

## Measuring adult attachment: A construct validation of two self-report instruments

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This study reports the Swedish construct validation of two translated attachment style scales. The factor structure of the attachment construct was investigated via exploratory and confirmatory factor analyses of attachment scores from 515 students of a Swedish university. Results supported the expected two-factor solution, but found a three-factor solution to be a viable alternative. In addition, the attachment scales were compared with the Big Five personality inventory (NEO-PI), using a sample of 87 Swedish students, and found to have expected correlation to this scale.

*Key words:* Adult attachment, RSQ, RQ, factor analysis, construct validation, NEO-PI

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Research on adult attachment and related issues has flourished during the past decade. Research has been conducted in widely separated countries including American samples (e.g., Collins & Read, 1990; Hazan & Shaver, 1987; 1991; Bartholomew & Horowitz, 1991; Mickelson, Kessler & Shaver, 1997), Israeli samples (e.g., Mikulincer, Florian & Weller, 1993; Mikulincer, 1995), an Australian sample (Feeney & Noller, 1992), and a sample from New Zealand (Siegert, Ward & Hudson, 1995). During the latter half of the 1990s, interest in adult attachment theory in Scandinavia seems to have grown strong. Broberg, Ivarsson and Hinde (1996) present a Swedish translation of the Adult Attachment Interview (AAI) (Georg, Kaplan & Main, 1985), an instrument using childhood memories to identify attachment patterns. The present study aims at validating the underlying construct in two self-report adult attachment instruments that focus on romantic behavior as a basis for determining adult attachment patterns. Both of the present instruments are highly suitable for research involving large samples, whereas the AAI, although adequate in clinical settings, seems less suitable for testing large samples.

### ATTACHMENT THEORY AND RESEARCH

Attachment theory (Bowlby, 1969; 1973; 1980) was originally conceived as a general theory of human personality development. It portrays human development as a product of the interplay between nature and nurture, attachment behavior being seen, in the spirit of neo-Darwinism, as a strategy for biological survival. According to Bowlby (1969), the human infant is born with a biologically programmed system allowing one to form close emotional bonds with significant others. Trustworthy and reliable relationships with significant others act as “secure bases” (Ainsworth &

Wittig, 1969) in life, enabling individuals to experience a basic sense of stability and control.

According to attachment theorists (e.g., Ainsworth, 1990; Carnelley, Pietromonaco & Jaffe, 1994; Collins & Read, 1990; 1994; Hazan & Shaver, 1987; Kobak & Hazan, 1991; Main, 1991), experiences from previous attachments to significant others are internalized to shape cognitive structures (working models) that guide individuals’ expectations of and beliefs regarding past, present, and future social interactions. These internal working models are conceived as including self-images, images of others, and images of the self in relation to others. If an individual fails to acquire a basic trust in a significant other or if, for some reason, such trust is not lived up to by the other, some kind of compensatory adaptive strategy is needed to maintain a coherent self-image and an intact identity (Bowlby, 1973).

Mary Ainsworth and her colleagues have shown in numerous studies (e.g., Ainsworth, Bell & Stayton, 1971; Ainsworth, Blehar, Waters & Wall, 1978) that a child, in its early emotional development, either forms a Secure attachment to its parents and thus gains a Secure base or develops either of two alternative strategies to adapt to its lack of security: Avoidant attachment or Anxious Ambivalent attachment. These categories of attachment have been shown to be applicable to adults as well (e.g., Hazan & Shaver, 1987; 1990; Klohnen & Bera, 1998; Mayseless, Danieli & Sharabany, 1996; Mickelson, Kessler & Shaver, 1997; Mikulincer, 1995; Pietromonaco & Feldman Barret, 1997).

Bartholomew and colleagues (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994) in contrast have constructed an alternative four-category model of adult attachment. Bowlby’s conception of internal working models has been systematized by defining individual differences in attachment in terms of the intersection of

two dimensions: a positive model of the self and a positive model of others. Bartholomew splits the avoidant attachment pattern, constructing two prototypes of avoidant attachment behavior: Dismissing and Fearful. A Dismissing avoidant attachment involves a sense of love-worthiness (lovability) combined with a negative disposition toward other people. A Fearful avoidant attachment indicates a sense of unworthiness (unlovability) combined with an expectation of others to be negatively disposed. A Preoccupied attachment, which is coherent with the Anxious Ambivalent style described above, indicates a sense of unworthiness (unlovability) combined with a positive evaluation of others. A Secure attachment indicates a sense of worthiness (lovability) plus an expectation of other people to generally be accepting and responsive. Griffin and Bartholomew (1994) have shown that a two-dimensional structure underlies the four patterns that are hypothesized and that different methods of assessment converge, as one would expect.

Adults who show qualitatively different working models differ on a broad spectrum of social psychological dimensions, including those of social support (e.g., Simpson, 1990; Simpson, Rholes & Nelligan, 1992), relationship functioning and interpersonal experiences (e.g., Brennan & Shaver, 1995; Bartholomew & Horowitz, 1991; Collins & Read, 1990; Hazan & Shaver, 1987; Kirkpatrick & Davis, 1994; Pietromonaco & Feldman Barrett, 1997), ways of coping with distress (e.g., Holmes, 1997; Mikulincer, 1995; Mikulincer, Florian & Weller, 1993; Simpson, Rholes & Nelligan, 1992), identity and personality (Collins & Read, 1990; Mikulincer, 1995; Shaver & Brennan, 1992), depression (Carnelley, Pietromonaco & Jaffe, 1994), domestic violence (Dutton, Saunders, Starzomski & Bartholomew, 1994), substance abuse (Brennan & Shaver, 1995), and religiosity (Kirkpatrick & Shaver, 1990).

Important for this is the relation between attachment prototypes and the Big five personality factors (Costa & McCrae, 1985). Griffin and Bartholomew (1994) presented data on the relation between their attachment scales and the NEO-PI (Costa & McCrae, 1985). It was found that extraversion was related to the dimension Model of Others, and that Neuroticism was related to the dimension Model of Self. There was correlation to other dimensions as well, but those were of lower magnitude (see also Shaver & Brennan, 1992).

## THE STRUCTURE OF INSTRUMENTS MEASURING ADULT ATTACHMENT

Factor analysis of instruments that measure adult attachment has been conducted in a number of studies. Griffin and Bartholomew (1994) cite a large number of studies showing that exploratory factor analysis of attachment items often results in two dimensions related to "closeness" and "anxiety". The same authors (Griffin & Bartholomew,

1994) present a factor analysis of three attachment instruments: a self-measure, a peer measure, and an interview. However, in their study factors were only analyzed as if the two particular aggregated model variables (Model of Self and Model of Others) created either one or two dimensions based on the use of several instruments. Siegert, Ward, and Hudson (1995) conducted a factor analysis of the Relationship Scales Questionnaire (RSQ) (Griffin & Bartholomew, 1994) using a sample from New Zealand. They concluded that two dimensions achieve a better fit than three or four. The results of testing a three dimensional model are unfortunately not presented in any detail.

Sanford (1997), in conducting a confirmatory factor analysis using items derived from Hazan and Shaver's (1987) study, found a two dimensional model (relationship closeness and relationship anxiety) to be the most parsimonious. Becker, Billings, Eveleth, and Gilbert (1997), in carrying out both an explorative and a confirmatory factor analysis of a new adult attachment measure, obtained three dimensions (Secure, Preoccupied, and Fearful). Collins and Read (1990) conducted an exploratory factor analysis, finding that three factors (close, dependent, and anxiety) best explained their data. It is difficult to arrive at firm conclusions on the basis of these studies. There is no consensus as yet regarding which instrument for measuring adult attachment is ideal or how such an instrument should be constructed.

In the present study Swedish translations both of Bartholomew and Horowitz' (1991) Relationship Questionnaire (RQ) and of Griffin and Bartholomew's (1994) Relationship Scales Questionnaire (RSQ) are employed with the aim of cross validation. The study addresses the psychometric properties of the RQ and the RSQ, in particular their construct validity and reliability. We use both exploratory and confirmatory methods to investigate if the two-dimensional factor structure, suggested by the test constructors, is reasonable also in these Swedish versions of the tests. Further, since three dimensional models have previously been suggested as an alternative to the two-factor solutions, we will also test such models. Both orthogonal and oblique models will be tested and analysis will be performed on both aggregated scales and single items.

As a complement to the factor-analytic methods we test if the Swedish versions of the tests correlate with the Big Five dimensions the same way as the English versions.

## METHOD

### *Participants*

A group of 515 undergraduate students at Lund University, 214 male and 301 female, participated in the study voluntarily and without compensation. The average age of the participants was 23.9 years ( $SD = 4.7$ ). An additional 87 undergraduate students at the same university, 33 male and 54 female, were used to compare results from the NEO-PI (Costa & McCrae, 1985) and the Relationship Scales Questionnaire (RSQ) (Griffin & Bartholomew, 1994).

### Material

The Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991) consists of four short paragraphs describing different attachment prototypes that apply to close peer relationships. Participants are asked to rate, on a 7-point scale, how well they match each prototype and are also asked to select the description that best explains their feelings. The Swedish translation of the RQ was carried out by Anders Broberg, Department of Psychology, Gothenburg University, Sweden.

The Relationship Scales Questionnaire (RSQ) (Griffin & Bartholomew, 1994) is an indirect measure of the Bartholomew and Horowitz' (1991) four attachment prototypes. It consists of 30 phrases drawn from the paragraph descriptions of Hazan and Shaver's (1987) attachment measure, Bartholomew and Horowitz' (1991) Relationship Questionnaire (RQ), and Collins and Read's (1990) Adult Attachment Scale. Participants rate (on a 5-point scale) how well each item fits their characteristic style in close relationships. RSQ scores for the four attachment prototypes are obtained by computing the mean of the items representing each prototype. Four of the items contribute to the score for the Preoccupied and the Fearful scales and five of the items to the scores for the Secure and the Dismissing scales. One of the items of the Dismissing scale is included in reversed form in the Preoccupied scale. The thirteen remaining items are not used in the scales. Bjarne M. Holmes of Lund University, Sweden, carried out the Swedish translation of the RSQ.

The NEO-PI was developed by Costa and McCrae (1985) to measure neuroticism, extraversion, openness, conscientiousness, and agreeableness, better known as the Big Five personality traits. The NEO-PI has been used extensively both in personality research (e.g., Costa & McCrae, 1985) and in clinical settings (e.g., Costa, 1991). Hans Bergman of the Magnus Huss Clinic, Stockholm, Sweden, translated the Swedish version of the test from English.

### Procedure

The objective of the study was to validate two attachment scales, RQ and RSQ. One way of doing this was to investigate the factor structure of these scales. As already indicated, there is no consensus on how many factors should be used to describe attachment. Therefore both exploratory and confirmatory methods were employed. The results obtained will be compared with those of other published studies. The confirmatory models were estimated by use of LISREL (Jöreskog & Sörbom, 1996). The STREAMS program (Gustavsson & Stahl, 1997) aided in creating the LISREL models. *Chi-square*, *GFI*, and *RMSEA* were used to estimate the model fit. In addition the reliability of the RSQ scales was measured by Cronbach's alpha.

## RESULTS AND DISCUSSION

### Scales based on attachment prototype

Table 1 shows the means and standard deviations obtained for the RQ and RSQ scales. As can be seen in Table 2 the correlation obtained between the RQ and the RSQ were moderate to high.

Eight variables, four from each of two instruments, were analyzed with Principal Component Analysis (PCA). Initially, two factors were extracted and were rotated using the Varimax method. These two factors explained 64% of the variance in the eight variables. Factor loadings were

Table 1. Means and standard deviations for the RQ and RSQ

	N	Mean	Std. Deviation
RQ Secure	517	4.6035	1.5674
RQ Dismissing	517	3.4023	1.7970
RQ Preoccupied	517	3.0522	1.7727
RQ Fearful	517	3.1025	1.9368
RSQ Secure	517	16.5706	3.0067
RSQ Dismissing	516	14.6589	3.4195
RSQ Preoccupied	516	12.3043	2.6200
RSQ Fearful	517	9.6325	3.1451
Valid N (listwise)	515		

Table 2. Correlation between RQ and RSQ

	RSQ Secure	RSQ Dismissing	RSQ Preoccupied	RSQ Fearful
RQ Secure	0.595	-0.264	-0.074	-0.473
RQ Dismissing	-0.208	0.632	-0.370	0.343
RQ Preoccupied	-0.233	-0.228	0.628	0.034
RQ Fearful	-0.387	0.202	0.081	0.668

found to be comparable across the RQ and RSQ. As can be seen in Table 3, Factor 1 had the highest loadings for the Fearful (positive) and Secure (negative) scales. Factor 2, in turn, had the highest loadings on the Dismissing (positive) and Preoccupied (negative) scales. A moderate positive loading on Factor 1 was also found for the Dismissive scales. These results, with the exception of the loading on Factor 1 of the Dismissive scale, are basically consistent with Griffin & Bartholomew's (1994) results.

As an alternative to a two-factor model, a three-factor model was extracted using the same methods as above. This solution explained 74% of the total variance. The factors were rotated using both orthogonal and oblique (oblimin) methods. The loadings obtained for the oblique model are

Table 3. Factor loadings from a two-factor solution on scales based on prototypes

	Component	
	1	2
RQ Dismissing	0.455	-0.661
RQ Secure	-0.761	
RQ Preoccupied	0.265	0.766
RQ Fearful	0.725	
RSQ Dismissing	0.467	-0.649
RSQ Secure	-0.785	-0.145
RSQ Preoccupied	0.174	0.849
RSQ Fearful	0.810	-0.148

Note. Extraction: Principal Component Analysis. Rotation: Varimax with Kaiser Normalization.

shown in Table 4. The Preoccupied, Dismissing, and Fearful scales loaded positively on one factor each and the Secure scale loaded negatively on all factors. Correlation between the factors were weak to moderate (see Table 5).

The factor structures were also tested with random generated subgroups constructed from the whole groups. These additional tests resulted in approximately the same models. The loadings were never more than 0.1 points away from the analysis of the large group. These results called for a Confirmatory Factor Analysis (CFA) aimed at testing whether a three-factor solution has a significantly better fit than a one- or two-factor solution.

Four models were tested. The covariance matrix was analyzed by the Maximum Likelihood method.

1. The first model used one factor to explain all the manifest variables. Analysis yielded a Chi-square value of 749.1 ( $df = 20$ ;  $p < 0.001$ ), a *GFI* value of 0.71, and a *RMSEA* value of 0.268.
2. The same data was also tested using a two-factor model. Fearful and Secure variables loaded on one factor and Dismissive and Preoccupied on the other. This model improved the overall fit ( $GFI = 0.79$ ), with a reduction in the Chi-square value to 504.7 (the reduction in Chi-square was 244.4 with the same  $df$ ). When the two factors were allowed to correlate the Chi-square value was not reduced (the difference was 0.1).
3. A third test was conducted on the same data using a three-factor solution. The exploratory factor analysis

conducted earlier resulted in a model in which each of the negative attachment styles loaded on one factor and the Secure variables on all the factors. Testing this model indicated an improved overall fit ( $GFI = 0.89$ ), Chi-square being reduced to 292.6 which was a reduction of 212.1 ( $df = 3$ ;  $p < 0.001$ ). When the latent variables were free to correlate the Chi-square value was further reduced to 100.4, a reduction of 192.2 ( $df = 3$ ;  $p < 0.001$ ). The three-factor model with correlation yielded a *RMSEA* value of 0.115 ( $p < 0.05$ ) and a *GFI* of 0.95. Although the *RMSEA* value indicates the fit to not be perfect, the *GFI* value suggests it to be acceptable.

4. To get an even better fit, one more latent variable was created. It was specified to include method variance, meaning that all eight observed variables were defined to load equally on this latent variable. This four factor model reduced the Chi-square value to 54.83, a reduction of 49.17 ( $df = 1$ ;  $p < 0.001$ ). It also gave a *GFI* of 0.97 and a *RMSEA* of 0.079. The observed variables loaded between 0.11 and 0.25 on this latent method variable, with the RQ variables having slightly higher loadings.

Griffin and Bartholomew (1994), reviewing the literature on dimensional approaches to the attachment concept, concluded that a two-dimensional model has attractive properties. However, they did not regard a three-dimensional model as being an option. On the basis of traditional attachment theory, they argued for a two dimensional model in which the factors can be defined as measuring Model of Self and Model of Other or the prototypes Secure vs. Fearful and Dismissing vs. Preoccupied. In an earlier study, Bartholomew and Horowitz (1991) presented a pattern of factor loadings very similar the one presented here. The Fearful and Dismissing scales were closer together in the loading plot, indicating a positive correlation. A recent study by Brennan, Clark and Shaver (1998) found a similar loading pattern for the RSQ.

The present study does not settle the question of how many dimensions are needed to account for attachment patterns. There are a number of differences between the present study and other studies that need to be accounted for, e.g., the items used in the RQ and RSQ being translations and the sample consisting of Swedish students. In addition, from a theoretical point of view, much speaks for a two-factor model (Bowlby, 1973; 1980; Griffin & Bartholomew, 1994; Siegert, Ward & Hudson, 1995). However, the present results do suggest that a three factor model of the dimensional structure of the RQ and RSQ, in which two factors are slightly correlated (Factor 1 and Factor 3; see Table 3), is a viable alternative to a two factor model (see Collins & Read, 1990, who obtained similar results in an explorative study).

It should also be noted that there seems to be variance related to response style in the answers of questionnaires. Subjects have a general tendency to endorse either the upper

Table 4. Factor loadings in a three factor solution for scales based on the attachment prototypes

	Component		
	1	2	3
RQ Dismissing	0.819	-0.293	0.261
RQ Secure	-0.648	-0.402	-0.520
RQ Preoccupied	-0.161	0.835	
RQ Fearful	0.260	0.186	0.920
RSQ Dismissing	0.813	-0.282	0.280
RSQ Secure	-0.571	-0.534	-0.548
RSQ Preoccupied	-0.315	0.839	
RSQ Fearful	0.502	0.127	0.894

Note. Extraction: Principal Component Analysis. Rotation: Oblimin with Kaiser Normalization.

Table 5. Correlation between components in a three factor model based on RSQ and RQ prototypes

Component	1	2	3
1	1.000	-0.079	0.412
2	-0.079	1.000	0.224
3	0.412	0.224	1.000

or lower part of all scales. The loadings on this response factor was rather low compared to the loadings on factors measuring the different attachment styles.

#### Specific items in the RSQ

Do items in the RSQ load on two orthogonal dimensions? To examine this hypothesis further, the 17 items in the RSQ were subjected to an exploratory factor analysis with Varimax rotation, using PCA.

The two first components explained 37, 9% of the variance. Extracted communality was rather low for some items. However, it should be noted that the reliability of single items is often low, which partly account for the low figure for explained variance. Rotation (see Table 6) resulted in a first factor with positive loadings on Fearful and Dismissing and negative loadings on Preoccupied and Secure. The second factor showed high positive loadings on Preoccupied and Fearful and negative loadings on Secure. These factors appear to resemble the hypothesized "model of other" (Factor 1) and "model of self" (Factor 2). Note however, that this analysis did not result in high positive loadings of the Dismissing items on factor 2, which suggests that this factor is problematic. A three factor solution (see Table 7) resulted in a factor (1) with high loading on Fearful items and three of the Secure items, a factor (2) with high loading on Preoccupied items, and a factor (3) with high loadings on Dismissing items and on one of the Secure items. Instead of detailed results of this analysis being

Table 6. Factor loadings of RSQ items, two-factor solution

	Component	
	1	2
RSQ Dismiss 2	0.657	
RSQ Dismiss 26	0.643	0.267
RSQ Preoccupied 8	-0.575	
RSQ Secure 10	-0.572	-0.156
RSQ Dismiss 22	0.504	
RSQ Dismiss 19	0.490	-0.116
RSQ PreDis 6	0.489	
RSQ Fear 24	0.468	0.400
RSQ Secure 15	-0.344	0.103
RSQ Secure 28 rev		0.707
RSQ Preoccupied 16	-0.117	0.697
RSQ Secure 9 rev	-0.310	0.583
RSQ Fear 5	0.307	0.547
RSQ Fear 1	0.525	0.545
RSQ Preoccupied 25	-0.187	0.542
RSQ Fear 12	0.527	0.527
RSQ Secure 3	-0.399	-0.441

Note. Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. Rev = coded reversed. PreDis6 is coded for both Preoccupied (positive) and dismissive (negative). Loadings lower than 0.1 excluded.

Table 7. Factor loadings of RSQ items, three-factor solution

	Component		
	1	2	3
RSQ Fear 1	0.735	0.204	
RSQ Fear 12	0.703	0.217	0.130
RSQ Dismiss 26	0.664		0.305
RSQ Fear 24	0.602	0.121	0.101
RSQ Secure 10	-0.587	0.152	-0.180
RSQ Secure 3	-0.569	-0.181	
RSQ Fear 5	0.534	0.325	
RSQ Dismiss 2	0.518	-0.248	0.483
RSQ Preoccupied 8	-0.512	0.386	-0.143
RSQ PreDis 6	0.389	-0.230	0.309
RSQ Preoccupied 16	0.169	0.737	
RSQ Secure 28 rev	0.227	0.715	
RSQ Secure 9 rev		0.681	-0.227
RSQ Preoccupied 25		0.615	
RSQ Dismiss 22	0.208	-0.102	0.866
RSQ Secure 15			-0.809
RSQ Dismiss 19	0.337	-0.292	0.372

Note. Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Rev = coded reversed. PreDis6 is coded for both Preoccupied (positive) and Dismissive (negative). Loadings lower than 0.1 excluded.

presented, the results of a Confirmatory Factor Analysis (CFA) are shown below in Table 8.

CFAs were conducted to investigate whether a one-factor, two-factor, or three-factor model best explained the covariance of the RSQ items. The models tested were based on attachment theory and on the factor analysis of the aggregated scales presented above. Altogether, six model solutions were tested.

A one-factor model resulted in a Chi-square of 1158.7, a *GFI* of 0.74, and a *RMSEA* of 0.131, all indices showing poor fit. A two-factor model based on the idea that one factor should be related to the Secure and Fearful items and one to the Dismissing and Preoccupied items did not improve the fit. A model based on the "self" and "other" models was then tested.

Two factors, each including all of the items, were created in order to achieve a CFA using the "self" and "other" models. All Fearful and Dismissing items were set to equal in the first factor, which resembled the "other" model. All Fearful and Preoccupied items were set to equal in the second factor, resembling the "self" model. This analysis yielded an improved solution and a *Chi-square* value of 917.0, a *GFI* of 0.82, and a *RMSEA* of 0.116. An oblique model using the same constraints did not yield a better fit.

When three factors were employed (see above), the CFA of the aggregated scales showed the best fit, therefore such models were also tested. Items related to the Dismissive, Fearful, and Preoccupied scales, were defined as loading on one factor each. Items related to the Secure scale were

Table 8. Standardized loadings of the CFA items. Covariation between factors assumed

	Latent factors		
	1	2	3
RSQ Fearful 1		0.77	
RSQ Dismiss 2	0.65		
RSQ Secure 3	0.00	-0.42	-0.05
RSQ Fearful 5		0.56	
RSQ PreDis 6	0.36		-0.08
RSQ Preoccupied 8			0.20
RSQ Secure 9	0.31	-0.21	-0.41
RSQ Secure 10	-0.39	-0.20	-0.41
RSQ Fearful 12		0.74	
RSQ Secure 15	-0.44	0.19	-0.05
RSQ Preoccupied 16			0.78
RSQ Dismiss 19	0.47		
RSQ Dismiss 22	0.47		
RSQ Fearful 24		0.51	
RSQ Preoccupied 25			0.49
RSQ Dismiss 26	0.63		
RSQ Secure 28	0.04	-0.18	-0.63

Note. Estimation method, Maximum Likelihood. PreDis6 is coded for both Preoccupied (positive) and Dismissive (negative).

defined as loading on all the factors. The orthogonal model (see Table 8) resulted in a *Chi-square* of 771.40, a *GFI* of 0.85, and an *RMSEA* of 0.110.

The oblique model, in which there was correlation between the three factors, resulted in a still better solution. A *Chi-square* of 653.4, a difference of 118 ( $df = 3$ ;  $p < 0.001$ ) was obtained, a *GFI* of 0.87, and an *RMSEA* of 0.102. This results in a fit that is far from perfect, but on the other hand, shows a two-factor model to be problematic. Secure items did not have high loadings on all factors, but rather different items were related to separate factors. Thus, there seems to be less than perfect homogeneity on the item level since the items, especially those of the Secure scale, do not load highly on the same factors. This will be further scrutinized in the next section.

It was not possible (due to convergence problems) to fit a model using a latent variable estimating method variance, as was done above with the scales.

#### Reliability of the RSQ

A question of interest is the reliability of the scales in RSQ. The homogeneity of the scales was measured using Cronbach's Alpha. The Secure ( $\alpha = 0.32$ ) and Preoccupied ( $\alpha = 0.46$ ) scales were found to have very low reliability.

Griffin and Bartholomew (1994) reported coefficients in the same range as those just referred to. They argued that the low degree of homogeneity they found was due not to the number of items being small, or to the items being poorly conceived, but rather to the fact that the questions mirror two dimensions at the same time. Coefficients for

Fearful ( $\alpha = 0.79$ ) and Dismissing ( $\alpha = 0.64$ ), on the other hand, are quite impressive in view of the low number of items. This implies that the low reliability of the Secure scale may in fact be due in part to a poor choice of questions. This could be remedied either by selecting a more homogeneous set of items or by increasing the number of items. The factor analysis presented above, involving three factors, indicate the Secure scale items to be related to all three dimensions. This suggests that Griffin and Bartholomew (1994) may be right about the Secure scale being related to more than one dimension, but this does not appear to be the case for the other scales.

As already indicated, the RSQ can be used to measure the variables Model of self and Model of others. The reliability of Model of others was found to be acceptable ( $\alpha = 0.68$ ), but that of Model of self is rather low ( $\alpha = 0.50$ ).

#### Other evidence regarding construct validity

Construct validity can partly be shown by demonstrating that an instrument correlates in a theoretically meaningful way with other valid instruments of accepted validity measuring either the same, related, or different constructs. Griffin and Bartholomew (1994) used NEO-PI (Costa & McCrae, 1985) to show that the RQ and RSQ correlated with personality factors yet were not identical to any of them. They employed the same model variables as in the present study. Griffin and Bartholomew (1994) found a strong negative correlation between Model of self and the Neuroticism factor and a positive correlation between Model of other and the Extraversion factor. Table 9 presents the correlation for the present data between the RSQ models and the NEO-PI factors. The pattern of correlation obtained was almost a copy of that reported by Griffin and Bartholomew (1994). The major differences lie in that the Swedish version contains a somewhat higher correlation between the Other-model and Extraversion and that the weak correlation between Conscientiousness and the Self-model could not be replicated in this study. Despite these minor differences, the pattern of correlation in Table 9 suggests that the Swedish version of the RSQ measures essentially the same construct as the original test.

Table 9. Correlation between RSQ dimensions and NEO-PI

	Model of self	Model of others
Extraversion	0.267*	0.598*
Neuroticism	-0.664**	-0.257*
Openness	0.102	0.272*
Conscientiousness	0.019	0.061
Agreeableness	0.267*	0.489*

\* Correlation sign at the 0.05 level (2-tailed)

\*\* Correlation sign at the 0.01 level (2-tailed)

## GENERAL DISCUSSION

Clearly, the concept of human attachment has had a strong impact on how romantic relationships are understood and defined today (Hazan & Shaver, 1987) and this will probably continue to be the case in the future. Measures of attachment have often concentrated on measuring the prototypes suggested by Bowlby and new versions suggested by Bartholomew and others.

Attention has been directed in the present study at the underlying dimensions that are more or less latent to classification. Several research groups have recognized the existence of such dimensions (e.g., Bartholomew & Horowitz, 1991; Sanford, 1997). Bartholomew and Horowitz (1991) have presented one of the most influential conceptualizations, involving the dimensions of Model of Self and Model of Others (Griffin & Bartholomew, 1994).

Results of the present study indicate that the Swedish translations of the RQ and RSQ have psychometric properties comparable to those of the original versions. Exploratory and confirmatory factor analysis revealed basically the same structure as found in earlier research. For example, the Swedish versions had approximately the same two-dimensional structure as Bartholomew and Horowitz (1991) reported. Fearful and Secure items were shown to load on the one factor and Preoccupied and Dismissing items on the other. The fact that Dismissing items correlates with both factors has been largely overlooked earlier, although it can be found in the studies of Bartholomew and Horowitz (1991) and of Brennan, Clark, and Shaver (1998). In their loading plots the Fearful and Dismissing items are clustered together, in a manner closely similar to what we obtained.

Griffin and Bartholomew (1994), Sanford (1997), and Siegert, Ward, and Hudson (1995) all maintain that two dimensions best explained their attachment data. However, only Siegert, Ward, and Hudson (1995) used specific items from the RSQ in their analysis. Griffin and Bartholomew (1994) employed the aggregated model variables (self and others), whereas Sanford (1997) used a slightly different set of items based solely on Collins and Read's (1990) Adult Attachment Scale. Our data accords more closely with that obtained in the original analyses carried out by Collins and Read (1990) and by Becker, Billings, Eveleth, and Gilbert (1994), indicating that a three dimensional model in which the factors are partly correlated is a viable alternative to a two dimensional model. In a three dimensional structure the items from the Fearful, Preoccupied, and Dismissing scales load on separate factors whereas the Secure scale is complementary to all of these, having negative loadings on all the other factors.

The fit, especially in the analysis of RSQ items was far from perfect. One way to increase the fit in the model is to change the hypothesized loadings between the observed and the latent variables; e.g., some of the secure items could be

changed to load only on one of the latent variables. This kind of change in model is seemingly similar to rotating the loadings in exploratory factor analysis. The question asked in the present study however, was not which latent variables best explains the RSQ items, but rather whether one, two, or three latent variables best explains the RSQ items.

Griffin and Bartholomew (1994) suggested, in presenting the RSQ, that the rather low reliability of some of its scales could be attributed to an attempt at mirroring more than one dimension. The present results suggest that this only apply to the Secure scale. It should be possible to increase the moderate reliability of the remaining scales through allocating more items to each of them.

Griffin and Bartholomew (1994) used the NEO-PI (Costa & McCrae, 1985) to obtain further construct validity data. In their study as well as in the present one Model of self was found to be related to anxiety and Model of other to extraversion. Correlation matrixes from both studies show basically the same pattern, providing support for both the convergent and the discriminatory validity of the test. Various studies have reported on such associations between attachment variables and the Big Five dimensions. Being able to demonstrate comparability of this sort further supports the credibility of the Swedish version of the RSQ.

We conclude that the RQ and the RSQ measure similar constructs. The correlations between the scales of the two tests were rather high and the loadings obtained in the exploratory factor analysis were likewise high. Although the RQ is shorter and can thus be completed more quickly, its reliability has been questioned. It aims mainly at classification into attachment groups. The RSQ seems to be a better alternative for measuring the model variables (self and others) and the basic scales defined for the test. The reliability of the Secure scale can however be questioned, as has been demonstrated above. Our hope is that the results of this study will encourage researchers to use these tests in their own studies and assist them in understanding the tests underlying constructs of these tests.

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