



## Personality correlates and gender invariance of wording effects in the German version of the Rosenberg Self-Esteem Scale



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### ABSTRACT

The Rosenberg Self-Esteem Scale (RSES) is designed to provide an evaluation of one's self-worth. Investigations on the dimensionality of the RSES do not result in simple unifactorial solutions. The direction of the item wording has been suggested as a reason for the contamination of its factorial structure. Latent factor approaches allow for the modeling of method effects, and, particularly in bifactor models, configurations with substantive as well as additional specific factors can be specified. This paper analyzes data from a longitudinal survey in Germany. A bifactor solution with one substantive and two specific factors related to positive and negative wording performs best out of ten alternative models. Partial scalar invariance of the best-fitting model for gender is supported. Despite a non-significant gender difference in observed self-esteem mean scores, latent mean comparisons reveal a small advantage in favor of males, consistent with the literature, as well as a difference in one of the specific factors. When personality variables are used as predictors of the latent factors, emotional stability is a significant predictor of self-esteem and of both specific factors.

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### 1. Introduction

Rosenberg's Self-Esteem Scale (RSES; Rosenberg, 1965) is one of the most widely used instruments in psychological research (Marsh, Scalas, & Nagengast, 2010). Self-reported responses on 5 positively-worded and 5 negatively-worded items provide a score for a global appraisal of self-worth. Although conceptualized as a unidimensional construct, numerous factor analytic studies have failed to support a one-factor structure. Tafarodi and Swann (1995) suggested a self-competence and a self-liking dimension of global self-esteem. Others referred to a positive and a negative self-concept (Carmines & Zeller, 1979; Huang & Dong, 2012) or a positive and a negative self-evaluation (Roth, Decker, Herzberg, & Brähler, 2008) which comprise the positive and the negative statements of the RSES respectively; however, the two dimensions could not be meaningfully differentiated.

With the development of latent variable modeling techniques, researchers have been able to specify additional effects beyond the substantive *self-esteem* factor, to build better fitting models. Specific *method*

factors that load on similarly worded items (latent method factor [LMF] or bifactor models) and correlated errors among items phrased in the same direction (correlated uniquenesses [CU] models) have been proposed for improved model fit (e.g. Horan, DiStefano, & Motl, 2003; Marsh, 1996; Tomás & Oliver, 1999).

Recent confirmatory factor analyses with an increasing number of alternative models concur that a substantive factor of self-esteem and two method (or specific) factors are needed to achieve successful model fit (e.g. Marsh et al., 2010; Quilty, Oakman, & Risko, 2006). This finding has been replicated with samples of UK high-school students (McKay, Boduszek, & Harvey, 2014), Hungarian adolescents (Urbán, Szigeti, Kökönyei, & Demetrovics, 2014), older adults (Lindwall et al., 2012), and adult samples in the US, Italy, Poland, and Serbia (Alessandri, Vecchione, Eisenberg, & Laguna, 2015), in France (Gana et al., 2013), in Spain (Tomás & Oliver, 1999), in Cyprus (Michaelides, Koutsogiorgi, & Panayiotou, 2016), and in China (Wu, 2008). Method effects can be meaningfully interpreted as response styles (cf. Bentler, Jackson, & Messick, 1971) and not ephemeral methodological artifacts. Types of evidence in favor of this interpretation are the separability of the method from substantive factors and the behavioral consistency across groups. Method effects were also found to be longitudinally stable (Gana et al., 2013; Horan et al., 2003; Marsh et al., 2010).

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The current study compares multiple alternative model specifications for the German version of the RSES. The *first hypothesis* states that the bifactor model with a substantive self-esteem and two uncorrelated method factors linked to either positively- or negatively-worded items will have a superior fit to competing models (a) without method effects, or (b) with alternative specifications of method effects: models with CU, with a single LMF, or with random intercepts. Two previous studies with German samples had not included method factors in their analysis. Roth et al. (2008) supported a substantive second-order factor model with two highly correlated first-order factors of positive and negative self-esteem. Collani and Herzberg (2003) found similar results for a self-acceptance and a self-deprecation factor, but divided the former into two sub-facets of non-specific and specific positive qualities attributed to the self.

### 1.1. Gender differences in method effects

Multiple studies have investigated gender differences in self-esteem. A small but consistent difference in self-esteem in favor of males has been summarized in a meta-analysis of 216 effect sizes by Kling, Hyde, Showers, and Buswell (1999); the RSES or a modified version of it had been used in more than half of the studies included. As summarized by Kling et al. (1999) gender roles, stereotypical socialization in peer interactions, differential treatment in school settings, cultural stereotypes regarding physical appearance in relation to body dissatisfaction, and violence against females are potential explanations for this difference.

Group means may differ due to differences on the construct, but if method effects are present, differences may arise due to response tendencies as well. In two studies with bifactor models, no gender differences were found on a single negative LMF (DiStefano & Motl, 2009b) or on the two LMF (Lindwall et al., 2012); latent self-esteem mean scores were higher for males than females in both studies.

Group differences rest on the assumption that the construct as measured by a scale has the same meaning for the various groups, therefore measurement invariance across groups needs to be examined prior to any comparisons. The *second hypothesis* states that the best fitting model will be invariant between males and females, and that there will be a difference in self-esteem latent mean scores in favor of males and no differences on method factors.

### 1.2. Relationship between method effects and personality variables

The response style interpretation of method effects is further supported by consistencies in their relationship with personality constructs. Quilty et al. (2006), DiStefano and Motl (2006), and Michaelides et al. (2016) have discussed the possibility that an approach-avoidance framework in relation to the behavioral inhibition/activation systems (BIS/BAS) is a useful explanatory theoretical framework for method effects. Method effects were found to correlate systematically to measures of avoidance motivation, anxiety and inhibitory behavior. It is plausible that individuals who are more self-conscious, attentive, and self-critical of their behavior are more aware of, and more likely to endorse negative statements about themselves, and thus are less influenced by method effect due to negatively worded items. Negative correlations were found between negative wording factors and BIS scores (Quilty et al., 2006), self-consciousness, and fear of negative evaluation (DiStefano & Motl, 2006, 2009a), trait anxiety (Tomás, Oliver, Galiana, Sancho, & Lila, 2013), social anxiety, experiential avoidance and private self-consciousness (Michaelides et al., 2016) and depression (Alessandri et al., 2015; Lindwall et al., 2012; Urbán et al., 2014). Fewer associations have been reported with positive wording RSES factors: positive correlations with experiential avoidance and private self-consciousness and negative correlation with social anxiety (Michaelides et al., 2016).

The big five personality dimensions (Costa & McCrae, 1992) have also been used as potential predictors in the same context. Emotional

stability, extraversion, conscientiousness, agreeableness and openness are positively correlated with self-esteem (Aluja, Rolland, Garcia, & Rossier, 2007; Quilty et al., 2006; Ziegler-Hill et al., 2015) with emotional stability having the strongest and openness the weakest relationship. Using data from 53 nations Schmitt & Alick (2005) found stronger correlations of self-esteem with neuroticism (inverse relationship) and extraversion.

As far as associations of the big five dimensions with RSES method factors, Quilty et al. (2006) have reported a positive correlation of the negative method effect with emotional stability, which is not unexpected considering its negative relationship with avoidant and inhibitory behavior, and neuroticism. They have also reported a weak association of negative wording effect with conscientiousness. Following from the relationship of response styles with the cluster of inhibitory and neurotic characteristics, emotional stability is hypothesized to be the most predictive of method effects, among the big five personality dimensions (*hypothesis 3*).

### 1.3. Aims and hypotheses of the study

The current study aims to evaluate the presence of method effects on the RSES by comparing alternative theoretical models with and without method effects, and by varying how method effects are modeled. Ten factor structures suggested in previous studies are evaluated for the first time with German data with a bifactor specification expected to fit better than the alternative models. Second, the invariance of the best fitting model across gender groups is examined and latent factor means of males and females are compared. Invariance is expected to hold and males will score on average higher than females on self-esteem. Finally, among the big five personality dimensions emotional stability is expected to significantly predict method effects.

## 2. Method

### 2.1. Participants

The present study is based on data from The Saxony Longitudinal Study, a prospective observational cohort study launched in 1987 with a total of 1407 14 year-old pupils from 41 schools. This sample was representative of the 1973 birth cohort in the German Democratic Republic (Förster, 2007). Following the 1989 annual wave, 587 participants (52% females) agreed to participate in further investigations. After the German reunification, the study could be pursued with almost annually conducted surveys of socio-political and psychosocial concepts (Berth, Brähler, Zenger, & Stöbel-Richter, 2012). The results reported herein derive from panel waves 25 and 26 in 2011 and 2012 (participants aged 38 and 39 respectively). Only participants who took part in both waves were included in the analyses ( $N = 346$ , 58.9% of the original longitudinal sample that gave informed consent in 1989). Sample demographic characteristics appear on Supplementary Material 1.

### 2.2. Measures

Besides socio-demographic variables, the following questionnaires were administered by mail:

*Rosenberg Self-Esteem Scale*: The 10-item German version of the RSES (Ferring & Filipp, 1996) was administered in 2012. This adaptation was validated on a large representative German sample by Roth et al. (2008). Half of the items are stated negatively, and were reverse-scored, such that higher scores represent high self-esteem. Responses were given on a balanced 6-point Likert scale. Omega reliability was .94.

*Big Five Inventory – short version (BFI-10)*: A 10-item short version of the German BFI (Rammstedt & John, 2007) was administered in 2011. Each trait was measured by two items, one of which was reverse-scored and responses were given on a 5-point Likert scale. The five brief scales had moderate or unacceptable omega reliability coefficients:

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