissatisfaction)
Kids' Eating Disorders Survey (KEDS)	Childress et al, 1993	14 items assesses the presence of eating disorders symptoms on 2 subscales: Weight Dissatisfaction and Purging/Restricting Behavior	good internal consistency and test-retest reliability	Grade 5 to grade 8	3,175 children (48,9% male, 51,1% female)	Attitudinal and behavioral components; Use for identification and prevention of eating disorders
Exercise Barriers Self-Efficacy Scale for Children	Annesi, 2005	10-item inventory, assesses exercise barriers self-efficacy or the degree one believes he or she possesses the ability to overcome social, personal, and environmental barriers to participating in exercise	Cronbach $\alpha = .79$, test-retest reliability over 1 week: 0.77 (in Annesi, 2005)	9-12 years old (in Annesi, 2005)		Theoretical background: self-efficacy theory Cognitive (barriers, motivation etc.), affective (personal barrier)
Physical Self-Concept Inventory (PSCI)	Chung, 1996	29-items; six-point Likert-type scale; items cover flexibility, endurance, appearance, agility, obesity and strength	Cronbach $\alpha = .88$	9-12 years of age	309 children, Taiwan	Perceptual, multidimensional physical self
Children's Physical Self-Concept Scale (CPSS)	Stein et al, 1998	27-item; assesses Global physical self-concept and subscales of Physical Performance, Physical Appearance, and Weight Control behaviors	adequate test-retest reliability and internal consistency	6 to 11 years of age	316 children	Multidimensional physical self, behavioural patterns, perception about appearance
Eating Behaviors and Body Image Test (EBBIT)	Candy & Fee, 1998	61-items; 4 point Likert scale; assesses body image dissatisfaction/restrictive eating behaviour and binge eating behaviors	test-retest (in 2 weeks) .90 and 0.79 for the 2 factors in 70 girls (subsample)	fourth, fifth and sixth grade	291 girls	Attitudinal, Behavioral patterns

Table 1b: Questionnaires that evaluate the Physical Self of children under 12 years and related concepts.

Title	Authors	Short description	Reliability	Age range	Standardization sample/ Norms	Other data and comments
The Perception of Teasing Scale (POTS)	Thompson et al, 1995	11 items, 5 point-Likert scale, assesses weight and competency related teasing	acceptable IC and reliability. In the study Hayden-Wade et al, 2005: cronbach $\alpha = .95$ and $\alpha = .85$ (initial's study sample was college women)	In Thompson et al (1995), 10-14 years		Teasing from parents. Cognitive, affective, perception of parents' attitudes
Inventory of Peer Influence on Eating Concerns (IPIEC)	Oliver & Thelen, 1996	30-item measure of peer influence on children's eating and body shape concerns; consists of 5 factors: Messages, Interactions/Girls, Interactions/Boys, Likability/Girls, and Likability/Boys	In the study Phares et al, 2004 cronbach $\alpha = .94$	In Oliver & Thelen (1996) mean age 9.23 years		Teasing from peers. Cognitive, affective and perceptions of peer's attitudes
Stanford Weight Concerns Scale	Killen et al, 1994	assesses weight and shape concerns and behaviors; 5 questions; scores are normalized to a 100 point scale	test-retest (12 months) $r = .75$	six and seven grade students		Cognitive, affective and attitudinal components
Children and Youth Physical Self Perception Profile (CY-PSPP)	Whitehead, 1995	36-item scale; measures 5 components of physical self (sport competence, physical conditioning, body attractiveness, physical strength, physical self worth) and global self; 6 questions for the 6 components; 5-point pictorial scale	In Welk et al (1997), IC from .73 to .91	In Welk et al (1997) forth and fifth grade students		Perception of physical self. Multidimensional-hierarchical model of self esteem. Cognitive, affective, evaluative/attitudinal components
Weight-specific quality of life in school-children (GW-LQ-KJ)	Warschburger, Fromme & Petermann, 2004	assesses weight quality of life				only abstract, article in German

Table 1c: Questionnaires that evaluate the Physical Self of children under 12 years and related concepts.

Title	Authors	Short description	Reliability	Age range	Standardization sample/ Norms	Other data and comments
Tiggemam and Wilson-Barrett's silhouette drawings questionnaire	Tiggemam & Wilson-Barrett, 1998	1st section: elicits the presence of stereotyping of weight for the children's sex and for the opposite sex (which child is friendlier, happier, lazier, attractive, confident, smarter, healthier, best etc - 11 items); 2nd section: assesses controllability of children's personal weight	In Anesbury & Tiggemam's study: 1st section: time 1: Cronbach α females .85, males .86, time 2: Cronbach α females .90, males .86; 2nd section: time 1: α = .64, time 2: .87			Cognitive
Emotional Eating Scale, adapted for use for children (EES-C); adaptation from EES, Arrow, Kenardy & Agras, 1995	Tanofsky-Kraff et al, 2007	26-item questionnaire; 5-point scale with one added frequency scale; three factors: eating in response to anxiety, anger, and frustration (EES-CAAF), depressive symptoms (EES-C-DEP), and feeling unsettled (EES-C-UNS)	IC: 0.95, 0.92, and 0.83 and stability: EES-C-AAF .59, EES-C-DEP .74, EES-C-UNS .66 at $p < 0.001$	8-17 years	159 children and adolescents	Affective and behavioural components
Physical Self Description Questionnaire (PSDQ) used with children under 12 years old (original study: Marsh et al, 1994)	Marsh et al., 2007	70-items scale; measures 11 components: global physical self, global self-esteem and 9 components of physical self: appearance, strength, condition/endurance, flexibility, health, coordination, activity, body fat and sport competence; 6 or 8 points Likert scale	Reliability estimates for the total sample (α = .66 to .93; Md = .74)	5-17 years	763 Hong Kong children (347 girls, 416 boys)	Perception of physical self. Multidimensional-hierarchical model of self-esteem. Cognitive, affective, evaluative/attitudinal components

IC: internal consistency

For most of them reliability evidence is acceptable, except for some that have low stability and some others that do not mention exact psychometric data, but only point out that they were adequate. Further and more in depth analysis need to be made for these instruments. About the age range of the children that the instruments have been developed for, very few of them (e.g. Physical Self Description Questionnaire, Marsh et al., 2007 and Emotional Eating Scale, adapted for use for children, Tanofsky-Kraff et al, 2007) refer to a

broad age range (5-17 years old and 8-17 years old correspondingly for the tests mentioned above). Most of them are applied to a small age range of children (two to four years). Also the youngest age of children that the tests are applied is five years old (Revised version of Body Esteem Scale, Mendelson, White & Mendelson, 1996). Concerning the second research question, from the 4 instruments that have been found to assess the physical self more integratively, only the 3 will be described here as there was not found adequate information about the Children's Physical Self-Concept Scale (Stein et al, 1998).

Children and Youth Physical Self Perception Profile (CY-PSPP) (Whitehead, 1995)

The CY-PSPP is a questionnaire which is consisted of 36 questions, 6 questions for each of the five scales of it (sport competence, physical conditioning, body attractiveness, physical strength, physical self-worth) and 6 questions for a global measure of self-esteem written in a 4-point structured alternative format. The child has to determine which of the two hypothetical children he or she is most like and then decide if the statement is really true or just true for him or her. This instrument is a slightly modified version of the Physical Self Perception Profile developed by Fox and Corbin (1989) and is adapted for use of children. Both tests consider the structure of physical self to be hierarchical and multidimensional. The CY-PSPP provides valid and reliable information for children as young as 9 or 10 years old. Construct validity was supported by correlating the CY-PSPP subdomains and objective measures of fitness (in 54 boys and 54 girls of the total sample of 152 children from rural Midwestern town). About the test-retest reliability, the comparisons of the 4 subdomains was $r_{tt} = .78$, but exceptionally there were found low scores for physical self worth ($r_{tt} = .50$) and self esteem ($r_{tt} = .30$) only for the boys. Finally the internal consistency of the subdomains varied from $\alpha = .73$ to $\alpha = .91$.

Physical Self Description Questionnaire (PSDQ) (Marsh et al., 2007)

The PSDQ is a questionnaire which consists of 70 items designed to measure 9 specific components of physical self concept, global physical self concept and global self esteem. Each item is a simple declarative statement in which responses vary along a 6-point true/false response scale. The PSDQ is based on the hierarchical-multidimensional model of self concept. The original scale (Marsh et al., 1994) was used for adolescents above 12 years of age. Hau, Sung, Yu and Lau (2002) evaluated the appropriateness of the original PSDQ in a sample of younger Chinese children with ages between 7 and 15 years old and they found that the factor solution based on this sample was well defined with parameters (factor loading and correlations) consistent with the original model. Marsh et al. (2007) provide clear support for the convergent and discriminant validity of PSDQ responses in terms of objective measures of body composition (BMI and % fat) and Silhouette Matching Task body image ratings, as well as the psychometric properties of the instrument for 8-15 years old Hong Kong students. So, this research supports the validity of PSDQ in a non-Western sample, with obese (clinical diagnosed and undiagnosed) and non-obese children, boys and girls, younger in age than in the original scale. The results from the above research prove that each of the PSDQ scales has acceptable levels of reliability (Cronbach α) for the total sample of Chinese students as well as for subsamples differing in relation to gender, age and obesity status. Although reliability estimates for the total sample are $\alpha = .66$ to $\alpha = .93$ ($Md = .74$), data from general research in self concept (e.g. Marsh, 1989) suggest that reliability is somewhat lower for younger children aged 7-9 than children aged 10-11 and 12-15.

Physical Self-Concept Inventory (PSCI) (Chung, 1996)

In Taiwan, Chung (1996) modified the Physical Self-Description Questionnaire (PSDQ) developed by Marsh and Redmayne (1994) and combined it with Fox's (1990) Physical Self Perception Profile to create a 29-item Physical Self-Concept Inventory (PSCI) to measure the physical self concept of school-age children. The answers are recorded along a 6-point Likert-type scale. Higher scores indicate more positive physical self-concept. The items cover the following subdomains of physical self-concept: flexibility, endurance, appearance, agility, obesity and strength. Chung (1996) reported a Cronbach's α of 0.88 and construct validity of the instrument with Taiwanese children. Chiang et al. (2005) re-examined the instrument's construct validity via confirmatory factor analysis using AMOS (5.0) (Byrne, 2001). This six-factor measurement model revealed a goodness-to-fit index (GFI) of 0.93, a root mean square error of approximation (RMSEA) of 0.05 and a χ^2 (362) $P < 0.01$. The GFI for the model was calculated as 0.93, indicating that approximately 93% of the variance in the data could be explained by the model. These calculations were done on 429 Taiwanese children (120 with asthma and 309 healthy children) with age range from 9-12 years.

Discussion

The purpose of this study was to search for questionnaires of physical self esteem or relevant issues for children until 12 years old. The initial idea was to find the ones which were independent from other general measures of self esteem and were measuring exclusively the physical aspects of self esteem. After the first phase 15 results were obtained, that met the inclusion criteria. As it is showed in table 1 most of the questionnaires ($n= 11$) of physical self that exist in the literature were referring to body image and eating behaviors of children. The results give evidence for the tendency of the researchers who study the physical self to specify to the assessment of the body image. They confirm the references of Smolak (2002) in the importance of body image assessment (especially in children with depression and eating disorders). While the initial intention was to detect questionnaires of physical self, the second aim of the current review was to specify and discuss the measurements for total physical self ($n= 4$).

Previous reviews (Bane & Mc Auley, 1998; Smolak, 2004) have used several categorizations to characterize the different aspects that the instruments of physical self measure (perceptual, attitudinal, emotional, cognitive, behavioral). In the present review the instruments that were found measured the same aspects and these categorizations were made in the correspondent column (comments) of table 1. As mentioned in the introduction the most well studied factor of body image is the attitudinal/ evaluative one, which was partially found in this study as well (7 of the 15 questionnaires). The number of the instruments that evaluate the above factor would be higher if other techniques that measure body image (e.g. figure scales) would be taken into account. Moreover, the perceptual component is always measured in questionnaires, as this is the nature of this technique; to ask the children what they think about some aspects of their physical self or their behavior concerning these aspects. Therefore, this component is considered here to be the most frequent studied. Regarding the content of the tests, consistent with the information the user wants to acquire, they include a variety of choices (see the relevant reference in the results). For example in psychomotor therapy or in similar interventions or educations ameliorating the physical self is a vital target. As this intervention works by considering the three aspects of human personality (motor, cognitive and social-affective) so as to influence the behavior (Simons, 2004), depending on the aspect of physical self that the professionals want to tap on, they can administer the most appropriate instrument.

From the total amount of tests found only 3 are described in the second part of the study as these measure the different aspects of the physical self in one instrument. Maybe in a future research the questionnaires which assess the physical self esteem as a part of the general self esteem should also be included so as to gather more of them and discuss between a greater variety of those. However these 3 are very representative and give enough information to the potential users.

All three questionnaires which measure the physical self are multidimensional, which adheres to the findings of Marsh et al. (2006) who found that children differentiate between multiple dimensions of self-concept at even the age of 4. According to Fox (1990) and Lintunen (1999), who mentioned that children's perceptions about themselves are more undifferentiated we could expect that studies would use unidimensional models of physical self for children, something which was not found. Concerning the reliability, all three tests showed acceptable internal consistency, which is a good indication for every use of the tests. Nevertheless, Marsh et al. (2007) found lower reliability in 7-9 year old children in comparison to older children. Moreover, factorial validity was supported for all three assessment tools. Validity in a bigger range of age (8-15 years old) was tested with the PSDQ (Marsh et al. 2007); while researchers should do the same for the other 2 tests in order to defend their psychometric value. In the same way the tests should be further developed by applying them in other populations (e.g. different ethnicities, non clinical as well as clinical). However, PSDQ (Marsh et al. 2007) and PSCI (Chung, 1996) were validated in Western and non-Western populations as well as clinical and non clinical populations (obese and asthmatic children correspondingly). Finally, there is not much research in children younger than 7-8 years old, which is very important as early detection of some kinds of problems may offer a good prognosis for future problems (eating disorders, depression or other). Therefore, at least the instruments of physical self esteem that were mentioned here should be used with young children, by taking into account their developmental level, and make the appropriate adaptations.

Conclusions

The most frequent component of physical self of children that is measured in the literature as a separate test format is body image, while quite many of the instruments are developed in order to detect eating disorders at young ages. The instruments that measure the physical self as such use multidimensional models even in very young children. Moreover, most of the questionnaires assess the perceptual component of the different aspects of the physical self as well as the attitudinal one. Finally as some tests use also the other aspects of physical self, such as the cognitive, the emotional and the behavioral one, they can be consequently applied in cognitive-behaviorally oriented interventions.

References

- Annesi J. J. (2005). Relations of physical self-concept and self-efficacy with frequency of voluntary physical activity in preadolescents: Implications for after-school care programming. *Journal of Psychosomatic Research*, 61, 515– 520.
- Bane & McAuley. Body image and exercise. Chapter 17. In Duda, J. L. (1998) *Advances in Sport and Exercise Psychology measurement*. Fitness Information Technology. Inc. Morgan Town.
- Bryant-Waugh R, Cooper PJ, Taylor CL, Lask BD. (1996). The use of the eating disorder examination with children: a pilot study. *International Journal of Eating Disorders*, 19, 391 – 397.

- Butler, R. J. & Gasson, S. L. (2005). Self esteem/self concept scales for children and adolescents: A review. *Child and adolescent mental health, 10, No 4*, 190-201
- Candy, C. M. & Fee, V. E. (1998). Underlying Dimensions and Psychometric Properties of the Eating Behaviors and Body Image Test for Preadolescent girls. *Journal of Clinical Child Psychology, 27, No 1*, 117-127.
- Cash, T. & Pruzinsky, T. (2002). Body image. A handbook of theory, research and clinical practice. The Guilford Press. New York. London.
- Childress AC, Brewerton TD, Hodges EL, Jarrell MP. (1993). The Kids' Eating Disorders Survey (KEDS): results from a survey of middle school students. *Journal of the American Academy of Child & Adolescent Psychiatry, 32*, 843-850.
- Childress A. C., Jarrell M. P., Brewerton T. D. (1993). The Kids' Eating Disorders Survey (KEDS): internal consistency, component analysis, and reliability. *Eating Disorders 1*, 123-133.
- Chung B. F. (1996) The Construct of Physical Self-Concept and its Relations to Construct of Physical Fitness among Children. Thesis, National College of Physical Education and Sports, Taiwan, China. In Chiang, L. C., Huang J. L. & Fu, L. S. (2005). Physical activity and physical self-concept: comparison between children with and without asthma. *Journal of Advanced Nursing, 54(6)*, 653-662.
- Field, A., Camargo, C, Taylor, C., Berkey, C., Frazier, L., Gilman, M., & Golditz, G. (1999). Overweight, weight concerns, and bulimic behaviors among girls and boys. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 754-760.
- Fitts, W. H. (1965). *Tennessee Self Concept Scale*. Nashville, TN: Counselor Recordings and Tests.
- Fox, K. R. (1990). The Physical Self-Perception Profile Manual, Northern Illinois University, Office for Health Promotion, Jerald, D.
- Gardner, R. M. Body image assessment of children. In Cash, T. & Pruzinsky, T. (2002). Body image. A handbook of theory, research and clinical practice (pp. 127-134). The Guilford Press. New York. London.
- Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F., Wilfley, D. E. (2005). Prevalence, Characteristics, and Correlates of Teasing Experiences among Overweight Children vs. Non-overweight Peers. *Obesity Research, 13*, 1381-1392.
- Killen, J. D., Taylor, C. B., Hayward, C., Wilson, D. M., Hammer, L. D., Robinson, T. N., Litt, I., Simmonds, B. A., Haydel, F., Varady, A. & Kraemer, H. C. (1994). The pursuit of thinness and onset of eating disorder symptoms in a community sample of adolescent girls: A three-year prospective analysis. *International Journal of Eating Disorders, 16*, 227-238.
- Lintunen, T. (1999) Development of self-perceptions during the school years. In Y. Vanden Auweele, F. Bakker, S. Biddle, M. Durand, R. Seiler (Eds.). *Psychology for physical educators*. Champaign, IL: Human Kinetics, pages 115-133.
- Marsh, H. W., Richards, G. E., Jonson, S., Roche, L., & Tremayne, P. (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology, 16*, 270-305.
- Marsh, H. W., Hau, K. T., Sung R. Y. T., Yu, C. W. (2007). Childhood Obesity, Gender, Actual-Ideal Body Image Discrepancies and Physical Self-concept, in Hong Kong Children: Cultural Differences in the Value of Moderation. *Developmental Psychology, 43(3)*, 647-662.
- Marsh, H. W., Tracey, D. K. & Craven, R. G. (2006). Multidimensional Self-Concept Structure for Preadolescents With Mild Intellectual Disabilities. A Hybrid Multigroup-MIMC Approach to Factorial Invariance and Latent Mean Differences. *Educational and Psychological Measurement, 66, No. 5.*, 795-818.
- Mendelson, B. K., White, D. R., & Mendelson, M. J. (1996). Self-esteem and body esteem: Effects of gender, age and weight. *Journal of Applied Developmental Psychology, 17*, 321-346.
- Moreno, A., & Thelen, M. H. (1993). Parental factors related to bulimia nervosa. *Addictive Behavior, 18*, 681-689.
- Oliver, K. K., & Thelen, M. H. (1996). Children's perceptions of peer influence on eating concerns. *Behavioral Therapy, 27*, 25-39.

- Piers, E. V. (1969). *Manual for the Piers-Harris Children's Self Concept Scale*. Nashville, TN: Counselor Recordings and Tests.
- Ricciardelli, L., & McCabe, M. (2001). Children's body image concerns and eating disturbance: A review of the literature. *Clinical Psychology Review, 21*, 325-344.
- Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research, 46*, 407-441
- Simons, J. (2004). Uitgangspunten. In *Introductie tot de psychomotoriek (Introduction of the psychomotor therapy)*, pages 17-24. Garant. Antwerpen/ Apeldoorn.
- Smolak, L. Body Image Development in Children. In Cash, T. & Pruzinsky, T. (2002). *Body image. A handbook of theory, research and clinical practice* (pp. 65-73). The Guilford Press. New York. London.
- Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image, 1*, 15-28.
- Stein, R. J., Bracken, B. A., Haddock, C. K., Shadish, W. R. (1998). Preliminary development of the Children's Physical Self-Concept Scale. *Journal of developmental and behavioral pediatrics 19 (1)*, 1-8.
- Tanofsky-Kraff, M., Theim, K. R., Yanovski, S. Z., Bassett, A. M., Burns, N. P., Ranzenhofer, L. M., Glasofer, D. R. Yanovski, J. A. (2007). Validation of the Emotional Eating Scale Adapted for Use in Children and Adolescents (EES-C). *International Journal of Eating Disorders, 40*, 232-240.
- Thompson, J. K. & Van Den Berg, P. Measuring Body Image Attitudes among Adolescents and Adults. In Cash, T. & Pruzinsky, T. (2002). *Body image. A handbook of theory, research and clinical practice* (pp. 142-154). The Guilford Press. New York. London.
- Thompson J. K., Cattarin J., Fowler B., Fisher E. (1995). The perception of teasing scale (POTS): a revision and extension of the physical appearance-related teasing scale (PARTS). *Journal of personality assessment, 65*, 146-57.
- Tiggemann, M. & Wilson-Barrett, E. (1998). Children's figure ratings: relationship to self esteem and negative stereotyping. *International Journal of Eating Disorders, 23*, 83-88.
- Warschburger, P., Fromme, C. & Petermann, F. (2004). Weight-specific quality of life in school-children: Validity of the GW-LQ-KJ. *Zeitschrift für Gesundheitspsychologie, 12. Jg., Heft 4*, 127-129..
- Whitehead, J. R. (1995). A study of children's physical self perceptions using an adapted Physical Self-Perception Profile questionnaire. *Pediatric Exercise Science, 7*, 132-151.