

Development and Validation of Adult Attachment Scale (AAS)

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Attachment is a well-explored construct since John Bowlby's substantial contributions nearly a half-century ago. Although the attachment research focused on infancy and childhood for many years, there have been recent attempts to broaden the research based on adult relationships. Adult attachment refers to the long-lasting tendency to seek and maintain proximity with preferred individuals to achieve a sense of security. Most self-report scales measuring adult attachment available today focus on romantic attachment, and the subscales do not adequately represent the construct. A new scale is developed here based on Bartholomew's four-category model of attachment. This study aims to develop and validate an Adult Attachment Scale (AAS). The steps followed in the development of the scale are: literature search and item generation, content validity testing or expert evaluation, and validation survey. A preliminary 112-item scale was developed and tested on a sample of 320 adult individuals (Males=151, Females=169) in the age range of 25 to 45 years. An Exploratory Factor Analysis (EFA) yielded a four-factor structure, which jointly accounted for 50.42% of the variance. Confirmatory Factor Analysis (CFA) demonstrated a good fit for the proposed model. The findings provide evidence for high internal consistency of the 51-item scale. Cronbach's alpha of the 5-point Likert scale was 0.86, and that of the subscales Secure, Preoccupied, Fearful, and Dismissing were 0.91, 0.94, 0.85, and 0.89, respectively. The scale was also found to have good construct validity in terms of convergent and discriminant validity. The Adult Attachment Scale was found to be a useful and promising measure with good psychometric properties to identify the dominant attachment style of the adults.

Keywords: adult attachment, scale development, Bartholomew's model of attachment

Adult Attachment: Theoretical Background

Attachment theory is a broad theory in social development (Ravitz et al., 2010); originally proposed by John Bowlby (Bowlby, 1969/1982); a British psychoanalyst, and further elaborated by a large number of other proponents (e.g., Ainsworth et al., 1978; Bartholomew & Horowitz, 1991; Fraley & Shaver, 2000; Hazan & Shaver, 1987). It entails the development and persisting significance of emotional bonds between children and their primary caregivers or 'attachment figures,' who are thought to provide a child with a 'safe haven' in times of danger and a 'secure base' from which to explore the surrounding world.

Although attachment research focused on infancy and childhood for many years, there have been recent attempts to broaden the research based on adult relationships. Adult attachment refers to the long-lasting tendency to seek and maintain proximity with preferred individuals to achieve a sense of security. According to Bowlby, an internal working model, a cognitive framework that governs mental representations of self and others, is established from early experiences with primary caregivers. This serves as the prototype for forming and sustaining later

relationships across the lifespan and accounts for relatively stable individual attachment orientations (Frias et al., 2015).

Patterns of Attachment

Patterns of attachment between infants and their attachment figures were first observed by Ainsworth et al. (1978) from a laboratory experiment setting named Strange Situation Procedure (SSP), designed to observe attachment behaviors exhibited by infants or children and their parents. The identified patterns were secure, anxious, and avoidant, which were elaborated by integrating a fourth pattern 'disorganized' by Main and Solomon (1986, 1990). In 1991, Bartholomew and Horowitz proposed a four-category classification system of attachment based on two underlying dimensions, i.e., self and others. In the course of time, researchers have been developing new measures of these or related dimensions. Two higher-level factors, anxiety and avoidance, were found out from factor analysis of the items from measures up to that time (Brennan et al., 1998).

Bartholomew's Four-category Model of Attachment

The assumption that attachment is a categorical or typological construct, which depicts that individual differences within an attachment category are unimportant or non-existent, has been criticized by many researchers in the field. Recent research demonstrates that attachment is better characterized as a multidimensional construct, and hence, a dimensional assessment of attachment is being supported in practice (Gagliardi, 2022; Morales-Vives et al., 2021). Although there exists no consensus as to whether the attachment is a typological or dimensional construct, Bartholomew and Horowitz (1991) devised a model that reconciles both approaches (Fraley et al., 2015; Morales-Vives et al., 2021).

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This model has its roots in Bowlby's (1969) original theory which suggests two types of internal working models, such as representations of the "self" and "others" (Bartholomew, 1990). There are four categories based on these two axes. The first category includes positive self- and others-representations; the second category includes negative self-representation, but positive others-

representation; the third category comprises negative self- and others-representations; whereas the fourth category encompasses positive self-representation, but negative others-representation. The authors labelled these categories as secure, preoccupied, fearful, and dismissing styles, respectively. This four-category model of attachment is illustrated as Figure 1 below:

Figure 1
Bartholomew's Four-category Model of Attachment

		Model of self (Anxiety)	
		Positive (Low)	Negative (High)
Model of other (Avoidance)	Positive (Low)	CELL I Secure Comfortable with intimacy and autonomy	CELL II Preoccupied Preoccupied with relationships
	Negative (High)	CELL IV Dismissing Dismissing of intimacy-Counter-dependent	CELL III Fearful Fearful of intimacy-Socially avoidant

Note. Adapted from "Attachment Styles among Young Adults: A Test of a Four-Category Model," by Bartholomew and Horowitz (1991). *Journal of Personality and Social Psychology*, 61(2), 226-244 (<https://doi.org/10.1037/0022-3514.61.2.226>). Copyright 1991 by American Psychological Association.

This model depicts secure attachment as the relative absence of attachment anxiety and attachment avoidance. People with secure attachment have a positive self-image and believe they are worthy of affection. Furthermore, they trust others and are at ease in their relationships. Preoccupied attachment implies high attachment anxiety and low attachment avoidance. Those with preoccupied attachments have low self-esteem but a favorable attitude toward others. They desire intimacy with others but don't trust that those individuals will be there and supportive when needed. High attachment anxiety and high attachment avoidance are involved in fearful attachment. These people have low self-esteem and do not trust others. They believe they are unworthy of love and are afraid of rejection. Finally, dismissing attachment is characterized by low attachment anxiety and high attachment avoidance. These people are more at ease in relationships with limited intimacy and do not expect others to support them (Griffin & Bartholomew, 1994; Morales-Vives et al., 2021; Tamaki & Takahashi, 2013).

Assessment of Adult Attachment

The stable patterns of interpersonal interactions in adulthood, referred to as adult attachment styles, are derived from their earlier psychological connectedness between children and caregivers (Tamaki & Takahashi, 2013). A rise in interest has been seen in the past few years in adult attachment research from theoretical and empirical perspectives. Many researches show how adult attachment styles influencing on social and emotional adaptability in adulthood (Fraley et al., 2015). Assessment of attachment was carried out employing a variety of methods like observations, interviews, projective techniques, and self-report measures. As self-report measures are generally inexpensive and require little training to administer and score because of which they are often the chosen method of assessment, it is crucial to have robust instruments with

suitable psychometric qualities to measure adult attachment styles.

Most of the measures of adult attachment conceptualize adult attachment as two orthogonal dimensions (Avoidance & Anxiety) or three dimensions proposed by Ainsworth et al. (1978), i.e., Security, Avoidance, and Anxiety. A few of the existing instruments adopted Bartholomew and Horowitz's four-category model of attachment incorporating four attachment patterns, i.e., Secure, Preoccupied, Fearful, and Dismissing (e.g., RQ; Bartholomew & Horowitz, 1991; RSQ; Griffin & Bartholomew, 1994; ASQ; van Oudenhoven et al., 2003). Also, some instruments use a combination of these two models to assess adult attachment (e.g., ASQ; Feeney et al., 1994).

Need of the Study

While examining the existing measures of adult attachment, it is evident that many of them are limited in their applicability among adults or their relationships due to their overemphasis on the romantic relationship (e.g., ECR; Brennan et al., 1998; RAC; Hazan & Shaver, 1987; ECR-R; Fraley et al., 2000). In some of the instruments, multi-sentence description or prototype pattern of the attachment styles makes it difficult to interpret the degree to which the person characterizes a particular attachment style (e.g., AAS; Collins & Read, 1990; RQ; Bartholomew & Horowitz, 1991). Also, inaccuracy in tapping the security and insecurity dimension was apparent in some of the previous attachment measures (e.g., ASQ; Feeney et al., 1994; ECR; Brennan et al., 1998; ECR-R; Fraley et al., 2000). A few of the previous instruments were marked by their difficulty in determining the most dominant attachment style (AAS; Collins & Read, 1991; ASQ; van Oudenhoven et al., 2003).

In addition, though new scales have been developed to assess adult attachment, the cultural and contextual influences on attachment are less considered in the scale construction process. Based on the empirical findings, there is little doubt that attachment

is largely influenced by culture (Agishtein & Brumbaugh, 2013). India, a country with a collectivist cultural background, stresses preserving strong-tie relationships, prioritizing group over self, and promoting social support, empathy, in-group favoritism and harmony, unlike individualist societies (Strand et al., 2019). Therefore, these peculiarities must be considered while developing a scale for use in the Indian population.

Based on Bartholomew's four-category model, the present study aims at developing a new Adult Attachment Scale (AAS) that harmonizes the typological and dimensional nature of attachment and incorporates items on the collectivist cultural background.

Method

Participants

The participants recruited for the study included a convenient sample of 320 adults between 25 and 45 years in age ($M = 32$; $SD = 5.6$) comprising 169 females and 151 males. Among the participants, 69.1% were married, 28.1% were unmarried, 1.6% were separated, 0.6% were divorced, and 0.6% were widowed. Most of them were from nuclear families (71.3%), 38.8% from rural background and most of the participants (88.1%) were hailing from Thrissur district of Kerala. Majority of them were Hindus (57.2%) and 54.4% belonged to the OBC community. About 44.7% were graduates, and 31.9% were in professional jobs (31.9%).

The samples were randomly split into two groups in order for the issues concerning common method variance to be resolved. Data from the first group of samples was utilized for Exploratory Factor Analysis (EFA; $n = 160$) and data from the second group was used for Confirmatory Factor Analysis (CFA; $n = 160$).

Measures

The first group completed the new Adult Attachment Scale (AAS) and the measures selected for construct validation, and the second group completed Adult Attachment Scale (AAS) only. Of the measures for construct validation, three measures, namely Psychological Well-being Scale (PSW; Ryff & Keyes, 1995); Emotional Stability (ES) Subscale of Emotional Maturity Scale (EMS; Singh & Bhargava, 1990); and Rosenberg's Self-esteem Scale (RSES; Rosenberg, 1965); were used for assessing convergent validity, whereas the measures, such as Depression Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995); Interpersonal Relations (IR) Subscale of Outcome Questionnaire-45 (OQ-45; Lambert et al., 2004); and Kessler Psychological Distress Scale (K10; Kessler et al., 2003); were employed for examining discriminant validity of the scale.

Adult Attachment Scale (AAS): This self-report scale identifies the dominant attachment style of adult individuals. Initial item pool consisted a total of 112 items pertaining to four subscales, i.e., Secure (e.g., I find it easy to engage myself in close relationships with others), Preoccupied (e.g., I get disappointed & angry if my close ones do not show interest in me), Fearful (e.g., I worry that I am not as good as others), and Dismissing (e.g., I prefer to be self-sufficient & free from commitment to any other person). Final scale consisted 51 Likert scale items with 5-point response patterns ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Psychological Well-being Scale (PSW; Ryff & Keyes, 1995): The scale measures psychological well-being at various levels. It consists of 18 statements and has six subscales: autonomy (e.g., I tend to be

influenced by people with strong opinions), environmental mastery (e.g., Some people wander aimlessly through life, but I am not one of them), personal growth (e.g., For me, life has been a continuous process of learning, changing, and growth), positive relations with others (e.g., Maintaining close relationships has been difficult & frustrating for me), purpose in life (e.g., Some people wander aimlessly through life, but I am not one of them), and self-acceptance (e.g., I like most parts of my personality). Participants marked their responses on a 7-point Likert scale from 1 (*strongly agree*) to 7 (*strongly disagree*). The higher the score on each subscale, the higher the level of well-being in the respective area. Cronbach's alpha for psychological well-being in the present sample was 0.85, and that for the subscales ranged between 0.40 and 0.64.

Emotional Stability (ES) Subscale of Emotional Maturity Scale (EMS; Singh & Bhargava, 1990): The Emotional Stability subscale of the Emotional Maturity Scale measures the capacity to acquire an integrated and balanced perspective on life's difficulties. This subscale consists of 10 questions (e.g., Are you involved in mental botherations?), and the participants responded to the questions on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). The higher the scale score, the greater the level of emotional stability. Cronbach's alpha of the scale on the current sample was 0.87.

Rosenberg's Self-esteem Scale (RSES; Rosenberg, 1965): The scale measures the global self-esteem of an individual. It consists of 10 statements (e.g., On the whole, I am satisfied with myself) with a 4-point Likert scale with response patterns ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). A higher scale score indicates greater self-esteem. Cronbach's alpha of the scale on the present sample was 0.89.

Depression Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995): The scale measures levels of emotional distress with three subscales: Depression (e.g., I couldn't seem to experience any positive feeling at all), Anxiety (e.g., I was aware of dryness of my mouth), and Stress (e.g., I found it hard to wind down). This 21-item scale has seven items assigned for each subscale with four severity/frequency options ranging from 0 (*did not apply to me at all*) to 3 (*applied to me much, or most of the time*). Scores for each subscale are computed by adding the values for the respective items. A high score on a given subscale indicates higher level of the particular type of emotional distress in the individual as measured by the subscale. On the present sample, Cronbach's alpha for the subscales Depression, Anxiety, and Stress scale ranged between 0.83 and 0.89.

Interpersonal Relations (IR) Subscale of Outcome Questionnaire-45 (OQ-45; Lambert et al., 2004): The Interpersonal Relations subscale of the Outcome Questionnaire-45 reflects problems in interpersonal relations. This subscale consists of 11 statements (e.g., I get along well with others) that measure friction, conflict, inadequacy, and withdrawal in relationships. The response options of this 4-point Likert scale ranged from 0 (*never*) to 4 (*always*). A score higher than 16 denotes significant problems in interpersonal relationships. Cronbach's alpha of the scale on the current sample was 0.84.

Kessler Psychological Distress Scale (K10; Kessler et al., 2003): This scale assesses psychological distress. It consists of 10 questions, and the participants responded (e.g., In the past four weeks, about how often did you feel tired out for no good reason?) on a 5-point Likert scale with responses ranging from 1 (*none of the*

time) to 5 (*all of the time*). The higher the score, the greater the psychological distress. Cronbach's alpha of the scale on the current sample was 0.95.

Procedure and Data Collection

All the participants were selected after seeking consent from them to take part in the study. The informed consent form specified the purpose of the survey, the confidentiality of participants' information, the anonymity of the data, the right to withdraw, and the right to decline from the research at any time. The researcher ensured that all participants read and signed the written informed consent form before participating in the study. Only those who voluntarily consented to participate in the study between the ages of 25 and 45 years were included. The instruments were then administered to the participants included in the sample.

Procedure for the Scale Development Process

The phases of the scale development process are presented in Figure 2.

Phase 1: Scale Development. An extensive literature review was carried out to gain a more concrete understanding of the attachment construct by identifying conceptual definitions of each dimension and relevant empirical items that describe each dimension. The new scale was intended to be developed by adopting Bartholomew's four-category model of attachment, rooted in Bowlby's (1969) original theory. Adult Attachment Scale (AAS) is a self-report measure with declarative statements. Likert scale is used for the AAS with 5-point response pattern ranging from 1 to 5, such as 1 (*not at all*), 2 (*not really*), 3 (*undecided*), 4 (*somewhat*), and 5 (*very much*).

An initial item pool was generated with 112 items pertaining to the four subscales, viz., Secure consisting of 30 items, Preoccupied consisting of 28 items, Fearful consisting of 26 items, and Dismissing consisting of 28 items. One hundred twelve items were included in the item pool as it is ideal to have four or five times the number of items needed in the final scale (DeVellis, 2017). These items were prepared by reviewing the theoretical background and literature of the attachment and the existing measures assessing the construct. Items related to Collectivist/Indian culture were also included in each subscale, as culture is relevant as far as the attachment construct is concerned.

The content validation process was based on the feedback from 4 experts, i.e., three academics in the field of Psychology and 1 Clinical Psychologist. Each item was carefully assessed by the experts for significance, appropriateness, accuracy, and representativeness in connection with the specific subscale. They indicated the appropriateness of each item by opting for a score between 1 and 4, where 1= not appropriate, 2= least appropriate, 3= moderately appropriate, and 4= most appropriate. After the minor linguistic corrections of a few items to ensure the clarity, objectivity, and comprehensiveness of the proposed scale, all 112 items were retained in the item pool based on the consensus of the experts. The final item pool was translated into the vernacular language of the participants, and the scale was validated by language experts who had proficiency in both languages, i.e., English and Malayalam.

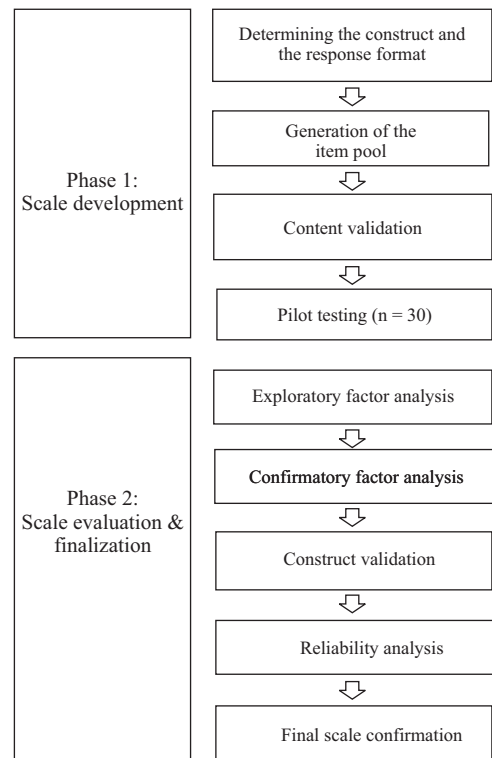
A pilot testing of the scale was then conducted on a sample of 30 adults (Males = 8, Females = 22) in the age range of 25 to 45 years ($M = 34$, $SD = 5.36$), with the purpose of evaluation and revision of items of the scale, if necessary. Cronbach's alpha of the new scale was 0.90, and that of the subscales Secure, Preoccupied, Fearful, and

Dismissing were 0.93, 0.96, 0.92, and 0.90 respectively. After pilot testing, all the items were retained in the draft AAS. Hence, the scale was found to have high internal consistency and content validity in the pilot study.

Phase 2: Scale Evaluation. Exploratory Factor Analysis (EFA) was executed using IBM SPSS 21.0 to identify the underlying factors within the AAS. The Kaiser-Mayer-Olkin (KMO) test and Bartlett's sphericity test were used to determine sampling adequacy and establish the suitability of materials for EFA. Varimax rotation was utilized as the extraction method for the 112 items of the AAS since the possible factors were assumed to be uncorrelated with one another. The following goodness of fit indices were used for the Confirmatory Factor Analysis (CFA): Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Root mean square error of approximation (RMSEA), Tucker Lewis Index (TLI), and Standardized root mean square residual (SRMR). The internal consistency of the scale and the subscales were analyzed using Cronbach's alpha. Pearson's correlation coefficient was used to determine the construct validity of the scale, i.e., convergent and discriminant validity. After the development, reliability analysis, and content and construct validation, the number of items in the initial draft scale was reduced and the scale was finalized with 51 declarative statements pertaining to 4 subscales: Secure, Preoccupied, Fearful, and Dismissing.

Figure 2

Adult Attachment Scale (AAS) Development and Evaluation



Results

Exploratory Factor Analysis

The factorability or analytic suitability of the data was confirmed by using the Kaiser-Meyer-Olkin Measures of Sampling Adequacy (KMO), which was equal to 0.92, and Bartlett's Test of Sphericity,

which was equal to 10997.62, $p < .05$. An initial Exploratory Factor Analysis (EFA) result identified a 22-factor list of variables. However, to achieve a concise solution, EFA was then repeated after eliminating those items with factor loading below 0.5 and it yielded a 4-factor structure. It was estimated to be optimal in terms of the variance accounted for (50.42%), simple structure, and interpretability. For attaining simple structure, the obtained factors

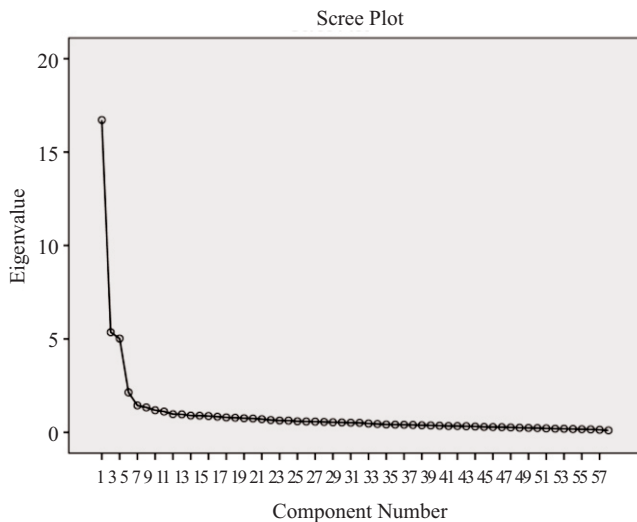
were rotated through Varimax rotation criterion. Items that have factor loading below 0.5 are discarded from the scale which resulted in 56 items. The four-factor loadings after Exploratory Factor Analysis are presented in Table 1. From the scree plot (see Fig. 3) a four-factor solution is determined. The eigenvalues of four factor solution were 16.72, 5.36, 5.02 and 2.14 with the variances of 28.83%, 9.24%, 8.66% and 3.69%, respectively.

Table 1

Factor Loadings by Exploratory Factor Analysis (EFA)

Factors and items		Factor loadings			
		1	2	3	4
Factor 1: Preoccupied					
44	I often worry about being abandoned by others.	.73			
51	I feel anxious and insecure, when I am not in close relationships with others.	.71			
43	I wonder how I would manage without someone who cares for me.	.70			
38	I feel depressed when my close ones are not around me to the extent I want them.	.70			
50	I worry that others would hurt me by ending relationship abruptly.	.70			
42	I worry a lot about losing my close ones.	.69			
46	I feel bad about being rejected by others.	.68			
40	I am afraid about being alone.	.67			
45	I constantly need reassurance from my close ones that I am loved by them.	.67			
34	I get frustrated when my close ones are unavailable when I need them.	.67			
33	I get disappointed and angry, whenever if my close ones do not show interest in me.	.65			
52	I desire that all my close ones should be very intimate and fully committed towards me.	.64			
36	I often think much about whether people will like me or not.	.63			
54	I think it is difficult for me to take a decision without bothering what others think.	.63			
37	I wish to get close to others, but I am scared of being hurt in relationships.	.62			
35	I worry a lot about my relationships	.59			
48	I would like to stop doing things that others won't like.	.58			
53	I worry that others will not like me when they get to know me more.	.58			
56	I am afraid that people will lose interest in me if I am not in constant touch with them.	.58			
47	I resent it when my close ones spend time without me.	.57			
Factor 2: Dismissing					
103	It is important for me to have personal freedom and space in my life.		.83		
101	I think it's always important to set goals in life.		.82		
88	Generally, I am a confident person.		.79		
105	I prefer not to let others know how I really feel		.76		
104	Left to myself, I rarely feel distressed or emotionally down.		.71		
87	In times of need, I can help myself rather than seeking help from others.		.70		
77	As others have their own issues in life, I don't disturb them with mine.		.67		
97	Others want me to be closer to them than I am comfortable with.		.69		
85	I prefer to be self-sufficient and free from commitment to any other person.		.68		
98	Usually, I don't depend on others for my own needs.		.66		
93	If I am up to any work, I must do it no matter who gets hurt.		.58		
58	I feel happier when I get more acceptance from people I relate with.		.56		
Factor 3: Secure					
11	I feel that other people consider me as a lovable person.			.67	
14	I freely express my feelings to all people close to me.			.66	
15	I consider my relationships with others are very rewarding.			.66	
13	I think it is important for people to depend on each other.			.65	
12	Generally, others like and respect me.			.64	
2	I feel comfortable with depending on others for advice and help.			.63	
5	Getting emotionally close to others is not difficult for me.			.61	
1	I find it easy to engage myself in close relationship with others.			.61	
9	I feel that others consider me as a person of worth.			.61	
19	Most of the people I know are generous and supportive.			.59	

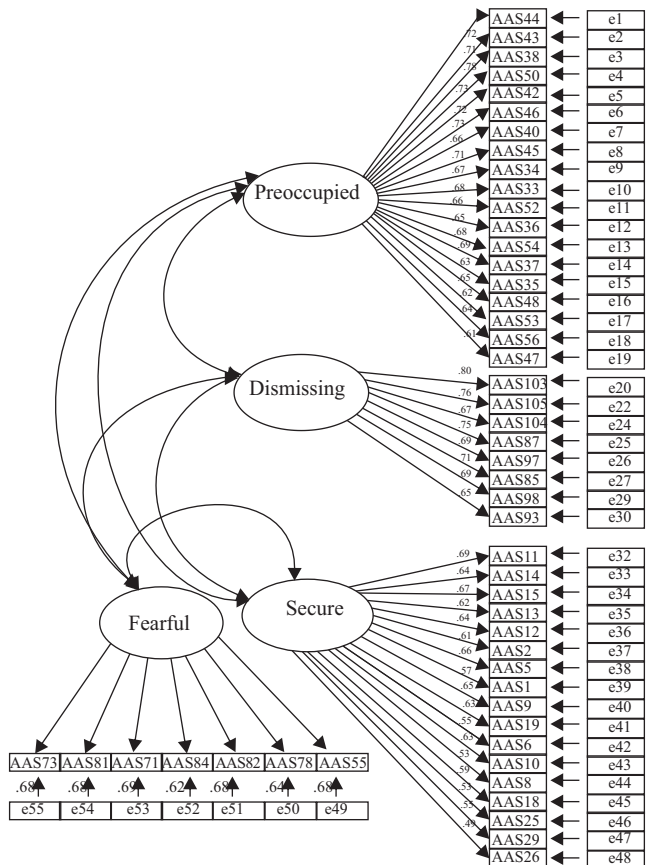
6	I share and discuss my problems with my close ones.	.59
10	I am easier to be understood than many others.	.58
8	I don't mind when others depend on me for any help.	.58
18	I am not afraid about others getting emotionally closer to me.	.57
25	I usually look at the positive aspect of relationships.	.57
29	In case of any emergency, I don't mind in seeking help from my relatives and neighbours.	.57
26	I enjoy spending time with my relatives and neighbours.	.52
Factor 4: Fearful		
73	I feel I am a worthless person.	.68
81	I consider it unfortunate that my friends' circle is very small.	.63
71	I think that I will not be successful in maintaining a relationship even if I tried.	.63
84	I am scared that people will judge me, if I don't have more friends.	.62
82	I spend most of my time alone, though I am not happy being so.	.61
78	I am afraid of getting embarrassed when I interact with people.	.60
55	I worry that I am not as good as others.	.51

Figure 3*Scree Plot Indicating Four-Factor Model for the AAS***Confirmatory Factor Analysis**

Confirmatory Factor Analysis (CFA) was utilized to test the accuracy of the structure determined by EFA, for which the data from second group is used. It was applied to test the factorial structure of the model determined by EFA (Gomez & Fisher, 2003). Five items were excluded after performing CFA to obtain a better fit, which resulted in a 51-item scale with four subscales, such as Secure (17 items), Preoccupied (19 items), Fearful (7 items), and Dismissing (8 items). A series of indices, such as Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), were used to examine the fit of the model, which were found to be 0.87, 0.91, and 0.89 respectively, as shown in Table 2. These indices need to be above 0.90, and as these values are close to 0.90, they can be accepted (Bentler & Bonett, 1980). For a model to have a good fit, the values of Root mean square error of approximation (RMSEA), and Standardized root mean square residual (SRMR) have to be close to or below 0.05. In the CFA model, both these values were 0.06 and 0.05 respectively. As CFI is 0.91, this 4-factor model was found to have an acceptable fit. The confirmatory analysis diagram is illustrated as Figure 4.

Table 2*Model Fit Indices of the AAS Model*

Indices	Values
Goodness of Fit Index (GFI)	0.87
Comparative Fit Index (CFI)	0.91
Root Mean Square Error of Approximation (RMSEA)	0.06
Tucker-Lewis Index (TLI)	0.89
Standardized Root Mean Square Residual (SRMR)	0.05

Figure 4*Confirmatory Factor Analysis (CFA) Diagram of the AAS*

Internal Consistency of the Scale

The internal consistency of the scale and subscale was assessed by using Cronbach's alpha. As shown in Table 3, the Cronbach's alpha of AAS was 0.87, and that of the subscales Secure, Preoccupied, Fearful, and Dismissing were 0.91, 0.94, 0.85, 0.89 respectively. The finding of internal consistency shows that the new AAS has a high reliability.

Table 3

Reliability Statistics of AAS and Subscales

Scale and subscales	N of items	Cronbach's Alpha
Adult Attachment Scale (AAS)	51	0.87
Secure subscale	17	0.91
Preoccupied subscale	19	0.94
Fearful subscale	7	0.85
Dismissing subscale	8	0.89

Construct Validity of the Scale

The 4-factor scores from the 51-item AAS were correlated with the measures listed in the measures section presented elsewhere.

Pearson correlation was utilized to analyze the construct validity of the scale, i.e., convergent and discriminant validity. Convergent validity demonstrates whether a test designed to examine a specific construct corresponds with other tests designed to measure a similar construct, whereas discriminant validity determines whether a test designed to evaluate a specific construct does not correlate with tests designed to measure different constructs. Table 4 shows the correlations of the four factors of the AAS with other measures. As shown in Table 4, Secure subscale was positively correlated with psychological well-being, autonomy, environmental mastery, personal growth, positive relationship with others, purpose in life, self-acceptance, self-esteem, and emotional stability, whereas Preoccupied, Fearful, and Dismissing subscales negatively correlated with these variables. Preoccupied, Fearful, and Dismissing subscales positively correlated with depression, anxiety, stress, problems in interpersonal relations, and psychological distress, whereas a significant negative correlation was found between Secure subscale and these specified variables. These findings demonstrated the convergent and discriminant validity, by which the construct validity of the scale was established.

Table 4

Correlations of the Factors of the Adult Attachment Scale (AAS) with Other Measures

Measures	Factor 1: Preoccupied	Factor 2: Dismissing	Factor 3: Secure	Factor 4: Fearful
PWS ^a -Autonomy	-0.45**	-0.28**	0.36**	-0.33**
PWS-Environmental mastery	-0.45**	-0.33**	0.44**	-0.39**
PWS-Personal growth	-0.26**	-0.16**	0.30**	-0.29**
PWS-Positive relationship with others	-0.42**	-0.33**	0.52**	-0.42**
PWS-Purpose in life	-0.32**	-0.40**	0.22**	-0.17**
PWS-Self-acceptance	-0.48**	-0.35**	0.47**	-0.45**
PWS Total	-0.52**	-0.41**	0.51**	-0.45**
RSES ^b	-0.54**	-0.41**	0.50**	-0.46**
DASS ^c -Depression	0.53**	0.34**	-0.46**	0.50**
DASS-Anxiety	0.50**	0.35**	-0.38**	0.41**
DASS-Stress	0.56**	0.46**	-0.46**	0.47**
IR ^c	0.54**	0.49**	-0.49**	0.47**
K10 ^d	0.50**	0.37**	-0.41**	0.42**
ES ^e	-0.53**	-0.48**	0.47**	-0.40**

Note. PWS^a - Psychological Well-being Scale; RSES^b - Rosenberg's Self-esteem Scale; DASS^c - Depression Anxiety Stress Scale; IR^c - Interpersonal Relations Subscale of Outcome Questionnaire-45; K10^d - Kessler Psychological Distress Scale; ES^e - Emotional Stability Subscale of Emotional Maturity Scale, ** $p < .01$

Discussion

This study aimed to develop Adult Attachment Scale (AAS) and validate the scale in Indian adult population. The newly developed scale is intended to identify the dominant attachment style of adults. This scale was conceptually based on Bartholomew's theoretical framework of attachment that centered on two types of internal working model: representations of 'self' and 'others.'

To explore the psychometric properties of AAS, approaches such as structural validity, internal consistency reliability, and construct validity have been employed. Estimations of the internal consistency indicated that the scale is a reliable measure to serve its purpose. Exploratory Factor Analysis results provided a four-factor solution which was found to be consistent with the proposed four-domain

theoretical framework. A good fit was confirmed by the Confirmatory Factor Analysis for this four-factor model.

While examining the attachment research, many studies broadly distinguished attachment patterns as secure and insecure, where insecure included preoccupied, dismissing, and fearful attachment styles. Nevertheless, there is a great deal of studies in contemporary psychology research that explored all four of these attachment styles. The subscales of the scale were found to be significantly correlated with the similar or contrasting constructs of other measures selected for assessing convergent and discriminant validity respectively. Hence, the findings of the study further added to the body of evidence supporting the construct validity, i.e., convergent validity and discriminant validity of the AAS.

The factor structure of the Adult Attachment Scale (AAS) represents four adult attachment styles. First, second, third, and fourth factors extracted were Preoccupied, Dismissing, Secure, and Fearful respectively. Preoccupied factor denotes negative 'self' and positive 'others' representations, according to Bartholomew's four-category model of attachment. In the present study, the Preoccupied subscale was significantly positively correlated with the constructs selected to assess convergent validity, such as, depression, anxiety, stress, problems in interpersonal relations, and psychological distress. Also, this subscale was significantly negatively correlated with the constructs selected to assess divergent validity, such as psychological well-being, autonomy, environmental mastery, personal growth, positive relationship with others, purpose in life, self-acceptance, self-esteem, and emotional stability. Previous research has shown that individuals with preoccupied attachment are prone to psychological problems (Creasey, 2005; Ponizovsky et al., 2013); loneliness, psychological distress, lower self-esteem, lower well-being (Kawamoto, 2020); anxiety (Ponizovsky et al., 2013); and depression (Fattouh et al., 2022; Pielage et al., 2005). Also, they find it difficult to be close in relationships (Pielage et al., 2005) and have poor interpersonal relationship quality (Homan, 2018). They display lower levels of autonomy (Marrero-Quevedo et al., 2019) self-acceptance, personal growth, purpose in life, and environmental mastery (Homan, 2018). The findings of this study are thus consistent with the prior research demonstrating the relationship between preoccupied attachment style and various psychological constructs.

Dismissing factor implies positive 'self' and negative 'others' representations. Previously reported findings have supported the present findings of significant relationship between the Dismissing subscale and other psychological constructs used in the study for construct validation. Dismissive subscale was found to have a significant positive correlation with depression, anxiety, stress, problems in interpersonal relations, and psychological distress. This subscale was also found to have significant negative correlation with psychological well-being, autonomy, environmental mastery, personal growth, positive relationship with others, purpose in life, self-acceptance, self-esteem, and emotional stability. Although there are studies indicating that dismissing individuals experience moderate satisfaction in life (Dugan et al., 2023); they were reported as leading a less social (Odacı & Çıkrıkçı, 2014); and unsatisfied emotional life (Dugan et al., 2023). Also, they experienced distress (Bottonari et al., 2007; Obeid et al., 2019); problems in social relationships (Collins & Feeney, 2000; Odacı & Çıkrıkçı, 2014); and depression (Bottonari et al., 2007; Fattouh et al., 2022; Tremblay & Sullivan, 2010). It is evident that the results of this study are in line with the existing literature that investigated the association between dismissing attachment and other relevant variables related to mental health and relationships.

Secure factor refers to positive 'self' and 'others' representations. The finding that the Secure subscale is significantly correlated with the constructs in the selected measures are supported by several studies. This subscale was positively correlated with the constructs chosen for convergent validity, such as psychological well-being, autonomy, environmental mastery, personal growth, positive relationship with others, purpose in life, self-acceptance, self-esteem, and emotional stability. It was also found that the Secure subscale was negatively correlated with the constructs selected to assess divergent validity, such as depression, anxiety, stress,

problems in interpersonal relations, and psychological distress. Secure individuals are more likely to maintain intimacy in close relationships (Kachadourian et al., 2004; Pielage et al., 2005) and their relationships are more likely to be stable and accessible. They also exhibited higher self-esteem (Marrero-Quevedo et al., 2019; Huntsinger & Luecken, 2004; Park et al., 2004); autonomy (Levine et al., 2021; Merz & Consedine, 2009); psychological health, well-being, perceived authenticity, self-determination (Leak & Cooney, 2001); environmental mastery, and self-acceptance (Marrero-Quevedo et al., 2019). Moreover, they experienced less psychological distress (Pielage et al., 2005) anxiety, or depression (Armour et al., 2011; Fattouh et al., 2022). It is worth noting that the present findings linking secure attachment and other psychological variables, namely psychological well-being, autonomy, environmental mastery, personal growth, positive relationship with others, purpose in life, self-acceptance, self-esteem, emotional stability, depression, anxiety, stress, problems in interpersonal relations, and psychological distress, are well-supported by the earlier research on secure attachment.

Fearful factor involves negative 'self' and negative 'others' representations. In line with the present results on Fearful subscale, prior research have demonstrated that those with fearful attachment experience emotional instability, poor self-acceptance (Marrero-Quevedo et al., 2019); lower self-esteem, lower well-being (Kawamoto, 2020); psychological distress (Bottonari et al., 2007; Kawamoto, 2020); and depression (Bottonari et al., 2007). The present finding of significant positive correlation between the Fearful subscale and the constructs, such as depression, anxiety, stress, problems in interpersonal relations, and psychological distress, established the subscale's convergent validity. Conversely, significant negative correlation found between the Fearful subscale and the constructs, such as depression, anxiety, stress, problems in interpersonal relations, and psychological distress demonstrated the divergent validity of the subscale. These findings of significant relationship between the Fearful subscale and the constructs selected for construct validation confirms the existing findings on the fearful attachment in the literature.

As the findings of the study suggest that Adult Attachment Scale (AAS) is developed and validated with adequate psychometric properties, the scale can be used in the subsequent studies where adult attachment styles are to be explored.

Implications of the Study

Although attachment theory has its roots in the developmental psychology, it has a significant influence in the field of social psychology with its broad applicability in exploring interpersonal relationships, social behaviors, emotion regulation, and personality. Being a four category scale, this would be an ideal scale to classify individuals into one of the four adult attachment styles. It can serve as an effective tool for researchers in the field of psychology by resolving the issues like poor reliability of the existing measures and the underrepresentation of the construct. Research can be extended with further evidences of psychometric properties of the scale, such as concurrent validity, predictive validity, criterion validity, and test-retest reliability. Considering the impact of specific attachment styles on social adaptation and personality, clinicians and mental health professionals can plan and implement new attachment-based intervention modules. In light of the 'Broaden-and-Build' cycle of attachment security, enhancement of sense of security can have

substantial effect on fostering the positive working models of 'self' and 'others' (Mikulincer & Shaver, 2020). Such interventions will be effective in developing adaptive skills and equipping individuals to manage their adversities and life challenges and thereby promoting resilience. In addition, insights about the theory and practice of attachment in different systems, such as parenting, marital relationship, or workplaces, can be utilized to design policies and programs addressing specific groups, thereby ensuring the holistic well-being.

Limitations of the Study

When interpreting the present study's findings, certain limitations should be noted. First, the sample taken for this study is a convenience sample, which does not account for the randomization and thus limits the generalizability of the findings. Second, the development and validation of the scale were carried out by utilizing self-report data, which could be influenced by social desirability bias of participants.

Conclusion

Adult Attachment Scale (AAS) is developed with 51 items comprising of 4 subscales: Secure, Preoccupied, Fearful, and Dismissing. It is a self-report measure with responses ranging from 'strongly disagree' to 'strongly agree' on a 5-point Likert scale. AAS is found to have strong psychometric properties, such as high internal consistency, content validity, and construct validity. Therefore, this scale can be a useful measure to identify the dominant attachment style of individuals.

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