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## Cross-National Comparability of the Rosenberg Self-Esteem Scale

Shayna A. Rusticus, Anita M. Hubley, & Bruno D. Zumbo  
University of British Columbia  
Vancouver, BC, Canada

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*Correspondence: Shayna Rusticus, Dept. of ECPS, 2125 Main Mall, University of British Columbia, Vancouver, BC, Canada, V6T 1Z4; E-mail: shayna@interchange.ubc.ca*

### Abstract

A growing interest in the measurement of constructs in international settings and the comparison of people in different countries and cultures on these measures has led to greater sensitivity to issues of conceptual equivalence and differences in cultural norms. Such issues are relevant not only when languages and cultures appear to be very different, but also when individuals from different countries share the same language. The Rosenberg Self-Esteem (RSE) scale was chosen as the measure of interest in the present study because it is one of the most widely used measures of self-esteem worldwide. A total of 543 American, 1443 Canadian, and 300 New Zealand university students completed the RSE. Results indicated that the factor structure of the RSE was essentially unidimensional for each country. All items showed factor loadings greater than .40 in each country. Item-level analyses only revealed the presence of significant differential item functioning (DIF) for one item. Overall, these findings suggest that the RSE can be used to to make comparisons of self-esteem across American, Canadian and New Zealand students.

### Introduction

The Rosenberg Self-Esteem (RSE) Scale is one of the most widely used measures of self-esteem worldwide so it is surprising that relatively little research has explored cross-national differences on this measure. To date, only two studies appear to have compared English versions of the RSE across different countries (Feather, 1998; Lennon, Rudd, Sloan, & Kim, 1999). Feather (1998) found that American students had significantly higher self-esteem scores when compared to Canadian and Australian students. Lennon and colleagues (1999) found that Caucasian American female students had significantly higher scores on the RSE than Korean and Singaporean female students, and African American students had significantly higher self-esteem scores when compared to all three other groups.

These findings from previous research must be interpreted with caution because there has been no psychometric evidence to support the cross-national generalizability of the RSE. Heine, Lehman, Markus, and Kitayama (1991) have argued that self-concept research has been largely based on a North American perspective and one cannot assume that our ideas about self-concept will generalize to other social and cultural settings. Whether an instrument is cross-nationally invariant is a key concern when extending theories and their associated constructs to other countries (Hui & Triandis, 1985). Assuming that a measure is functioning equally for all groups without supporting empirical evidence

jeopardises the credibility of results because it does not allow the results to be unambiguously interpreted. That is, any differences found between groups could also be interpreted as indicating that different things were measured.

### **Present Study**

The present study will examine the psychometric comparability of the English version of the RSE based on the analysis of data collected in three countries (U.S., Canada, New Zealand) as part of Michalos' (1991) *Global Report on Student Well-Being*. Specifically, psychometric comparability will be examined by comparing (a) factor structure, (b) internal consistencies, and (c) differential item functioning (DIF) on the RSE by country. Mean RSE performance will also be examined for each country. Following the methodological recommendations of Zumbo (2003) as well as the International Test Commission (ITC) guidelines for test adaptation (Hambleton, 1994), both scale-level and item-level results will be examined.

### **Method**

#### ***Participants***

- 543 American students (192 male, 381 female)
  - mean age of 22.3 ( $SD = 8.36$ )
- 1443 Canadian students (569 male, 874 female)
  - mean age of 22.3 ( $SD = 6.62$ )
- 300 New Zealand students (108 male, 192 female)
  - mean age of 21.9 ( $SD = 6.43$ )

#### ***Procedure***

The data for this study are a subset from a large international study of student well-being (Michalos, 1991). The subset of participants used in this analysis had also completed the RSE. Participants from the original study were obtained using convenience sampling from large introductory undergraduate classes. Questionnaires were completed during class time.

#### ***Measure***

Rosenberg's Self-Esteem (RSE) scale (Rosenberg, 1965) is a 10-item self-report measure of global self-esteem. Items are rated from *strongly disagree* (1) to *strongly agree* (4). Scores range from 10 to 40, with higher scores indicating higher self-esteem. Five of the items are worded positively and five are worded negatively

### **Results**

1. Is the same number of factors identified in each country, and by the same observed variables?

A multi-group exploratory factor analysis of the polychoric correlation matrix was conducted for each country using PRELIS (as per Zumbo, Sireci, & Hambleton, 2003). Because the RSE was designed to use a total score, one factor was extracted for each country. Results indicated an essentially unidimensional factor structure for each country (see Table 1). All items loaded on one factor with the loadings equal to or above .60, with the exceptions of item 8 for the U.S., and item 4 for New Zealand, which both showed factor loadings of .41. The somewhat lower factor loadings for these two items indicate that, while both of these items still load on the factor, they are not as strong an indicator of the

construct as are the other items and do not discriminate as well among low and high scorers on the RSE in these countries. For each country, the ratio of first to second eigenvalues was greater than 3.5. Thus, the same number of factors was identified in each country.

## 2. Are the factor loadings for each country equivalent or proportional to one another?

A Spearman correlation was conducted to assess the consistency of factor loading rankings across countries. These ranking are presented in Table 2. Results indicated a significant correlation between Canada and New Zealand ( $r_s = .745, p = .013$ ), and non-significant correlations between the U.S and both Canada ( $r_s = .127, p = .726$ ) and New Zealand ( $r_s = .612, p = .060$ ).

## 3. Are the internal consistency reliability estimates similar across countries?

Coefficient alpha was used as a measure of internal consistency. Results indicated that the alphas for each country were acceptable and highly similar: U.S.: alpha = .87; Canada: alpha = .86; New Zealand: alpha = .83.

## 4. Are there differences in self-esteem across countries?

Mean performance on the RSE is shown in Table 3. A univariate analysis of variance (ANOVA) was conducted to assess differences in self-esteem across countries. Results indicated a significant main effect for country,  $F(2, 2280) = 16.54, p < .001, \eta^2 = .014$ . However, as the effect size for country only accounts for 1.4% of the overall variance in RSE scores, this suggests that this effect is very small.

## 5. Do the items function equivalently in each country?

Ordinal logistic regression was used to examine each item for the presence of significant DIF. Results indicated that item 8 (“*I wish I could have more respect for myself*”) showed moderate DIF, model-fitting Chi-sq. = 151.67,  $df = 4, p < .001$ , and Nagelkerke R-Sq. = .052 (see Figure 1). For comparison, Figure 2 provides an example of an item that does not display DIF. To determine which of the three countries displayed significant DIF in item 8, separate DIF analyses, using a Bonferonni correction, were conducted for each pair of countries. Results indicated the presence of moderate DIF between the U.S. and Canada, model-fitting Chi-sq. = 145.00,  $df = 2, p < .001$ , and Nagelkerke R-Sq. = .057, as well as between the U.S. and New Zealand, model-fitting Chi-sq. = 36.915,  $df = 2, p < .001$ , and Nagelkerke R-Sq. = .040. There was no significant DIF between Canada and New Zealand, model-fitting Chi-sq. = 4.011,  $df = 2, p = .135$ , and Nagelkerke R-Sq. = .001. Follow-up analyses revealed that, at low total RSE scores, the U.S. students were less likely to strongly agree with the statement “*I wish I could have more respect for myself*”, and at high total RSE scores they were less likely to strongly disagree with this statement, compared to the Canadian and New Zealand students.

## Discussion

The present study examined the psychometric comparability of the English version of the RSE in American, Canadian, and New Zealand university students. Factor analytic results showed that the RSE was essentially unidimensional with each sample. Moreover, all ten items loaded above .40 on the one factor for each sample, although the rank ordering of item loadings was not the same. Nonetheless, these results suggest that the RSE, at the scale level, is measuring a single construct in similar ways among the American, Canadian, and New Zealand students. Satisfactory internal

consistency estimates also support the use of the RSE for each sample. Similar mean performance on the RSE was found among the three student samples.

At the item level, all RSE items functioned equivalently across the countries, with the exception of item 8 which showed moderate DIF. Follow-up analysis indicated that this item functioned similarly for the Canadian and New Zealand students, but differently for the U.S. students. Future research is needed to replicate this finding and consider possible sources (i.e., item impact or item bias) for such a difference.

The findings of the present study may be of interest to researchers using the RSE to examine self-esteem across nations or cultures. Because this study appears to be the first to examine the psychometric comparability of the RSE across different English-speaking countries, future research is recommended to further examine its cross-national and cross-cultural generalizability.

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Table 1  
*Factor Loadings for U.S., Canada, and New Zealand*

Item	U.S.	Canada	New Zealand
1P	.78	.66	.64
2P	.74	.62	.59
3N	.82	.73	.79
4P	.70	.64	.41
5N	.73	.67	.60
6P	.85	.83	.78
7P	.64	.76	.67
8N	.41	.68	.61
9N	.78	.62	.63
10N	.76	.70	.69

Table 2

*Factor Loading Rankings in Descending Order Using U.S. as the Comparison Group*

Item	U.S.	Canada	New Zealand
6P	1	1	2
3N	2	3	1
9N	3	10	6
1P	4	7	5
10N	5	4	3
2P	6	9	9
5N	7	6	8
4P	8	8	10
7P	9	2	4
8N	10	5	7

Table 3

*Means and standard deviations on the RSE by country*

Scores	
U.S.	31.9 (4.97)
Canada	31.0 (4.82)
New Zealand	29.9 (4.52)

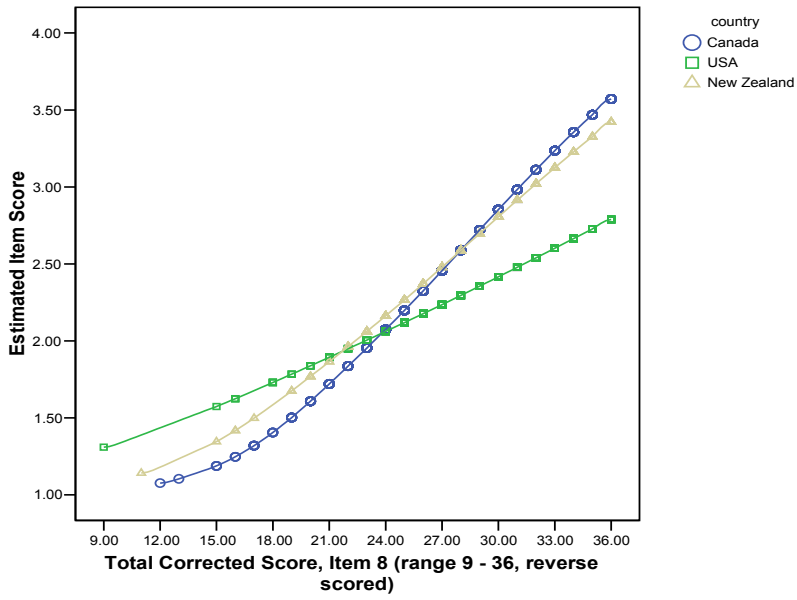


Figure 1. Item displaying significant DIF: Item 8 - “I wish I could have more respect for myself”

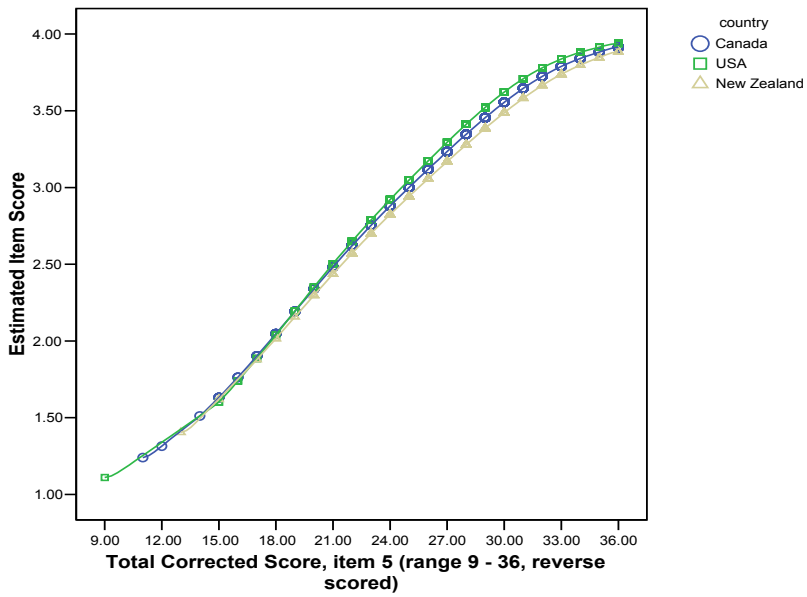


Figure 2. Item displaying no DIF: Item 5 - “I feel that I do not have much to be proud of”