



# Multidimensional Self-Esteem: Factorial Invariance and Latent Mean Differences across Age and Gender

Michael Peter Wenzler, Katrin Rentzsch, and Astrid Schütz  
 Personality Psychology and Psychological Assessment, University of Bamberg, Germany  
 Contact: michael-peter.wenzler@stud.uni-bamberg.de

## Introduction

Previous research on the structure of self-esteem has partly produced inconsistent findings. Up to date, it is not entirely clear, whether self-esteem becomes increasingly differentiated with age (Byrne, 2002; Marsh, 1990; Shavelson, Hubner, & Stanton, 1976). Existing results suggest that self-esteem becomes more differentiated during preadolescence (Marsh & Ayotte, 2003). However, only little research investigated whether there is further differentiation beyond adolescence.

## Methods

### Approach

Adolescent and adult participants responded to a self-esteem scale. Invariance testing procedures were applied within the framework of confirmatory factor analyses

### Participants

- 661 adolescents (350 female) from 13 to 17 years of age ( $M = 14.2$ ,  $SD = 0.6$ )
- 348 adults (191 female) from 22 to 65 years of age ( $M = 39.5$ ,  $SD = 12.8$ )

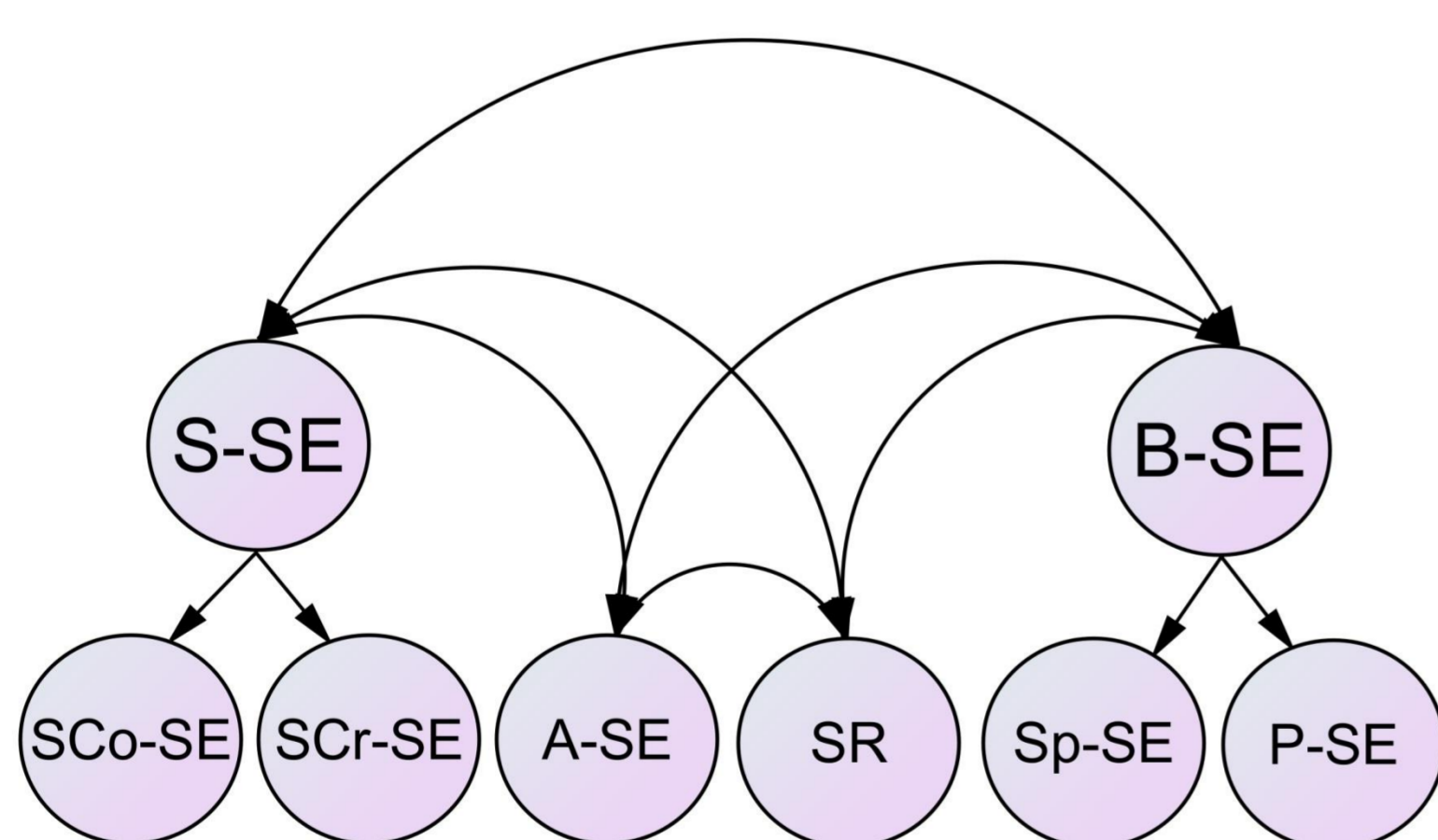
### Measure of self-esteem

- Multidimensional Self-Esteem Scale (MSES; Fleming & Courtney, 1984; German adaptation by Schütz & Sellin, 2006)
- 32 items

## Results

### 1. Structure of Self-esteem:

A multidimensional and hierarchical model revealed the best fit across all relevant groups (adolescents, adults, females, males).



Note: S-SE = Social Self-Esteem, SCr-SE = Social Self-Esteem Concerning Criticism, SCo-SE = Social Self-Esteem Concerning Social Contacts, A-SE = Academic Self-Esteem, SR = Self-Regard, B-SE = Body Self-Esteem, Sp-SE = Self-Esteem Sports, P-SE = Self-Esteem Physical Attractiveness

## Results cont.

### 2. Invariance of self-esteem structure

**Age:** Analyses revealed invariance of structural parameters (i.e. factor loadings, factor covariances and variances, factor residuals) across age.

Model	$\chi^2$	df	$\chi^2/df$	CFI	RMSEA (90% CI)	Model Comparison	$\Delta CFI$
<i>Adolescents vs. Adults</i>							
Model 1 (no constraints)	2,551.277	908	2.810	.885	.042 (.040 – .044)	-	-
Model 2 (equal first order factor loadings)	2,646.175	934	2.833	.880	.042 (.041 – .044)	2 vs. 1	.005
Model 3 (equal second order factor loadings)	2,647.087	936	2.828	.880	.042 (.040 – .044)	3 vs. 1	.005
Model 4 (equal factor covariances/variances)	2,686.580	946	2.840	.878	.043 (.041 – .044)	4 vs. 1	.007
Model 5 (equal factor residuals)	2,731.556	950	2.875	.875	.043 (.041 – .045)	5 vs. 1	.010
Model 6 (equal measurement residuals)	3,184.067	982	3.242	.845	.047 (.045 – .049)	6 vs. 1	.040

Note. CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, 90% CI = 90% Confidence Interval.

**Gender:** Analyses revealed invariance of structural parameters (i.e. factor loadings, factor covariances and variances, factor residuals, measurement residuals) also across gender.

Model	$\chi^2$	df	$\chi^2/df$	CFI	RMSEA (90% CI)	Model Comparison	$\Delta CFI$
<i>Females vs. Males</i>							
Model 1 (no constraints)	2,526.514	908	2.783	.883	.042 (.040 – .044)	-	-
Model 2 (equal first order factor loadings)	2,580.747	934	2.763	.881	.042 (.040 – .044)	2 vs. 1	.002
Model 3 (equal second order factor loadings)	2,588.535	936	2.766	.880	.042 (.040 – .044)	3 vs. 1	.003
Model 4 (equal factor covariances/variances)	2,622.530	946	2.772	.878	.046 (.044 – .048)	4 vs. 1	.005
Model 5 (equal factor residuals)	2,644.694	950	2.784	.877	.043 (.041 – .044)	5 vs. 1	.006
Model 6 (equal measurement residuals)	2,710.606	982	2.760	.875	.043 (.041 – .045)	6 vs. 1	.008

Note. CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, 90% CI = 90% Confidence Interval.

### 3. Latent mean differences

Testing for latent mean differences additionally requires invariance of item and factor intercepts. We found invariance of item and factor intercepts across gender but not across age. As expected, female participants exhibited significantly lower factor means than male participants across the four domains of self-regard, academic self-esteem, social self-esteem, and in particular body self-esteem.

Latent Factors	Estimate	S.E.	C.R.
Self-Regard	-0.262	.046	-5.679***
Academic Self-Esteem	-0.337	.078	-4.320***
Social Self-Esteem	-0.321	.064	-5.048***
Body Self-Esteem	-0.421	.062	-6.775***

Note. Latent means of male participants were fixed to zero and served as a reference value for comparison against latent means of female participants, S.E. = Standard Error, C.R. = Critical Ratio Index.

\*\*\* $p < .001$ .

## Conclusion

- The best model was less hierarchic than originally suggested by several authors (e.g. Shavelson et al., 1976).
- Results show that self-esteem in adults reveals the same differentiation as in adolescents.
- Self-esteem structure was found to be invariant across gender as well.
- Females participants exhibited significant lower levels of self-esteem across the domains of emotional, social, academic and body self-esteem

### References:

- Byrne, B. M. (2002). Validating the measurement and structure of self-concept: Snapshots of past, present, and future research. *American Psychologist*, 57(11), 897–909. doi:10.1037/0003-066X.57.11.897
- Fleming, J. S., & Courtney, B. E. (1984). The dimensionality of self-esteem: II. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, 46(2), 404–421. doi:10.1037/0022-3514.46.2.404
- Marsh, H. W. (1990). A multidimensional, hierarchical model of self-concept: Theoretical and empirical justification. *Educational Psychology Review*, 2(2), 77–172. doi:10.1007/BF01322177
- Marsh, H. W., & Ayotte, V. (2003). Do multiple dimensions of self-concept become more differentiated with age? The differential distinctiveness hypothesis. *Journal of Educational Psychology*, 95(4), 687–706. doi:10.1037/0022-0663.95.4.687
- Schütz, A., & Sellin, I. (2006). MSWS. Multidimensionale Selbstwertkala [MSES. Multidimensional self-esteem scale]. Göttingen: Hogrefe.
- Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, 46(3), 407–441. doi:10.3102/00346543046003407