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A validation study of the Physical Self-Description Questionnaire for Children (PSC-C)

Introduction

The Physical Self-Description Questionnaire (PSDQ; Marsh, Richards, Johnson, Roche, & Tremayne, 1994) is one of the most frequently used instruments for the assessment of physical self-concept, designed for adolescents of age 12 years or older. It is a 70-item instrument designed for the measurement of 11 components of physical self-concept. As far as we know, there is no validated version of the PSDQ for children from the age of 10 and older. The aim of this study was to develop a version for children aged between 10 and 12 which also considers the cognitive abilities and language skills of children and is connectable to the PSDQ, allowing for a more differentiated assessment of childrens' self-perception of their physical self-concept and on processing issues.

Methods

The structure of the PSDQ was maintained for the lower level behavior-related factors (endurance, coordination, strength, flexibility, appearance, sports competence) supplemented by velocity for evaluation purposes. All negatively formulated items and items which called for a social comparison process were eliminated (Table 1). The complexity of the written language was adapted and a 4-point rating scale was utilized instead of the original 6-point rating scale. Two studies were conducted: study 1 ($n=255$, grade 3, girls: 45.5%, $M_{age}=9.27$, $SD=.54$) for an exploratory factor analysis with categorical data estimator and study 2 ($n=349$, grade 3; girls: 45.4%, $M_{age}=8.75$, $SD=.50$) for a confirmatory factor analysis, (data was extracted from an interventions study: Naul, Schmelt, Dreiskaemper, Hoffmann & l'Hoir, 2012).

Table 1: Item PSC-C

item-position	Item German [english]	subscale
6	Ich bin gut in Sport. [I have good sports skills]	sport competence
10	Ich kann die meisten Sportarten gut. [I am good at most sports]	sport competence
16	Ich mache gerne Sport. [I like sport]	sport competence
7	Ich mag Fotos von mir. [I like pictures of me]	appearance
13	Ich sehe gut aus. [I am good looking]	appearance
19	Ich schaue gern in den Spiegel. [I like to look in the mirror]	appearance
2	Ich kann lange laufen, ohne müde zu werden. [I can run for a long way without stopping]	endurance
8	Ich kann mich lange anstrengen.[I can push myself for a long time]	endurance
18	Ich kann lange herum toben, ohne müde zu werden. [I can be physically active for a long time without getting tired]	endurance
4	Ich bin beweglich.[My body is flexible]	flexibility
9	Ich bin gelenkig. [My body is agile]	flexibility
15	Ich kann mich gut in alle Richtungen biegen. [I am good in bending my body in any direction]	flexibility
5	Ich kann meine Bewegungen leicht steuern und lenken. [I find my body handles coordinated movements with ease]	coordination
14	Meine Bewegungen sehen schön aus. [I am graceful when I do sports]	coordination
21	Ich kann gut balancieren. [I am good at balancing]	coordination
11	Ich bin stark. [I am a physically strong person]	strength
11	Ich habe viel Kraft in meinem Körper. [I have a lot of power in my body]	strength
17	Ich kann schwere Dinge leicht hoch heben. [I am good at lifting heavy objects]	strength
3	Ich bin schnell. [I am quick]	velocity
12	Ich bin gut im 50 m Sprint. [I am good at 50m run]	velocity
20	Ich kann schnell laufen.[I can run fast]	velocity

Additionally, a motor ability test-battery (extracted from the NRW-Motor-Test, IM NRW 2009; DMT 6-18, Bös et al., 2009) was applied to test the divergent validity. The test items are recommended by the German Society of Sport Science for assessing general fitness of children between the age of 6 to 18 and are used for testing school kids in North-Rhine-Westfalia. This test battery includes eight tests covering condition and coordination (e.g., side to side jumps, six-minute run), as well as flexibility as part of the passive energetic system. It is a frequently used test-battery, particularly in German primary schools.

References

Bös, K., et al. (2009). *Deutscher Motorik Test 6-18*. Hamburg: Czwalina.
IM NRW (2009). *Motorischer Test für Nordrhein-Westfalen*. Düsseldorf: Landesregierung NRW.
Marsh, H. W., Richards, G. E., Johnson, 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 & Exercise Psychology*, 16(3), 270-305.
Naul, R., Schmelt, D., Dreiskaemper, D., Hoffmann, D. & l'Hoir, M. (2012). 'Healthy children in sound communities' (HCSC/gkgk) - a Dutch-German community-based network project to counteract obesity and physical inactivity. *Family Practice*, 29 (Suppl 1).

Results

Study 1: The exploratory factor analysis (MPLUS, WLMSVA with oblique GEOMIN-Rotation) showed a seven factor solution (strength, endurance, velocity, flexibility, appearance, sports competence, coordination 60.35% , $\chi^2 = 122.52$, $df = 84$, $p = .004$, $RMSEA = .042$, $CFI = .990$, $TLI = .975$, α 's between .54 and .79).

Study 2: The CFA showed good model fits for the seven factor solution (Study 2: $\chi^2 = 393.432$, $df = 168$, $p < .001$, $RMSEA = .063$, $CFI = .953$, $TLI = .942$). The standardized factor solutions were between $\beta=.55$ and .95, α 's between .57 and .81, r 's between .38 and .87.

Significant relationships with gender, BMI as well as motor ability tasks confirmed the external validity of the PSC-C test scores. Test invariance for gender was analyzed, therefore factor loadings and threshold parameters were equalized for both groups. The fit indices confirmed a good model fit ($\chi^2 = 666.260$, $df = 385$, $p < .001$, $RMSEA = .066$, $CFI = .946$, $TLI = .941$). Figure 1 shows significant gender differences in most of the subscales strength ($p < .01$), endurance ($p < .01$), velocity ($p < .01$) and sport competence ($p < .01$).

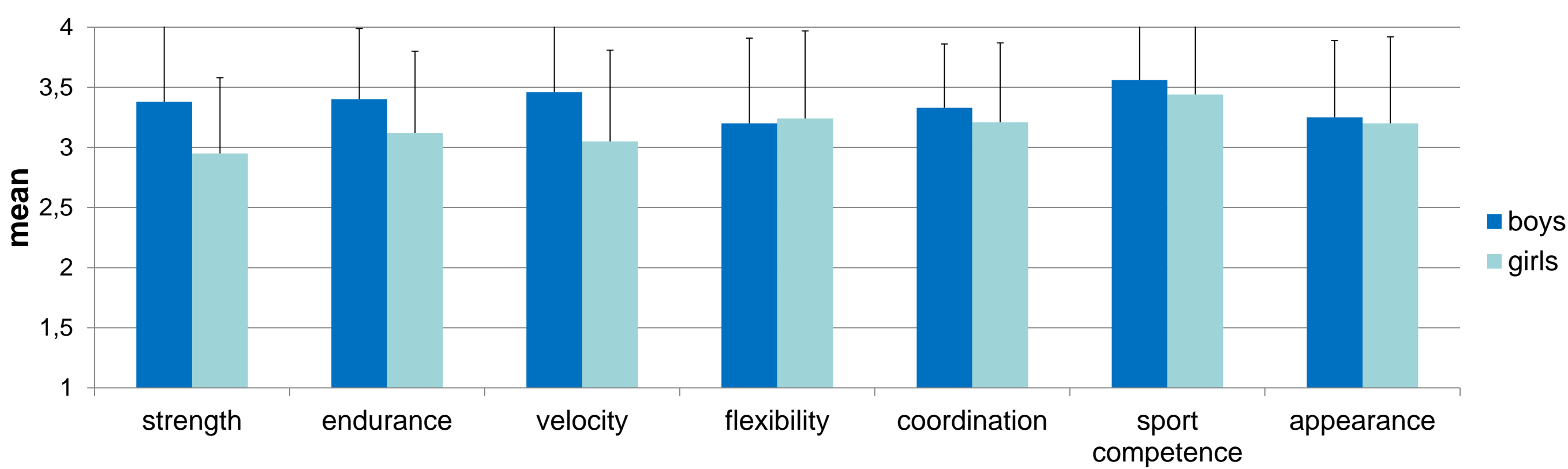


Figure 1: observed PSC-C mean and SD (study 2, n = 339)

The average BMI mean was 17.55 ($SD = 2.99$; $BMI_{boys} = 17.69$, $SD = 3.21$; $BMI_{girls} = 17.36$, $SD = 2.68$). Children with a high BMI showed lower performance rates in motor ability tasks (e.g. velocity: $p < .001$, $r = -.365$). Hence, these children perceived their physical self more negative, except for strength and coordination (Table 2).

Table 2: Correlation motor ability, BMI and PSC-C (study 2, n = 339).

	strength	endurance	velocity	flexibility	coordination	sport competence	appearance
BMI	.10	-.21**	-.37**	-.21**	-.08	-.18**	-.14**
Sit Ups	-.03	.09	.16**	.16**	.03	.16**	-.02
Push ups	.03	.09	.16**	.14**	.17**	.19**	.13*
Long jumps	.17**	.19**	.36**	.21**	.16**	.27**	.07
Side to side jump	.04	.10	.20**	.14**	.06	.24**	.00
Balancing backwards	.11*	.15**	.18**	.03	.07	.14*	.07
6min - run	.10	.24**	.35**	.25**	.09	.31**	.01
20m-sprint	.09	.17**	.43**	.23**	.15**	.28**	.10

Conclusions

Results show that a differentiated physical self-concept can found at an age as early as 9 years. That gender differences can be found; girls have lower sores on most scales, as do children with a high BMI. Nevertheless, some subscales show a lack of internal consistency (appearance and coordination). It remains to be shown whether this is due to a lack of mental presentation at this age.

The PSC-C for children is especially suitable for intervention purposes and substantial studies investigating covariates of physical self-concept, such as gender, BMI, or motor ability. The current studies showed that most of the PSC-C scales can be used in primary school (except for the scale coordination). Possible advantages, but also limitations, of its applicability are further discussed.