ASSESSING THE ROSENBERG SELF-ESTEEM SCALE DIMENSIONALITY AND ITEMS FUNCTIONING IN RELATION TO SELF-EFFICACY AND ATTACHMENT STYLES

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The purpose of this research was the definition of the dimensionality of the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) among Italian adults. The RSES external relations with self-efficacy and attachment styles were also examined. An important goal was moreover the analysis of the functioning of RSES items when related to self-efficacy and attachment style. A latent trait approach was chosen for the analysis (Many-Facet Rasch Model — MFRM; Linacre, 1989). Participants were 435 Italian university students. The results showed the existence of a main self-esteem dimension. The RSES was significantly related to the external variables. The analysis of the functioning of the items was quite instructive to understand the specificity of each single item construct. It appears that both the content of the item and, in particular, its negative or positive wording affect participants' responses.

INTRODUCTION

The term *self-esteem* indicates a person's evaluation of his or her own overall sense of worthiness (e.g., Baumeister, 1993; Rosenberg, 1979; Schmitt & Allik, 2005). It comprises beliefs such as considering oneself competent or incompetent, and emotions such as feeling happy or desperate, proud or ashamed. Behaviors, like being assertive or shy, confident or cautious, may be affected by self-esteem as well. Self-esteem is usually regarded as an enduring personality trait, even if evaluations of oneself may vary. Although the definition of self-esteem has achieved general consensus, investigators continue to debate its conceptualization and measurement. Among the many instruments for the assessment of self-esteem, the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) remains the most popular and widely applied measure, also because its simplicity has encouraged its translation into many languages (e.g., Schmitt & Allik, 2005). As for the dimensionality of the instrument, Rosenberg argued that self-concept is a combination of hierarchically organized and interrelated parts, therefore a global assessment of self-concept is appropriate. While most psychometric studies have confirmed the one-dimensionality of the Rosenberg scale (e.g., Fleming & Courtney, 1984; Mimura & Griffiths, 2007), a number of research based on factor analysis has suggested that the scale reflects a two-dimensional construct: a *positive* self-image (items 1, 2, 4, 6, 7) and a *negative* self-image (items 3, 5, 8, 9, 10). Such studies supported a model in which the five positively worded items load onto one factor and the five negatively worded items load onto a second factor. Some researchers

interpreted the two factors as two different and distinct images of the self due to different life experiences (e.g., Sheasby, Barlow, Cullen, & Wright, 2000), whereas others suggested that the two dimensions might derive from an artifact of item wording, that is a tendency of the respondent to react symmetrically to positive and negative verbal expressions (e.g., Greenberger, Chen, Dimitrieva, & Farraggia, 2003; Quilty, Oakman, & Risko, 2006). Besides the positive/negative image model, other two-dimensional models are found in the literature. Among others, Tafarodi and Milne's (2002) results showed the existence of two facets of self-esteem, denominated *self-competence* (items 3, 4, 5, 7, 9) and *self-liking* (items 1, 2, 6, 8, 10). Among the studies across different cultures that have supported the two-factor solution, a recent research with Italian participants demonstrated that the Rosenberg self-esteem construct is mainly represented by seven items: 1, 2, 5, 6, 8, 9, and 10, while a second factor of lesser importance comprises items 3, 4, and 7 (Giannini, Di Fabio, & Gori, 2007).

The central goal of the present research consisted in a Rasch analysis of the dimensionality and of the functioning of the RSES items among Italian participants. Using a Rasch model approach allowed a very refined study of the items. In this perspective, Gray-Little, Williams, and Hancock (1997) arrived at the conclusion that, in spite of a single factor model, the 10 items are not equally discriminating and are differentially related to self-esteem. More recently, Roth, Decker, Herzberg, and Bralher (2008), besides confirming the one-dimensionality of the Rosenberg scale, by using Rasch analyses, conducted a very analytic study in order to define the psychometric properties and the response probabilities of the items in a German population sample. Further studies of the functioning of the RSES items are recommended in the literature, which should also take into consideration the external validity of the scale items (e.g., Roth et al., 2008; Schmitt & Allik, 2005). It is in this perspective that in the present study the analysis of the functioning of the Rosenberg scale in relation to two external constructs – self-efficacy and attachment styles – was planned. Roth et al. (2008) argued about a global relation of self-esteem with self-efficacy, due in particular to items 3, 4, 5, 7, 9, which represent self-competence evaluation constructs closely related to Bandura's (1977) concept of general self-efficacy (Tafarodi & Milne, 2002). In this study, two aspects of self-efficacy were analyzed: empathic self-efficacy and social self-efficacy (Caprara, 2001). Further hypotheses were formulated as regards attachment styles. In this context, Blysma, Cozzarelli, and Sumer (1997), Huntsinger and Luecken (2004) expected people with secure and dismissive attachment styles to have higher global self-esteem. Schmitt and Allik (2005) observed that attachment styles should have associations with global self-esteem as measured by the Rosenberg scale.

By applying the Many-Facet Rasch Model (MFRM; Linacre, 1989) the purposes of the current study are many-fold: a) to verify the dimensionality of the RSES with Italian respondents; a hypothesis was proposed that all, or the majority of, the items would show satisfactory fits to the model proving the one-dimensionality of the self-esteem construct; b) to define the positions of the items on the self-esteem dimension; c) to define the locations on the dimension of the gender attribute; no specific hypothesis was made for gender, although some researchers demonstrated no effect of gender on self-esteem (e.g., Roth et al., 2008); d) to analyze the locations on the self-esteem dimension of *external variables* such as self-efficacy and attachment style levels; e) to analyze the functioning of each item in relation to self-efficacy and attachment style levels; hypotheses were put forward of significant interactions between items and levels of the external variables, showing different functioning of the items. In particular, a positive relation

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was expected between self-esteem and both self-efficacy measures – empathic and social – whereas relations between self-esteem and attachment might show both positive and negative interactions depending on the different styles. A hypothesis was also made on the negative and positive wording of the items, which might affect responses; f) to compute a probability value for each item and for each grade of the rating scale. Such analysis allowed to appreciate the positions of the items on the dimension from a probabilistic point of view.

Being aware of the problems involved in the definition of unidimensionality, as pointed out by Smith (2002), a second approach, different from the Rasch analysis, was planned. In this perspective, a Principal Component Analysis (PCA) of the Rosenberg items was elaborated on the basis of the hypothesis that a single principal factor should explain the largest portion of variance. Further, a Cronbach alpha coefficient was also calculated in order to investigate the internal consistency of the single dimension.

METHOD

Participants

The participants were 435 Italian university students, 55% females and 45% males. The following attributes were taken into consideration: age (mean 22.84, standard error 3.63) and experiences of past and/or present romantic relationships, classified into none (25%) and at least one (75%).

Measures

The Rosenberg Self-Esteem Scale. The RSES is a well-known questionnaire introduced in 1965 by Rosenberg, consisting of five positively and five negatively worded items. In the Italian adaptation (Prezza, Trombaccia, & Armento, 1997) administered in this study, the rating scale was a 4-point Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), and its internal consistency, analyzed by means of the Cronbach coefficient, was .84. For the analyses, the five negative items were reversed.

The Self-Efficacy Scales. Two self-efficacy questionnaires constructed and validated with Italian population samples (Caprara, 2001) were administered in the present research: a perceived *Empathic Self-Efficacy Scale* (ESES) and a perceived *Social Self-Efficacy Scale* (SSES). They contained 12 and 15 items, respectively. In both scales, the items were rated on a 5-point Likert scale, from 1 (*I am absolutely capable*) to 5 (*I am not at all capable*). Fundamentally, the two scales were based on the self-efficacy theory by Bandura (Bandura, 1986; 1997; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). More specifically, the ESES assesses the perception of one's capacity to understand other people's thoughts, feelings, and needs, and the ability to take their perspectives whatever these might be. "I consider myself able to recognize a request of comfort and affective support even when such request is not expressed" is a representative item of the ESES. The SSES refers in particular to Smith and Betz's (2000) perceived social efficacy interpretation. These authors examined social self-efficacy factors such as considering oneself

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capable of making friends, pursuing romantic relationships, being socially assertive, or performing in public situations. "I consider myself able to collaborate in any situation, at school, work, or on any project, even when people are not familiar to me" is a sample item of the SSES. The two scales Cronbach's coefficients were .87 and .90, respectively. The items of both scales were all positively oriented.

The Adult Attachment Questionnaire. The Adult Attachment Questionnaire (AAQ) is an Italian adaptation (Colosso, Barbon, & Cusinato, 2006; Salvo, Cusinato, & Rossetti, 1996) of the Relationship Questionnaire by Bartholomew and Horowitz (1991). On the basis of factor analyses and of Rash latent trait analyses, the structure of the AAQ consists of four scales, of 14 items each, denominated, according to the four attachment constructs defined in Bartholomew's attachment theory, as: *Secure, Preoccupied, Dismissive,* and *Fearful.* In this study the items were rated on a 4-point Likert scale, from 1 (*strongly disagree*) to 4 (*strongly agree*). An example of a construct typical of the Secure style is "I always feel comfortable with myself and others." Other examples typical of the Preoccupied, Dismissive, and Fearful styles, respectively, are: "I often find that others are reluctant to get as close as I would like," "Other people's judgments leave me indifferent," "I am uncomfortable getting close to others." The four scales presented a satisfactory internal consistency on the basis of a latent trait analysis and of the Cronbach coefficient analysis (the alpha coefficients were .75, .83, .84, and .83, respectively). All the items were oriented positively for the analyses.

The Model

The MFRM (Linacre, 1989) is an extension of the Rasch simple logistic model (RSLM; Rasch, 1960/1980). It is represented by the equation below (Linacre, 1989), with the elements taken into consideration in this study being: the person's self-esteem (facet 1, β_n), the affectivity of self-esteem item (facet 2, δ_i), gender (facet 3, τ_a), empathic self-efficacy (facet 4, ϖ_b), social self-efficacy (facet 5, λ_c), attachment styles: secure, preoccupied, dismissive, fearful (facets 6, 7, 8, 9, in the equation, η_d, ν_e, ϑ_f, γ_g, respectively). In the equation, φ_k is the measure corresponding to the calibration of the step up to category *k* of the rating scale. In the current study, all facets were oriented positively, except for the items, that is, higher scores corresponded to higher facet measures. All facets were constrained to zero, except for the person facet.

$$P\left(X_{niabcdefgk}\right) = \frac{e^{\left[\beta_n - \delta_i - \tau_a - \varpi_b - \lambda_c - \eta_d - \nu_e - \vartheta_f - \gamma_g - \varphi_k\right]}}{1 + e^{\left[\beta_n - \delta_i - \tau_a - \varpi_b - \lambda_c - \eta_d - \nu_e - \vartheta_f - \gamma_g - \varphi_k\right]}}.$$

With regard to fit evaluation of the parameters, as is known, the fit statistics must determine how well any set of empirical data meets the requirements of the model. In this study both the *mean square outfit* statistic and the *mean square infit* statistic were considered, because of their particularly elaborated quantitative and qualitative features if compared with other fit statistics based on residuals (Linacre, 2005). The outfit statistic places more emphasis on unexpected responses far from a person measure or an item measure, whereas the infit statistic highlights the unexpected responses near the person measure or the item measure (Wright & Masters, 1982). More precisely, the outfit information is simply based on the sum of squared standardized residuals for each person on each item. The sum is then divided by the number of items for each person and by the number of persons for each item, hence *mean square*. The infit is an information-

weighted sum. As is known, the statistical information in a Rasch observation is its variance, which is the squared standard deviation of the estimate. The variance is larger for observations close to an item or a person and smaller for extreme observations. To obtain an infit measure, each squared standardized residual, say for one person through all items, is weighted by its variance and then summed. By dividing that total by the sum of the variances, a fit statistic is obtained which is influenced by the weighting effect (Bond & Fox, 2001). The outfit and infit statistics have a scale form with an expected value of +1 and a range from 0 to positive infinity. An outfit or infit statistic in the .70-1.30 range indicates a satisfactory fit of the empirical data to the model (Bond & Fox, 2001).

A chi-square statistic was also calculated (the fixed chi-square) in relation to each facet in order to verify its discriminating property (Linacre, 2005).

After estimating the measures, the Many-Facets Program can also check for *biases* in a given model. A bias can be due to any kind of *interaction*, such as differential item functioning, differential person functioning, or differential functioning of any other facet (Linacre, 2005). In this study, after estimating the measures for all facets, the interaction/biases of self-esteem measures with different levels of self-efficacy and attachment styles measures were analyzed in accordance with the main objectives formulated above. In order to apply the MFRM, considering the methodological problems relevant when transforming interval-level data into ordinal-level data (Blanton & Jaccard, 2006), the self-efficacy and the attachment style score distributions were categorized on the basis of two percentiles, P_{33} and P_{66}. In this way, for both the self-efficacy scores and the four attachment style scores, three ordered categories were obtained with category 1 indicating the scores below P_{33} (*Low* level), category 2 indicating the scores between P_{33} and P_{66} (*Middle* level), and category 3 corresponding to the scores above P_{66} (*High* level). In doing so, three categories for each external variable were compared in order to investigate the possible effects of the external variables on the self-esteem measures. The *Low* and the *High* categories were considered particularly important in the interpretation in order to discriminate self-esteem responses.

RESULTS

The Identification of the Rosenberg Self-Esteem Scale Dimensionality

In order to define the RSES dimensionality, the item location measures (δ_i) were taken into consideration. The MFRM analysis revealed that nine out of the ten RSES items presented a good fit, that is both infit and outfit statistics were within the limits (.70-1.30). The negative item 5 "I feel I do not have much to be proud of" showed an unsatisfactory fit to the model. To make sure that the new nine-item RSES dimension was internally valid, a second Rasch analysis was performed. The result evidenced a satisfactory fit of the items as shown in Table 1. Such items had a mean value of .00 and standard deviation .09; moreover, they presented a fixed chi-square of 978.4, with eight degrees of freedom and error probability $p < .0001$, indicating that the items had a satisfactory capacity of representing different aspects of the self-esteem construct. Item 5 was dropped in the following analysis.

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TABLE 1
The nine-item RSES version. Measures, standard errors, infit and outfit statistics

	Items	Measure	SE	Infit statistic	Outfit statistic
1.	I feel that I am a person of worth, at least on an equal plane with others	−.03	.09	1.30	1.30
2.	I feel like a person who has a number of good qualities	−.67	.09	.78	.83
3.	All in all, I am inclined to feel that I am a failure (R)	−1.68	.10	1.00	.74
4.	I am able to do things as well as most other people	−.29	.09	.98	.98
5.	I take a positive attitude towards myself	.40	.08	.70	.70
6.	On the whole, I am satisfied with myself	.09	.08	.70	.71
7.	I wish that I could have more respect for myself (R)	1.84	.08	1.30	1.30
8.	I certainly feel useless at times (R)	.65	.08	1.08	1.11
9.	At times I think I am no good at all (R)	−.30	.09	1.24	1.22

Note. Items 3, 7, 8, 9 are reversed for the analysis. SE = Standard Error. (R) = item reversed for the analyses.

In Table 1, items 1, 2, 3, 4, and 9 present negative measures indicating a tendency of the respondents to endorse such self-esteem constructs more frequently; according to Tafarodi and Milne's (2002) interpretation, items 1, 2, and 9 represent a self-liking attitude, whereas items 3 and 4 describe a self-competence perception. In the same table, items 5, 6, 7, and 8 (items 6, 7, 8, and 9 in the original RSES version) show positive measures, that is, the self-esteem constructs of these items are less frequently endorsed. According to Tafarodi and Milne, items 5 and 7 represent self-liking, whereas items 6 and 8 represent self-competence. Items 3, 7, 8, and 9, being negatively worded in the questionnaire, were reversed for the analyses.

As anticipated, the nine items internal consistency was also investigated by means of the Cronbach alpha coefficient. The coefficient value was .85, demonstrating the internal solidity of the dimension.

As already mentioned, in order to further analyze the Rosenberg items to determine their dimensionality, a PCA was performed. The results showed that one factor explained 48% of the total variance and included six out of the nine items with loadings between .64 and .80.

The Model Facets

The person facet. The data showed a mean of 1.70 and a standard error of .65 for the person measures (β_n). The mean square infit and outfit statistics were satisfactory, being 1.03 and .99, respectively. The range for person measures was −5.00-7.32 and the corresponding range for standard errors was 1.86-1.89. The average positive mean value showed that people's responses tended in general toward a positive self-esteem as illustrated in Figure 1.

The gender facet. As regards gender, the results showed a significant difference between males and females ($\chi^2 = 11.0$, $df = 1$, $p < .0001$). The measures on the self-esteem dimension

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were .10 (standard error .05, infit 1.14, outfit 1.12) for males and –.10 (standard error .04, infit .95, outfit .92) for females, with males in general showing a higher level of self-esteem than females (see Figure 1).

The self-efficacy facets. For both the empathic and the social self-efficacy facets, a significant difference between the three levels, *Low*, *Middle*, and *High*, was observed ($\chi^2 = 78.10$, *df* = 2, *p* < .0001 for empathic self-efficacy, and $\chi^2 = 38.70$, *df* = 2, *p* < .0001 for social self-efficacy). The self-esteem measures at the three empathic self-efficacy levels were, respectively, .36 (standard error .05, infit .93, outfit .92), –.14 (standard error .05, infit 1.02, outfit .98), and –.22 (standard error .06, infit 1.13, outfit 1.10); the measures for social self-efficacy were –.25 (standard error .05, infit .92, outfit 1.07), .08 (standard error .05, infit .98, outfit .94), and .17 (standard error .06, infit 1.21, outfit 1.14). These results indicate that self-esteem and self-efficacy, when empathy is considered, have an opposite orientation, namely: a person evaluates him/herself positively though admitting his/her inability to understand other people. Instead, when social self-efficacy is considered, the findings demonstrate that there is a common orientation of self-esteem and of self-efficacy: a person with high self-esteem seems to perceive him/herself as more capable of being socially assertive than a person with lower self-esteem. The position of the self-efficacy measures are illustrated in Figure 1.

The attachment style facets. All four attachment styles facets were characterized by significant differences between the three levels, *Low*, *Middle*, *High* ($\chi^2 = 61.20$, *df* = 2, *p* < .0001 for Secure, $\chi^2 = 267.50$, *df* = 2, *p* < .0001 for Preoccupied, $\chi^2 = 115.00$, *df* = 2, *p* < .0001 for Dismissive, $\chi^2 = 355.40$, *df* = 2, *p* < .0001 for Fearful). The self-esteem measures at the three levels of the *Secure* style were, respectively, .08 (standard error .04, infit 1.01, outfit 1.00), –.32 (standard error .05, infit .98, outfit .92), and .24 (standard error .06, infit 1.08, outfit 1.07). These findings showed that self-esteem and feeling secure have the same orientation, in particular when considering the *Low* vs. *High* level. The low level of a secure attachment style corresponds to the lowest self-esteem measure, and the high level of a secure attachment style corresponds to the highest self-esteem measure. The measures of self-esteem concerning the *Preoccupied* style levels were, respectively, –.08 (standard error .05, infit 1.11, outfit 1.05), –.52 (standard error .05, infit 1.06, outfit 1.02), and .60 (standard error .05, infit .91, outfit .90). In this case as well, a common orientation of self-esteem and of perceiving oneself as preoccupied, considering in particular the two extreme levels – *Low* vs. *High* – was noticed. To give an example: a person who finds that other people are often reluctant to get as close as he/she would like might as well show high self-esteem. The self-esteem measures related to the *Dismissive* style levels were, respectively, .40 (standard error .05, infit .97, outfit .95), –.07 (standard error .05, infit .95, outfit .92), and –.33 (standard error .05, infit 1.14, outfit 1.12). Self-esteem and perceiving oneself as dismissive are opposite, namely, the highest measure of self-esteem corresponds to the low level of the dismissive attachment style and vice versa: a person with a low level of self-esteem prefers not to depend on others or have others depend on him/her. Finally, the measures of self-esteem concerning the *Fearful* style were .04 (standard error .05, infit 1.06, outfit 1.03), –.66 (standard error .05, infit 1.06, outfit 1.01), and .62 (standard error .05, infit .94, outfit .94). Self-esteem and perceiving oneself as fearful, considering the *Low* vs. *High* level, have a common direction. This finding indicates that a person who feels uncomfortable getting close to others might at the same time have high self-esteem. In Figure 1 the locations of the attachment measures are presented.

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|Measr|+person  |+gender   |+ESES   |+SSES       |+SAS    |+PAS    |+DAS    |+FAS    |-item          |Scale|
+  6 + ****.    +          +        +            +        +        +        +        +               + (4) +
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|     | .       |          |        |            |        |        |        |        |               |     |
+  5 + .        +          +        +            +        +        +        +        +               +     +
|     | *.      |          |        |            |        |        |        |        |               |     |
|     | *.      |          |        |            |        |        |        |        |               |     |
+  4 + ***      +          +        +            +        +        +        +        +               +     +
|     | *.      |          |        |            |        |        |        |        |               |     |
|     | **      |          |        |            |        |        |        |        |               |     |
|     | ****    |          |        |            |        |        |        |        |               |     |
+  3 + ****     +          +        +            +        +        +        +        +               +     +
|     | ***     |          |        |            |        |        |        |        |           --- |     |
|     | ******. |          |        |            |        |        |        |        |               |     |
|     | ********|          |        |            |        |        |        |        |               |     |
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|     | *****   |          |        |            |        |        |        |        |               |     |
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|     | *******|           |        |            |        |        |        |        | item 5        |     |
|     | *****   |          |        |            |        |        |        |        |               |     |
|     | *****.  |          | Low    | Low        | High   | High   | Low    | High   |               |     |
|  *  0 + *****. + female male * Middle * Middle High * Low * Low * Middle * Low * item 1 item 6 * +  *
|     | *****   |          | High   |            | Middle |        | High   |        | item 9 item 4 | --- |
|     | **      |          |        |            |        | Middle |        | Middle | item 2        |     |
|     | ***     |          |        |            |        |        |        |        |               |     |
|     | *.      |          |        |            |        |        |        |        |               |     |
+ -1 + *.       +          +        +            +        +        +        +        +               + 2 +
|     | *.      |          |        |            |        |        |        |        | item 3        |     |
+ -2 + .        +          +        +            +        +        +        +        +               +     +
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|     | .       |          |        |            |        |        |        |        |               |     |
+ -3 + .        +          +        +            +        +        +        +        +               + (1) +
|Measr| * = 3   |+gender   |+ESES   |+SSES       |+SAS    |+PAS    |+DAS    |+FAS    |-item          |Scale|
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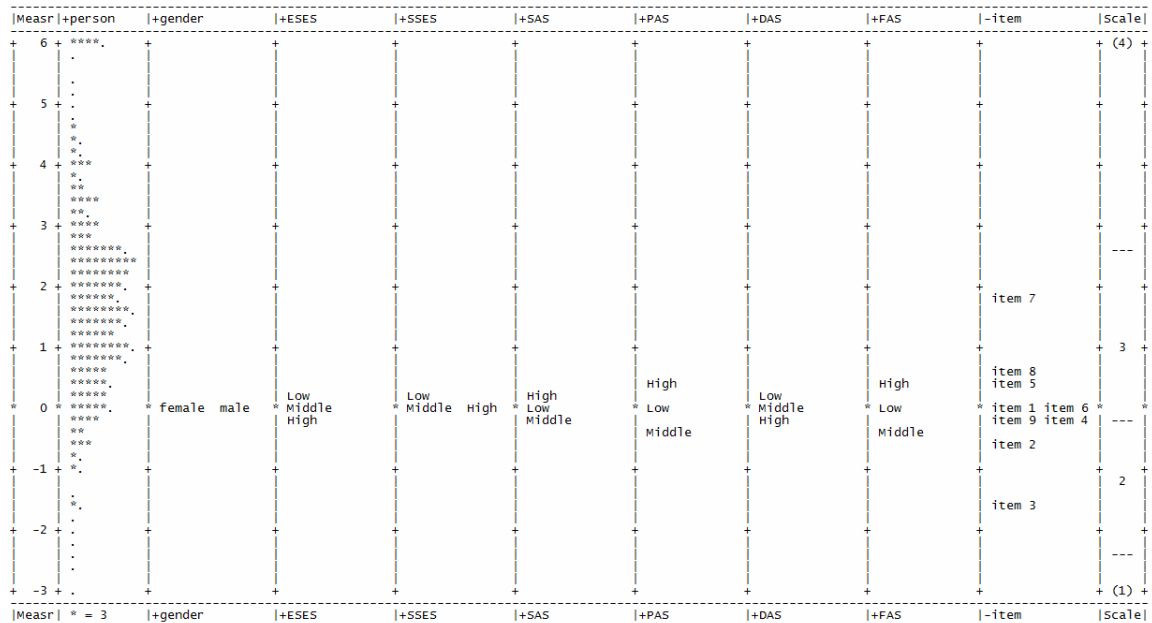
Note. ESES = Empathic Self-Efficacy Scale; SSES = Social Self-Efficacy Scale; SAS = Secure Attachment Style; PAS = Preoccupied Attachment Style; DAS = Dismissive Attachment Style; FAS = Fearful Attachment Style.

FIGURE 1
A summary map of all facets.

As expected, Figure 1 shows that the person measures tend in large part toward the positive values of the examined dimension and the item measures tend toward the negative ones.

The Rosenberg Self-Esteem Scale Item Functioning

As anticipated, after estimating the measures for the facets of the model, the interactions of self-esteem item measures with different levels of both empathic and social self-efficacy and attachment styles measures were analyzed. In order to emphasize the functioning of the items at the extremes of their distributions, the contrasts between the *Low* and *High* levels were taken into particular consideration. Although, as demonstrated above, in general different levels of the external variables discriminate different levels of self-esteem, we hypothesized that not all RSES items behave the same way.

In Figure 2, a summary map of the interactions of self-esteem items with self-efficacy and attachment styles is presented. Seven out of the nine RSES items were involved in the interactions, with four being negatively worded. The interactions analyzed were a total of 18 for each item. Items 1, 3, and 9 showed both qualitatively and quantitatively similar significant interactions with the external variables (56%, 61%, and 56%, respectively), but the negatively worded items 3 and 9 presented positively signed interactions, whereas the positively worded item 1 displayed negatively signed interactions; in other words, negatively and positively worded items showed opposite tendencies. In particular, items 3 and 9 were negatively related to social self-efficacy and also to a secure attachment style, and positively related to the other attachment

styles. On the contrary, item 1 was positively related to both self-efficacy variables and the secure attachment style and negatively related to the other attachment styles. These findings seem to support the hypothesis that the wording of the RSES items affect the participants' responses to some extent (e.g., Greenberger et al., 2003; Quilty et al., 2006). Items 2, 4, 7, and 8 presented fewer significant interactions with the external variables, being in the 17-22% range. Considering the wording of these items and the signs of their interactions, the tendencies noted above were confirmed.

Item	Self-efficacy Empathic			Social			Attachment styles Secure			Preoccupied			Dismissive			Fearful		
Level	LM	LH	MH	LM	LH	MH	LM	LH	MH	LM	LH	MH	LM	LH	MH	LM	LH	MH
1	+				+	+		+			−	−		−	−	−	−	
2								+			−	−					−	
3(R)					−	−	−	−		+	+	+		+	+	+	+	
4								+			−	−					−	
5																		
6																		
7(R)		+					+											−
8(R)											+						+	+
9(R)					−		−	−			+	+		+	+		+	+

Note. (R) = Negatively worded item reversed for the analyses; LM = *Low* level vs. *Middle* level; LH = *Low* level vs. *High* level; MH = *Middle* level vs. *High* level.

FIGURE 2
Summary map of positive (+) and negative (−) interactions of self-esteem items
with self-efficacy and attachment styles levels.

In Table 2, the self-esteem measures involved in the interactions with the external variables are presented. In order to highlight, in particular, the contrasts between self-esteem responses at the extremes of the distribution, only the *Low* vs. *High* levels of the external variables were reported in the tables.

In Table 2, the results on the interactions of the two self-efficacy variables with the self-esteem items demonstrated that items 1, 3, 7 are involved in such interactions, that is, three out of nine RSES items reveal a different functioning. Considering the main contrasts between the *Low* and the *High* levels, item 1 showed a positive interaction with social self-efficacy, item 3 displayed a negative interaction with the same external variable, and item 7 interacted positively

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with empathic self-efficacy. In general, when the self-esteem items were analyzed separately in relation to self-efficacy, their functioning was not heavily affected.

TABLE 2
Interactions of self-esteem items with empathic and social self-efficacy and attachment style levels

External variables	Item	Low	High	*t*	*df*	*p*
		Self-esteem measure				
ESES	7	1.66 (.13)	2.90 (.15)	−2.20	252	.0284
SSES	1	−.48 (.14)	.31 (.16)	−3.68	265	.0003
	3	−1.28 (.16)	−2.24 (.18)	3.31	265	.0011
SAS	1	−.32 (.13)	.36 (.17)	−3.19	276	.0016
	2	−.93 (.14)	−.31 (.18)	−2.74	276	.0060
	3	−1.32 (.14)	−2.26 (.29)	2.91	276	.0039
	4	−.49 (.13)	−.02 (.18)	−2.15	276	.0326
	9	.00 (.13)	−.44 (.19)	1.96	276	.0507
PAS	1	.33 (.14)	−.50 (.14)	4.08	294	.0001
	2	−.48 (.16)	−1.01 (.15)	2.47	294	.0142
	3	−2.56 (.27)	−1.19 (.15)	−4.46	294	.0001
	4	−.06 (.15)	−.70 (.14)	3.04	294	.0026
	8	.35 (.14)	.88 (.13)	−2.71	294	.0071
	9	−.43 (.16)	.23 (.13)	−3.12	294	.0020
DAS	1	.09 (.14)	−.32 (.15)	1.98	284	.0485
	3	−2.03 (.19)	−1.08 (.16)	−3.75	284	.0002
	9	−.45 (.15)	.08 (.15)	−2.56	284	.0036
FAS	1	.41 (.15)	−.36 (.15)	3.64	265	.0003
	2	−.33 (16)	−.88 (.15)	2.49	265	.0136
	3	−2.76 (.19)	−1.28 (.16)	−4.48	265	.0001
	4	.01 (.16)	−.45 (.15)	2.11	265	.0362
	8	.25 (.15)	.81 (.14)	−2.70	265	.0073
	9	−.49 (.17)	−.02 (.14)	−2.14	265	.0336

Note. External variables: ESES = Empathic Self-Efficacy Scale; SSES = Social Self-Efficacy Scale; SAS = Secure Attachment Style; PAS = Preoccupied Attachment Style; DAS = Dismissive Attachment Style; FAS = Fearful Attachment Style. Low = low level of the external variable; High = high level of the external variable. The values in brackets are standard errors.

As far as attachment styles are concerned, six out of the nine RSES items were involved in the interactions: items 1, 2, 3, 4, 8, and 9. Items 1, 2, 4 were positively related to perceiving oneself secure, whereas items 3 and 9 were negatively related. As regards the preoccupied style, items 1, 2, 4 showed a negative relation with the attachment style, whereas items 3, 8, 9 presented a positive relation. Considering the dismissive style, item 1 showed a negative relation with such style, whereas items 3 and 9 were positively related to it. The fearful attachment style interacted

with all six items mentioned above. Items 1, 2, 4 showed a negative relation and items 3, 8, and 9 presented a positive interaction with deeming oneself fearful. Analyzing the item functioning results in an external validation perspective, it appears that the two self-efficacy variables presented fewer interactions with the RSES items than the attachment style variables. Particular attention is due to items 5 and 6, which are not involved in any interaction, nor related to either self-efficacy or attachment styles.

Probability

For each RSES item, by applying the MFRM equation formula, a probability value was calculated for each score of the rating scale from 1 to 4. In order to apply the equation, the calibration measures of the steps up to category k of the rating scale (φ_k) were taken into account, namely, –1.97 (up to category 2), –0.46 (up to category 3), and 2.43 (up to category 4). According to Linacre's suggestion (2005), the φ_k measure, estimated across all items, is particularly appropriate in order to compare the positions of the items on the dimension. As known, the φ_k measure is the barrier between category k and category $k - 1$ of the rating scale. In order to obtain a probability value for each item, the mean values of the measures for person, gender, and each external variable were introduced in the equation, whereas for the item and the scale grade, the corresponding specific measures were included. For illustrative purpose, the probabilities of three items were presented: item 3 with the lowest measure of self-esteem (–1.86), item 1 with a self-esteem measure near the mean (–.03), and item 7 with the highest measure (1.84). The probability values associated each item to each grade of the rating scale: for item 3, .99 (up to grade 2), .97 (up to grade 3), and .72 (up to grade 4); for item 1, .97 (up to grade 2), .89 (up to grade 3), and .33 (up to grade 4); for item 7, .86 (up to grade 2), .58 (up to grade 3), and .07 (up to grade 4). As expected and according to the peculiarity of the Rasch model, the results showed that probability in general decreases from item 3 to item 7, namely, item 3 with the lowest measure of self-esteem is endorsed more frequently than the other items representing higher levels. Moreover, considering the grades of the scale, and in particular grade 4 (*strongly agree*), the probability of endorsing it is higher for item 3 than for items 1 and 7. Probability values confirmed the item locations on the self-esteem dimension.

DISCUSSION

The main purpose of the present study was to address the issues of the dimensionality of the RSES (Rosenberg, 1965) and of the functioning of its items in relation to self-efficacy and attachment styles. Such issues pertain to the scale internal structure, with its external relations and item functioning. The method chosen was the MFRM (Linacre, 1989), which, within a latent trait approach, allows to control the measurement errors of the Rosenberg measures (e.g., Gray-Little et al., 1997; Greenberger et al., 2003). Through the MFRM, the following aspects were tackled: the definition of the dimensionality of the RSES; the definition of the location of the items on the self-esteem dimension; the identification of the position on the self-esteem dimension of external variables such as self-efficacy and attachment style levels; the definition of the functioning of each item in relation to the external variables. Two main hypotheses were

formulated: a) a single dimension should exist which characterizes the RSES; b) although self-esteem is significantly related to the external variables, not all the items might interact the same way with such external variables. Moreover, considering each RSES item singularly, the sign of the relation of an item with an external variable might depend on the negative or positive wording of the item. The participants were 435 Italian university students, males and females. The results can be summarized as follows. A main self-esteem dimension exists which comprises nine out of the 10 RSES items; they show a good fit to the new self-esteem dimension as illustrated in Table 1, thus confirming the hypothesis of mono-dimensionality of the scale (e.g., Fleming & Courtney, 1984; Mimura & Griffiths, 2007; Rosenberg, 1965). According to Rosenberg's arguments, the data indicate that the self-esteem concept is a combination of parts ordered on a dimension. As presented in Table 1, the nine items measures are ordered from item 3 (reversed, –1.68) – the most commonly chosen level of self-esteem from the respondents of this study – to item 7 (reversed, 1.84) – the least commonly chosen level of self-esteem. The nine-item self-esteem construct comprises the five positive items of the original scale and four out of five of the original negative items. In order to further verify the existence of a single self-esteem dimension, a PCA was elaborated on the responses to the nine items. The result shows that a Principal Component exists which explains 48% of the total variance. The internal consistency of the nine-item self-esteem dimension was also verified. A Cronbach alpha coefficient of .85 was obtained.

As regards the external variables, the data were collected by means of the Empathic Self-Efficacy Scale and the Social Self-Efficacy Scale by Caprara (2001). Moreover, the Adult Attachment Questionnaire derived by Salvo et al. (1996) from Bartholomew and Horowitz's (1991) scales, was applied. Following Bartholomew and Horowitz's four-category attachment theory, the secure, preoccupied, dismissive, and fearful styles were analyzed. The significantly different positions of the two self-efficacy facets and of the four attachment facets on the self-esteem dimension show that, globally, the self-esteem construct interacts positively with social self-efficacy and with the secure, preoccupied, and fearful attachment styles, whereas it interacts negatively with empathic self-efficacy and the dismissive attachment style. Particular attention should be paid to the common orientation of self-esteem and of attachment styles such as preoccupied and fearful, and the opposite orientation of the dismissive style. Such results do not confirm previous findings which have provided evidence for the negative relation of self-esteem with the preoccupied and fearful styles and for the positive relation between self-esteem and dismissive style. The Italian data might be explained considering the fact that in the absence of satisfying relationships, for instance when feeling preoccupied or being fearful, a person might obtain satisfaction through other means, thus maintaining a high level of self-esteem (e.g., Huntsinger & Luecken, 2004). In the case of this study, participants are university students who commonly build their self-esteem more on school achievements than on personal relationships. The opposite orientation of dismissive style and self-esteem might have the same explanation, being related to the fact of avoiding behaviors correlated with low self-esteem due to unsatisfactory experiences in school. Another finding which seems to be in contrast with previous results is the opposite direction of empathic self-efficacy and self-esteem, whereas self-esteem goes in the same direction of social self-efficacy. In this case as well, an explanation might be found in the specificity of the participants: being university students, they commonly believe that the efficacy of a successful student is mainly based on the ability of dealing with any situation in school and with any project, even with unfamiliar people (social self-efficacy). On the other

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hand, they think that efficacy does not so much derive from recognizing (an even unexpressed) request of comfort and of affective support (empathic self-efficacy).

The inspection of the contents of the items by means of the analysis of their functioning is quite instructive. The interactions analyzed are a total of 18 for each item. Items 1, 3(R), and 9(R) show similar significant interactions with the external variables, but positively (item 1) and negatively worded items (items 3 and 9) show opposite tendencies. In particular, items 3 and 9 are negatively related to both emphatic and social self-efficacy and also to a secure style of attachment, and are positively related to the other attachment styles. On the contrary, item 1 is positively related to both self-efficacy variables and the secure attachment style and negatively related to the other attachment styles. These findings seem to support the hypothesis that the wording of the RSES items affect the participants' responses (e.g., Greenberger et al., 2003). Items 2, 4, 7, and 8 present fewer significant interactions. It is to be pointed out that the wording of the items might, to some extent, also affect the sign of the relations between global self-esteem measures and the external variable levels discussed above. Greenberger at al. (2003) argued that the internal structure of the Rosenberg scale is mono-dimensional, therefore a bi-factorial structure based on positive and negative self-images might be a spurious distinction.

There are some limitations to this study. First, because participants are university students, the results may not generalize to other groups. Secondly, as we have mentioned above, romantic relationship experiences are not analyzed as regards self-esteem, self-efficacy, and attachment style. The decision of not analyzing such variable is due to the fact that a very large majority of the participants declared they had or had had at least one romantic relationship experience. It might be useful to conduct further studies with different groups of participants, also taking into account the participants' present and past experiences – both affective and related to school achievements. In conclusion, this study, besides confirming the existence of a single self-esteem dimension, sheds new light on the specificity of each RSES single item both on its own and when related to variables such as self-efficacy and attachment styles.

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