Cross-Linguistic Validity of the French and Dutch Versions of the Very Short Form of the Physical Self-Inventory among Adolescents

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Acknowledgements

Preparation of this article was supported in part from a grant from the Australian Research Council (DP140101559) and from the Social Sciences and Humanities Research Council of Canada (430-2012-0091, 435-2014-0909) awarded to the first and second authors.

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This is the final prepublication version of :

Maïano, C., Morin, A. J. S., & Probst, M., (2015). Cross-linguistic validity of the French and Dutch versions of the very short form of the Physical Self-Inventory among adolescents. *Body Image*, 15, 35-39.

Abstract

The study tested the cross-linguistic validity of the Very Short form of the Physical Self-Inventory (PSI-VS) among 1,115 Flemish (Dutch version) adolescents, and a comparison sample of 1,103 French adolescents (French version; from Morin & Maïano, 2011). Flemish adolescents also completed a positively worded reformulation of the reverse-keyed item of the physical attractiveness (PA) subscale. Confirmatory factor analyses (CFA) supported the factor validity and reliability (except for the Dutch PA subscale) of the PSI-VS, and its partial measurement invariance across samples. CFA conducted on the modified version of the Dutch PSI-VS (11 original items plus the positively-worded replacement), presented satisfactory reliability (ω = .67-.89), and was fully invariant across sexes, age groups, and body mass index categories. Additionally, results revealed latent mean differences across sexes and body mass index categories. Therefore, the modified Dutch PSI-VS can be used whenever there is a need for a very short physical self-concept questionnaire.

Key words: BMI categories; Dutch; French; measurement invariance; PSI-VS.

Few physical self-concept (PSC) instruments have been adapted or validated for children and adolescents (Marsh & Cheng, 2012) and the length of available instruments represent a serious drawback for studies involving multiple instruments or assessments. Maïano et al. (2008) thus developed a very short form 12-item version of the Physical Self-Inventory (PSI-VS) for adolescents (see Table S1 in the online supplements). Using a sample of 829 French adolescents Maïano et al. (2008) found support for the factor validity, reliability (ω = .70-.76), and measurement invariance of the PSI-VS. Morin and Maïano (2011a) recently cross-validated the PSI-VS among 1103 French adolescents, and supported its factor validity, reliability (ω = .64-.90), measurement invariance, and convergent validity.

A single study has since examined the psychometric properties of the PSI-VS in another language. Scalas, Morin, Maïano, and Fadda (2013) administered the Italian PSI-VS to a sample of 1121 adolescents and young adults. Results supported the factor validity and measurement invariance of the PSI-VS. The composite reliability of the subscales was also acceptable (ω = .68-.91), except for physical attractiveness (ω = .52). This result appeared related to a single reverse-keyed item (*Nobody finds me good-looking*). Morin and Maïano (2011b) also discussed potential shortcomings of this item in a study of a longer PSI version, leading them to propose replacing this item by a positively-worded alternative (*Everybody thinks that I am good-looking*). Similar problems have already been noted for the Physical Self-Perception Profile (PSPP; Lindwall, Aşçı, & Hagger, 2011) and the Physical Self-Description Questionnaire (PSDQ; Aşçı, Fletcher, & Çağlar, 2009). It is thus probable that this kind of item, more specifically when used to assess physical attractiveness, may be more reactive to language, culture, or social desirability.

Presently, two PSC questionnaires are available in Dutch: the 40-item PSPP (Van de Vliet et al., 2012), and the 70-item PSDQ (Simons, Capio, Adriaenssens, Delbroek, & Vandenbussche, 2012). Unfortunately, the Dutch PSPP has only been examined among Flemish adults, and the Dutch PSDQ has been only investigated in a small sample (N = 206) of adolescents. Consequently, no short or validated instruments are accessible for Dutch-speaking youth. Clearly, the development and validation of a Dutch PSI-VS would facilitate the assessment of the PSC among Dutch-speaking youth, and contribute to its cross-linguistic validity. Additionally, French and Dutch are the two co-

official languages in Belgium, with most residents speaking only one of these languages. Thus, the examination of the measurement invariance of the French- and Dutch-speaking version of the PSI-VS would facilitate the assessment of PSC across French- and Dutch-speaking Belgian adolescents.

The main objective of this study was to examine the cross-linguistic validity of the Dutch PSI-VS among Flemish adolescents. Specifically, we develop a Dutch version of the original PSI-VS and examine its factor validity and reliability among Flemish adolescents. Second, we examine the factor validity and reliability of a modified version of the PSI-VS comprising a positively worded reformulation of the reverse-keyed physical attractiveness item. Third, we examine the measurement invariance of the original PSI-VS between Flemish adolescents and French adolescents from Morin and Maïano's (2011a) study. The use of French data from Morin and Maïano (2011a) aims to ascertain that the psychometric properties of the PSI-VS remained unchanged by the linguistic adaptation process. Finally, we examine whether the factor structure of the best PSI-VS version (original or modified) is invariant across sexes, age groups, and body mass index (BMI) categories.

Method

Sample

The Flemish sample comprised 1,115 adolescents (12-19 years; M_{age} = 15.88 years) attending two secondary schools in the Belgian province of Limburg. This sample included: (a) 514 boys and 601 girls; (b) 318 early (aged 12–14) and 797 late adolescents (aged 15–19); and (c) 167 underweight, 846, normal-weight, and 102 overweight-obese youth.

The French sample from Morin and Maïano's (2011a) study included 1,103 French adolescents (11-18 years; M_{age} = 15.45 years). This sample comprised, (a) 429 boys and 674 girls, (b) 343 early (aged 11-14) and 760 late adolescents (aged 15-18); and (c) 124 underweight, 877 normal-weight and 102 overweight-obese youth.

Measures

Demographics. Participants were asked to self-report their sex, age, height, and weight. This information was used to categorize them into BMI (Weight/Height^2) categories based on sex-and age-specific cut-off scores (Cole, Bellizzi, Flegal, & Dietz, 2000; Cole, Flegal, Nicholls, & Jackson, 2007).

PSI-VS. The original PSI-VS was translated into standard Dutch following standardized back-translation techniques (Van de Vrijver & Hambleton, 1996). The Dutch version includes the 12 original items (Table S1 in the online supplement), plus the new positively worded physical attractiveness item, and covers the same six subscales as the original PSI-VS: global self-worth (GSW), physical self-worth (PSW), physical condition (PC), sport competence (SC), physical attractiveness (PA), and physical strength (PS). Items are rated on a 6-point scale ranging from 1 (*Not at all*) to 6 (*Entirely*). Flemish adolescents completed these 13-item (12 original items, plus the modified item), while French adolescents only completed the original 12 items. We refer to the original 12-items as the "original" version, and to the 12-item version in which the negatively worded PA item is replaced by the reformulated item as the "modified" version.

Procedure

This research met the ethical requirements for research with human participants in Belgium and France. Authorization to perform the study was first obtained from the school. Then, appropriate consent procedures were followed to obtain participants written and voluntary agreement prior to data collection. All participants who returned the consent forms answered the questionnaire anonymously. The questionnaires were completed in class under supervision of the teacher.

Analyses

Analyses were conducted using Mplus 7.11's (Muthén & Muthén, 2013) robust maximum likelihood estimator (MLR), and full-information estimation to handle the few missing data (Flemish: 0.09%-0.54%; $M_{missing}$ = 0.26%; French: 0.36%-4.81%; $M_{missing}$ = 1.51%). A confirmatory factor analysis (CFA) was first conducted on the original PSI-VS separately for both samples. Because latent variables are based on two indicators, CFA were locally identified using essentially tau-equivalent constraints (ETEC; Little, Lindenberger, & Nesselroade, 1999). ETEC simply tests whether the two indicators can be considered equivalent in order to improve local identification of the factors. Among the Flemish sample, two additional CFA models were examined with the modified PSI-VS.

The measurement invariance of the original PSI-VS across the Flemish and French samples was then examined in the same sequence used by Morin and Maïano (2011a). The measurement invariance of the best Dutch version (original versus modified) was then examined across sexes, age

groups [early (12–14 years) versus late (15–19 years) adolescents], and BMI categories (underweight, normal weight, overweight-obese).

Model fit was assessed based on multiple indicators (Marsh, Hau, & Grayson, 2005): the chi-square (χ^2) test of exact fit, the comparative fit index (CFI > .90 or >. 95), the Tucker-Lewis index (TLI > .90 or >. 95), and the root mean square error of approximation (RMSEA <. 08 or <. 06). Composite reliability was computed from the CFA parameter estimates, using McDonald's (1970) omega. Measurement invariance was evaluated by examining robust χ^2 difference test ($\Delta R\chi^2$; Satorra, 2000) and changes in CFIs (≤ .01) and RMSEAs (≤. 015) (Chen, 2007; Cheung & Rensvold, 2002).

Results

Factor Validity and Reliability

CFA results are presented in Tables 1 and 2. First, the CFA without ETEC (Models 1-1 and 2-1) of the original PSI-VS showed a satisfactory fit to the data among both samples. Models using ETEC (Models 1-2 and 2-2) resulted in a large decrease in fit in the Flemish, but not French, sample, suggesting that ETEC are appropriate for the French, but not Dutch, data. Modification indices revealed that ETEC should be relaxed for the SC and PA subscales in the Flemish sample. This model of partial ETEC (Model 1-3) provided a satisfactory fit to the data.

The modified PSI-VS also provided satisfactory fit to the data among the Flemish sample without ETEC (Models 1-4), but not with ETEC (Models 1-5). Modification indices revealed that ETEC should be relaxed for the SC subscale. This model (Model 1-6) provided a satisfactory fit to the data, showing that the modified item permits the local identification of the PA factor.

CFA standardized parameter estimates for the original and modified PSI-VS are presented in Table 2. Findings shows that the original French PSI-VS presents substantial and significant (λ = .61-.93) loadings, latent factor correlations (r = .44-.87), and modest to acceptable composite reliability (ω = .64-.90). For the Flemish sample, findings show that 11 items present satisfactory factor loadings (λ = .66-.93), while the original negatively worded item does not (λ = .20). The modified version of this item presents a fully satisfactory factor loading (λ = .76). Additionally, the latent factor correlations appears unaffected across versions (r = .49-.88), suggesting that the replacement of one PA item does not impact factor correlations. Finally, composite reliability coefficients were modest to

acceptable (ω = .67-.89), except for the original PA subscale (ω = .45), but not the modified PA subscale (ω = .72).

Measurement Invariance

Samples. Results from the tests of measurement invariance of the original PSI-VS across samples are reported in Table S2 of the online supplement (Models 3-1 to 3-11). The addition of invariance constraints on the factor loadings (Model 3-2) or intercepts (Model 3-5) resulted in an acceptable ΔRMSEA, but a ΔCFI ≥ .10. Detailed examination of these results suggested that the non-invariance was limited to the reverse-keyed PA item (item PA2). When invariance constraints on the loading (Model 3-3) and intercept (Model 3-6) of this item were relaxed, the results supported the partial invariance of the PSI-VS.

Additionally, invariance constraints on uniquenesses (Model 3-7) revealed an important decrease in fit. Modification indices suggested that the uniquenesses associated with 6 items (GSW2, PSW1, PSW2, PS1, PS2, and PA2) tended to be lower in the Flemish sample. When invariance constraints on these 6 uniquenesses were relaxed, the results (Model 3-8) supported the partial strict invariance of the PSI-VS. The results also suggest that the factor variances-covariances may not be fully invariant across samples (Model 3-9), but that this is mainly due to higher variability on PC, SC, and PA in the French sample (Model 3-10). Finally, findings (Model 3-11) support the invariance of the latent means across samples.

Sex, Age, and BMI. Tests of measurement invariance were conducted on the modified Dutch PSI-VS across sexes (Models 4-1 to 4-7), age groups (Models 5-1 to 5-7), and BMI categories (Models 6-1 to 6-7). Results showed that all fit indices and ΔCFI and ΔRMSEA were adequate at all steps, except for the addition of the partial ETEC (Models 4-3, 5-3, and 6-3), and tests of latent means invariance across sexes (Model 4-7) and BMI categories (Model 6-7). The decrease in fit associated with the ETEC paralleled results for the main model, and did not prove to be dramatic. To ensure local identification of all constructs, these ETEC were thus retained. Regarding latent mean differences, the results showed that boys' latent were significantly ($p \leq .001$) higher on the GSW (.82), PSW (.64), PC (.66), SC (.61), PA (.47), and PS (.86) subscales than girls'. Additionally, results showed that (a) underweight adolescents had lower ($p \leq .05$) latent means on PS (-.48) than normal-

weight adolescents, and (b) overweight-obese adolescents had lower ($p \leq .05$) latent means on GSW (-.67), PSW (-.69), PC (-.93), SC (-.70), PA (1.11), and PS (-.31) than normal-weight adolescents.

Discussion

This study tested the factor validity and reliability of the Dutch PSI-VS among Flemish adolescents. Results supported the factor validity of the PSI-VS and, keeping in mind the limited number of items per factor, showed that the various subscales presented a reasonable level of composite reliability (ω = .67-.89). The modest reliability of the GSW subscale is consistent with recent findings with the GSW subscale from the short version of the PSDQ (Maïano, Morin, & Mascret, 2015; Martin &Whalen, 2013; Papaioannou et al., 2013). In accordance with previous studies (Morin & Maïano, 2011b; Scalas et al., 2013), the reverse-keyed PA item appeared suboptimal and seriously penalized the reliability (ω = .45) of this subscale, while the positively-worded version of this item presented a greatly improved reliability (ω = .72), without affecting latent factor correlations. Furthermore, results revealed that 11 items (excluding the reversed-keyed PA item) from the original PSI-VS presented invariant factor loadings and intercepts across samples, suggesting that the psychometric properties of the PSI-VS were mostly preserved by the cross-linguistic adaptation. Together, these results show that (1) the reverse-keyed original PA item may be problematic; and (2) the modified Dutch PSI-VS provided the best psychometric properties. These findings reinforce previous observations (Aşçı et al., 2009; Lindwall et al., 2011) that negatively-worded items may perform differently among other linguistic or cultural groups.

Furthermore, the measurement and latent mean invariance of the modified Dutch version of the PSI-VS across sex, age groups, and BMI categories were also investigated. Findings provided strong support for the complete invariance of the factor loadings, intercepts and uniquenesses of the modified PSI-VS across these subgroups. These results are consistent with those from previous studies of French and Italian adolescents (Maïano et al., 2008; Morin & Maïano, 2011a; Scalas et al., 2013) and thus supported the cross-linguistic generalizability of the measurement invariance of the PSI-VS. These results also showed that boys and normal-weight adolescents tended to present higher scores on all PSI-VS subscales when compared with girls and overweight-obese adolescents. These mean-level differences are consistent with previous research using the PSI-VS (Maïano et al., 2008;

Morin & Maïano, 2011a; Scalas et al., 2013) and other instruments (Hagger et al., 2005; Marsh, Martin & Jackson, 2010). Similarly, no significant latent mean differences were observed across age groups, which is also consistent with recent findings based on the PSI-VS (Morin & Maïano, 2011a). This lack of latent mean differences might be explained by reference group effects and the restricted age range of participants (all adolescents).

An important limitation is the need to cross-validate the present results with additional and more diverse samples (e.g., youth who do or do not practice sports, youth from other cultures or linguistic backgrounds) of Flemish adolescents. Furthermore, it would be interesting to examine whether the French and Dutch modified PSI-VS are invariant among bilingual Belgian adolescents. Additionally, the test-retest reliability, of the Dutch modified PSI-VS was not examined in this study and should thus be examined in future research, which should also explore the reasons for the lower composite reliability of some subscales. Finally, a complete test of the psychometric properties of the Dutch PSI-VS would require the analysis of its convergent, predictive and discriminant validity.

In conclusion, this research supported the cross-linguistic generalizability of the PSI-VS among French and Flemish adolescents, and shows that researchers and practitioners can confidently rely on the PSI-VS to examine mean-level differences across sex, age groups, and BMI categories. However, future studies of the PSI-VS should devote special attention to the performance of the reverse-keyed PA item. We recommended for future research to rely on a 13-item PSI-VS (12 original items plus the positively-worded reformulation) to systematically assess the performance of this item.

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Table 1

Goodness-of-Fit Statistics of Confirmatory Factor Analyses (CFA) for the PSI-VS

Models	Version	Description	$\chi^2(df)$	CFI	TLI	RMSEA	90% CI	CM	$\Delta R\chi^2(df)$	ΔCFI	ΔTLI	ΔRMSEA
CFA		Flemish sample										
	Original	1-1. CFA without ETEC	146.04(39)**	.981	.968	.050	.041-.058	-	-	-	-	-
		1-2. CFA with ETEC	394.25(45)**	.938	.909	.083	.076-.091	1-1.	265.36(6)**	-.043	-.059	+.033
		1-3. CFA with partial ETEC	185.99(43)**	.975	.961	.055	.047-.063	1-1.	42.10(4)**	-.006	-.007	+.005
	Modified	1-4. CFA without ETEC	139.54(39)**	.983	.971	.048	.040-.057	-	-	-	-	-
		1-5. CFA with ETEC	325.92(45)**	.952	.930	.075	.067-.083	1-4.	207.32(6)**	-.031	-.041	+.027
		1-6. CFA with partial ETEC	226.39(44)**	.969	.953	.061	.053-.069	1-4.	94.19(5)**	-.014	-.018	+.013
	Original	French sample										
		2-1. CFA without ETEC	139.14(39)**	.982	.970	.048	.040-.057	-	-	-	-	-
		2-2. CFA with ETEC	186.72(45)**	.975	.963	.053	.046-.061	2-1.	53.00(6)**	-.007	-.007	+.005
CFA: sex	Modified	4-1. Configural invariance	169.71(78)**	.983	.971	.046	.036-.055	-	-	-	-	-
		4-2. λs invariant without ETEC	182.21(84)**	.982	.971	.046	.037-.055	4-1.	12.50(6)	-.001	.000	.000
		4-3. λs invariant with partial ETEC	271.19(89)**	.966	.949	.061	.052-.069	4-2.	96.24(5)**	-.016	-.022	+.015
		4-4. λs, τs invariant	324.49(95)**	.957	.940	.066	.058-.074	4-3.	59.83(6)**	-.009	-.009	+.005
		4-5. λs, τs, δs invariant	356.40(107)**	.953	.942	.065	.057-.072	4-4.	33.24(12)**	-.004	+.002	-.001
		4-6. λs, τs, δs, ξs/φs invariant	425.15(128)**	.944	.943	.065	.058-.071	4-5.	68.73(21)**	-.009	+.001	.000
		4-7. λs, τs, δs, ξs/φs, ηs invariant	594.97(134)**	.914	.915	.079	.072-.085	4-6.	198.44(6)**	-.030	-.028	+.014
CFA: age categories	Modified	5-1. Configural invariance	177.80(78)**	.983	.971	.048	.039-.057	-	-	-	-	-
		5-2. λs invariant without ETEC	186.21(84)**	.982	.972	.047	.038-.056	5-1.	8.31(6)	-.001	+.001	-.001
		5-3. λs invariant with partial ETEC	271.92(89)**	.968	.953	.061	.053-.069	5-2.	94.33(5)**	-.014	-.019	+.014
		5-4. λs, τs invariant	283.47(95)**	.967	.954	.060	.052-.068	5-3.	10.25(6)	-.001	+.001	-.001
		5-5. λs, τs, δs invariant	296.02(107)**	.967	.959	.056	.049-.064	5-4.	15.90(12)	.000	+.005	-.004
		5-6. λs, τs, δs, ξs/φs invariant	339.51(128)**	.963	.962	.054	.047-.062	5-5.	43.42(21)**	-.004	+.003	-.002
		5-7. λs, τs, δs, ξs/φs, ηs invariant	375.12(134)**	.958	.959	.057	.050-.064	5-6.	39.71(6)**	-.005	-.003	+.003
CFA: BMI categories	Modified	6-1. Configural invariance	213.58(117)**	.984	.973	.047	.037-.057	-	-	-	-	-
		6-2. λs invariant without ETEC	231.42(129)**	.983	.974	.046	.036-.056	6-1.	17.67(12)	-.001	+.001	-.001
		6-3. λs invariant with partial ETEC	306.10(134)**	.971	.958	.059	.050-.067	6-2.	84.05(5)**	-.012	-.016	+.013
		6-4. λs, τs invariant	346.22(146)**	.967	.955	.061	.053-.069	6-3.	41.58(12)**	-.004	-.003	+.002
		6-5. λs, τs, δs invariant	396.91(170)**	.962	.956	.060	.052-.068	6-4.	51.18(24)**	-.005	+.001	-.001
		6-6. λs, τs, δs, ξs/φs invariant	458.99(212)**	.959	.962	.056	.049-.063	6-5.	59.61(42)*	-.003	+.006	-.004
		6-7. λs, τs, δs, ξs/φs, ηs invariant	623.79(224)**	.934	.941	.069	.063-.076	6-6.	165.50(12)**	-.025	-.021	+.013

Note. χ^2 = chi-square; BMI = body mass index; CFI = comparative fit index; CM = comparison model; *df* = degrees of freedom; ETEC = essentially tau-equivalent constraints; PSI-VS = Physical Self-Inventory – Very Short form; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index; 90% CI = 90% confidence interval of the RMSEA; λ = loading; τ = intercept; δ = uniquenesses; ξ = variance; φ = covariance; η = factor means; $\Delta R\chi^2$ = Robust chi-square difference tests; Δ = change from previous model. * $p < .05$. ** $p < .01$

Table 2

Standardized Parameter Estimates from the Confirmatory Factor Analysis Model of the Original and Modified Versions of the PSI-VS

Items	GSW (λ)	PSW (λ)	PC (λ)	SC (λ)	PA (λ)	PS (λ)	δ
GSW 1	.75 (.75) .76						.44 (.44) .42
GSW 2	.66 (.68) .61						.56 (.56) .63
PSW 1		.89 (.89) .86					.21 (.21) .27
PSW 2		.89 (.89).86					.21 (.21) .26
PC 1			.93 (.93) .93				.14 (.14) .14
PC 2			.76 (.76) .88				.43 (.43) .22
SC 1				.67 (.67) .82			.55 (.55) .32
SC 2				.88 (.88) .86			.22 (.22) .26
PA 1					.82 (.75) .78		.32 (.44) .39
PA 2					.20 (.76) .76		.96 (.43) .43
PS 1						.80 (.80) .73	.36 (.36) .47
PS 2						.75 (.75) .70	.44 (.45) .51
ω	.67 (.67) .64	.89 (.89) .85	.83 (.83) .90	.76 (.76) .83	.45 (.72) .74	.75 (.75) .68	

Latent Factor Correlations

Factors	GSW	PSW	PC	SC	PA	PS
GSW	-	(.75)	(.50)	(.61)	(.87)	(.50)
PSW	.75 / .78	-	(.85)	(.88)	(.60)	(.76)
PC	.50 / .44	.85 /.70	-	(.88)	(.50)	(.76)
SC	.61 / .57	.88 / .87	.87 /.68	-	(.57)	(.80)
PA	.87 / .84	.65 /.66	.53 / .47	.61/ .60	-	(.49)
PS	.50 / .64	.76 / .80	.76 / .67	.80 / .86	.52 /.72	-

Note. The results from the French sample are underlined. The parameters from the modified version of the PSI-VS are in parentheses. λ = loading; δ = uniquenesses; ω = McDonald (1970) subscale score reliability coefficient; CFA = confirmatory factor analyses; ETEC = essentially tau-equivalent constraints; GSW = global self-worth; PA = physical attractiveness; PC = physical condition; PS = physical strength; PSW = physical self-worth; SC = sport competence. All loadings and correlations are significant at $p < .001$.

Supplemental Materials for:

Cross-Linguistic Validity of the French and Dutch Versions of the Very Short Form of the Physical Self-Inventory among Adolescents

These online supplements comprise two sections, including:

Table S1
French, Dutch and English Back-Translated Items from the PSI-VS

Items	French Items	Dutch Items	English Items
GSW1	J'ai une bonne opinion de moi-même	Ik heb een goed gedacht van mezelf	I have a good opinion of myself
PSW1	Globalement, je suis satisfait(e) de mes capacités physiques	In het algemeen ben ik trots op wat ik fysiek kan	Globally, I'm proud of what I can do physically
PS1	Je suis physiquement plus fort(e) que les autres	Ik ben fysiek sterker dan de meeste mensen	I'm physically stronger than most people
PSW2	Je suis content(e) de ce que je peux faire physiquement	Ik ben blij met wat ik fysiek kan	I'm happy with what I can do physically
PC1	Je serais bon(ne) dans une épreuve d'endurance	Ik ben goed in oefeningen die fysieke uithouding vragen	I would be good at physical stamina exercises
PA1	J'ai un corps agréable à regarder	Ik heb een mooi lichaam om naar te kijken	I have a nice body to look at
PS2	Je serais bon(ne) dans une épreuve de force	Ik zou goed zijn in oefeningen die kracht vereisen	I would be good at exercises that require strength
PC2	Je pense pouvoir courir longtemps sans être fatigué(e)	Ik denk dat ik lang kan lopen zonder moe te worden	I think I could run for a long time without tiring
SC1	Je me débrouille bien dans tous les sports	Ik kan een oplossing vinden bij problemen in alle sporten	I can find a way out of difficulties in all sports
PA2	Personne ne me trouve beau(belle)*	Niemand vindt dat ik er goed uit zie*	Nobody finds me good-looking*
PA2 reversed	Tout le monde me trouve beau(belle)	Iedereen vindt dat ik er goed uit zie	Everybody thinks that I am good-looking
SC2	Je réussis bien en sport	Ik ben goed in sporten	I do well in sports
GSW2	Je voudrais rester comme je suis	Ik zou willen blijven zoals ik ben	I would like to stay as I am
Answer Scale	1-Pas du tout; 2- Très peu; 3- Un peu; 4- Assez; 5- Beaucoup; 6- Tout à fait	1- Helemaal niet; 2- Zelden; 3- Eerder niet; 4- Eerder wel; 5- Meestal juist; 6- Altijd juist	1- Not at all; 2- Very little 3- Some; 4- Enough 5- A lot; 6- Entirely

Note. *reversed score; GSW = global self-worth; PSW = physical self-worth; PC = physical condition; SC = sport competence; PA = physical attractiveness; PS = physical strength; English items have not been validated yet and are only provide to help readers not familiar with French or Dutch to understand the meaning of each item.

Table S2

Goodness of Fit Indices of the Sample (Flemish vs. French samples) Measurement Invariance Tests Conducted on the Original PSI-VS

Description	$\chi^2(df)$	CFI	TLI	RMSEA	90% CI	CM	$\Delta R\chi^2(df)$	ΔCFI	ΔTLI	ΔRMSEA
3-1. Configural invariance	285.21(78)**	.982	.969	.049	.043-.055	-	-	-	-	-
3-2. λs invariant without ETEC	402.25(84)**	.972	.955	.058	.053-.064	3-1.	131.39(6)**	-.010	-.014	+.009
3-3. λs(PA2) invariant without ETEC	327.38(83)**	.978	.965	.052	.046-.057	3-1.	46.13(5)**	-.004	-.004	+.003
3-4. λs(PA2) invariant with partial ETEC	382.48(87)**	.974	.960	.055	.050-.061	3-3.	61.50(4)**	-.004	-.005	+.003
3-5. λs(PA2), τs invariant	534.79(93)**	.961	.944	.065	.060-.071	3-4.	173.18(6)**	-.013	-.016	+.010
3-6. λs(PA2), τs(PA2) invariant	448.50(92)**	.968	.954	.059	.054-.065	3-4.	72.04(5)**	-.006	-.006	+.004
3-7. λs(PA2), τs(PA2), δs invariant	866.48(104)**	.932	.914	.081	.076-.086	3-6.	384.47(12)**	-.036	-.040	+.022
3-8. λs(PA2), τs(PA2), δs(GSW2, PSW1, PSW2, PA2, PS1, PS2) invariant	506.36(98)**	.964	.951	.061	.056-.067	3-6.	54.96(6)**	-.004	-.003	+.002
3-9. λs(PA2), τs(PA2), δs(GSW2, PSW1, PSW2, PA2, PS1, PS2), ξs/φs invariant	857.33(119)**	.934	.927	.075	.070-.080	3-8.	359.66(21)**	-.030	-.024	+.014
3-10. λs(PA2), τs(PA2), δs(GSW2, PSW1, PSW2, PA2, PS1, PS2), ξs (PC, SC, PA)/φs invariant	614.08(116)**	.956	.949	.062	.057-.067	3-8.	108.13(18)**	-.008	-.002	+.001
3-11. λs, τs(PA2), δs(GSW2, PSW1, PSW2, PA2, PS1, PS2), ξs (PC, SC, PA)/φs, ηs invariant	714.40(122)**	.947	.943	.066	.062-.071	3-10.	109.32(6)**	-.009	-.006	+.004

Note. χ^2 = chi-square; CFI = comparative fit index; CM = comparison model; *df* = degrees of freedom; ETEC = essentially tau-equivalent constraints; GSW = global self-worth; PA = physical attractiveness; PC = physical condition; PS = physical strength; PSI-VS = Physical Self-Inventory – Very Short form; PSW = physical self-worth; RMSEA = root mean square error of approximation; SC = sport competence; TLI = Tucker-Lewis index; 90% CI = 90% confidence interval of the RMSEA; λ = loading; τ = intercept; δ = uniquenesses; ξ = variance; φ = covariance; η = factor means; $\Delta R\chi^2$ = Robust chi-square difference tests; Δ = change from previous model. * $p < .05$. ** $p < .01$.