Development and validation of Adult Attachment Inventory

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Abstract

This paper presents an account of the development, reliability, and validity of Adult Attachment Inventory. One thousand four hundred and eighty students from the University of Tehran (860 females, 620 males) were included in this study. All participants were asked to complete Adult Attachment Inventory (AAI), Coopersmith Self-Esteem Inventory (SEI), and Inventory of Interpersonal Problems (IIP-127). Results supported three-factor structure, convergent and discriminant validity, internal consistency, and test-retest reliability of the AAI. It was concluded that the AAI can be considered as a reliable and valid scale to measure the attachment styles including secure, avoidant, and ambivalent in Iranian samples.

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1. Introduction

Bowlby (1969, 1988) described mental representations of attachment. These mental representations (internal working models) are known as attachment styles. Attachment styles are formed early in life and then to be relatively stable (Bowlby, 1988; Fraley, 2002; Simpson, Collins, Tran, & Haydon, 2007). Ainsworth et al (1978) measured individual differences in attachment styles in terms of anxiety, avoidance, and security. Ainsworth's classification of attachment styles influenced the development of many measurement instruments for infants, children, and adults.

Hazan and Shaver (1987) proposed that three attachment styles seen between infants and their primary caregivers would emerge as three primary attachment patterns during adulthood. They developed a self-report questionnaire to classify adult attachments into secure, avoidant, and anxious/ambivalent clusters. These are the ways in which adults think, feel, and behave in romantic relationships. According to Hazan and Shaver's threefold typology, secure are characterized by comfort with caring, intimacy, supportiveness, understanding, and dependence on their partners; avoidants are characterized by fear of intimacy and discomfort with dependence; anxious/ambivalents are characterized by obsession, emotional instability, strong physical attraction, preoccupied with attachment issues, and seeking more closeness and intimacy to their partners.

Various instruments are used to measure attachment patterns. The Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), the Reciprocal and Avoidant Attachment Questionnaire for Adults (West & Sheldon, 1988), the Adult Attachment Scale (Collins & Read, 1990), the Relationship Questionnaire (Bartholomew

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& Horowitz, 1991), the Relationship Style Questionnaire (Griffin & Bartholomew, 1994), and the Attachment History Questionnaire (Crowell, Fraley, & Shaver, 1999) are assessment scales to be used as self-report instruments to measure the attachment styles.

A 21-item Adult Attachment Inventory (AAI) was devised from the above mentioned instruments. The main purpose of the present study was to examine the psychometric properties of the AAI with specific reference to its internal consistency, test-retest reliability, concurrent validity, and factor structure.

2. Method

2.1. Participants and Procedure

One thousand four hundred and eighty students (620 males, $M_{age} = 22.85$ years, age range: 18-29 years, and 860 females, $M_{age} = 21.80$ years, age range: 18-27 years) attending the University of Tehran were randomly selected to participate in this study. All participants were asked to complete Adult Attachment Inventory (AAI; Besharat, 2005), Coopersmith Self-Esteem Inventory (CSEI; Coopersmith, 1967), and Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988) at the same time to assess concurrent, convergent, and discriminant validity of the instrument. Three hundred students completed the AAI twice, with a four-week interval between measurements in order to assess test-retest reliability of the scale. The AAI factor structure was assessed using exploratory factor analysis.

2.2. Measures

**Adult Attachment Inventory (AAI; Besharat, 2005)** - An original pool of 25 items for the AAI was derived from the Attachment Style Questionnaire (Hazan & Shaver, 1987), the Relationship Questionnaire (Bartholomew & Horowitz, 1991), and the Attachment History Questionnaire (Crowell, Fraley, & Shaver, 1999) and validated for the purpose of measuring attachment styles in Iranian population (Besharat, 2005). Items consisted of statements that had previously proved useful in assessing 3 styles of attachment including secure attachment (10 items), avoidant attachment (8 items), and anxious/ambivalent attachment (7 items). After the 25 items were discussed and examined for clarity of expression and ambiguities, a set of 21 items was retained for the subsequent steps of scale development. Participants respond to the items using a five-point Likert-type scale ranging from 1 (very little) to 5 (very much).

**Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1967)** - This is a 58-item self-report instrument designed to measure personal attitudes concerning self-evaluation in four areas including general self-esteem, social self-esteem, family self-esteem, and educational self-esteem. Items are rated as yes or no (0 or 1). A single total score is calculated on the basis of the 58 items. Adequate psychometric properties of the SEI have been reported (Coopersmith, 1990; Fisher & Beer, 1990).

**Inventory of Interpersonal Problems (IIP; Horowitz et al., 1988)** - This is a 127-item self-report instrument designed to measure difficulties that people experience in interpersonal relationships. It consists of six subscales including hard to be assertive, hard to be sociable, hard to be intimate, hard to be submissive, too responsible, and too controlling. Items are rated on a five-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). Adequate psychometric properties of the IIP have been reported (Besharat, 2008, 2009; Horowitz et al., 1988).

3. Results

3.1. Factor Analysis of the AAI

Prior to principal axis factoring, the matrix was assessed for psychometric adequacy using Bartlett's test of sphericity (Bartlett, 1950) and the Kaiser-Meyer-Olkin measure of sampling adequacy (MAS; Kaiser, 1970). Measures of psychometric adequacy suggested that the correlation matrix was suitable for factor analysis: Bartlett's
test of sphericity indicated that items were interdependent ($\chi^2 = 33798.40, \ P < 0.001$); the Kaiser-Meyer-Olkin measure of sampling adequacy was well above the 0.50 minimally accepted level (MSA = 0.78).

To test the construct validity of the AAI, a principal components factor analysis with an orthogonal solution (varimax rotation) using eigenvalue-one procedure was performed on the item responses from the entire sample of 1480 participants. The scree test identified three significant factors. Six items with negative loadings or lower than 0.60 were omitted, thus reducing the scale to 15 items. Only items that loaded positively and above 0.60 in any of the three factors in the pattern matrix were selected, as these loadings represent the unique relationship between the factor and the item. The three-factor solution accounted for 80.57% of the total variance and the scale was reduced to 15 out of 21 items. Table 1 lists the items with large pattern matrix elements.

| Factor 1 | Factor 2 | Factor 3 |
|----------|----------|----------|
| Item | PME | Item | PME | Item | PME |
| 2 | .84 | 6 | .85 | 13 | .81 |
| 4 | .78 | 9 | .81 | 14 | .79 |
| 1 | .75 | 7 | .77 | 15 | .73 |
| 3 | .66 | 10 | .69 | 11 | .64 |
| 5 | .62 | 8 | .63 | 12 | .61 |

Factor 1 = Secure Attachment Style; Factor 2 = Avoidant Attachment Style; Factor 3 = Ambivalent Attachment Style; PME = pattern matrix element

### 3.2. Correlations between the AAI, the SCSE, and the IIP

To examine the relationship between the TMPS, the IIP, the NEOPI-R, and the MHI, a series of zero-order correlations was conducted. Table 2 shows correlations of the TMPS with interpersonal problems, neuroticism, extraversion, psychological well-being, and psychological distress. These correlations support concurrent, convergent and discriminant validity of the TMPS. Internal reliability coefficients and mean inter-item correlations for the TMPS are also presented at the bottom of this table.

| Scale/Variable | Secure | Avoidant | Ambivalent |
|----------------|--------|----------|------------|
| Self-Esteem    |        |          |            |
| General Self-Esteem | .39   | NS       | NS         |
| Educational Self-Esteem | .40   | NS       | NS         |
| Family Self-Esteem   | .41   | NS       | NS         |
| Social Self-Esteem     | .41   | NS       | NS         |
| Interpersonal Problems|       |          |            |
| Assertiveness         | -.44  | NS       | .45        |
| Sociability           | -.43  | NS       | .26        |
| Intimacy              | -.56  | NS       | .28        |
| Submissiveness        | -.44  | .44      | NS         |
| Responsibility        | -.52  | .35      | .30        |
| Controlling           | -.49  | .26      | NS         |
| IIP total score       | -.71  | .36      | .43        |
| Internal Reliability Coefficient | .90  | .87      | .85        |
| Mean Inter-Item Correlation | .27  | .24      | .21        |

SEI = Self-Esteem Inventory; IIP = Inventory of Interpersonal Problems; NS = Not Significant
All p values < .05.
3.3. Reliability

In order to examine the internal consistency for the AAI, Cronbach alpha coefficients were calculated for the entire sample of 1480 participants. The alpha coefficients for the Secure Attachment Style, Avoidant Attachment Style, and Ambivalent Attachment Style were .91, .87, and .90, respectively. These findings suggest that the AAI is internally consistent.

To examine the test-retest reliability of the AAI, 300 students completed the scale four weeks after initial testing. Intraclass correlation coefficients between the scale scores at time 1 and time 2 were calculated. The evidence of the temporal stability was .82 for Secure Attachment Style, .78 for Avoidant Attachment Style, and .75 for Ambivalent Attachment Style.

4. Discussion

The overall results of the present study provided support for factorial validity of the AAI in a sample of Iranian students. The results of the exploratory factor analysis provided support for the three styles of attachment: Secure Attachment Style, Avoidant Attachment Style, and Ambivalent Attachment Style. This is in line with the factor structure found in the previous studies (Bartholomew & Horowitz, 1991; Crowell et al., 1999; Hazan & Shaver, 1987).

The concurrent, convergent, and discriminant validity of the AAI was demonstrated in the pattern of correlations between the AAI factors and measures of related constructs including different aspects of self-esteem and interpersonal problems. Findings confirmed the concurrent, convergent, and discriminant validity of the AAI. The pattern of correlations is consistent with the results from previous studies (Bartholomew & Horowitz, 1991; Crowell et al., 1999; Hazan & Shaver, 1987).

The results indicated that the AAI has adequate internal consistency and test-retest reliability. The homogeneity of the factor scales was confirmed by the mean inter-item correlations, which tended to fall within the optimal range of .20 to .40 (Cole, 1987; Breckler, 1990). The results also revealed that test-retest reliability was satisfactory for the AAI subscales.

The AAI demonstrated a replicable three-factor structure that was congruent with the theoretical construct of attachment behaviors. Future research in the field of attachment can benefit from the AAI. The scale can help in understanding mechanisms in interpersonal and intimate relationships. Iranian findings on attachment styles can also contribute to our knowledge of cultural influences on the construct. These findings, however, are limited in terms of the stability of the factorial structure. Although this study provides evidence about the psychometric properties of the AAI, the task of establishing the reliability and validity foundations of the instrument, as well as its factorial structure is an ongoing process.

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