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Factorial Structure of the Brazilian Adult Attachment Scale (Ebrapeg-A 34)

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Abstract

Attachment begins in the early years of life and is linked to human development. The assessment of attachment requires the use of reliable instruments. Objective: to investigate the internal structure of the Brazilian Adult Attachment Scale. Internal structure was assessed through exploratory (EFA) and confirmatory (CFA) factor analysis with participants of both sexes from the general population (n = 808). The scale presented good fit indexes for four factors, explaining 48.89% of the variance (EFA / CFA: RMSEA = 0.0357 / RMSEA = 0.065; CFI = .925; TLI = .918 / CFI = .920; TLI = .914). The final version presented 34 items, and its factors demonstrated good reliability indexes: Secure α = .84; Fearful α = .88; Preoccupied α = .89; Dismissing α = .83. The EBRAPEG-A 34 constitutes a relevant tool for psychologists working in clinical and mental health contexts.

Keywords: object attachment, adult, self-report, psychometrics, validation study

ESTRUTURA FATORIAL DA ESCALA BRASILEIRA DE APEGO—ADULTO 34 (EBRAPEG-A 34)

Resumo

O apego se inicia desde os primeiros anos de vida, atrelado ao desenvolvimento humano. Sua avaliação requer o uso de instrumentos confiáveis. Objetivo: apresentar a estrutura interna da Escala Brasileira de Apego-Adulto. A estrutura interna foi acessada via análise fatorial exploratória (AFE) e confirmatória (AFC) com participantes de ambos os sexos oriundos da população geral (n = 808). Apresentou bons índices de ajuste para 4 fatores, capazes de explicar 48,89% da variância dos dados (AFE/AFC: RMSEA = 0,0357 / RMSEA = 0,065; CFI = 0,925; TLI = 0,918 / CFI = 0,920; TLI = 0,914). A escala final apresentou 34 itens e seus fatores demonstraram bons índices de confiabilidade: seguro α = 0,84; temeroso α = 0,88; preocupado α = 0,89; desinvestido α = 0,83. A EBRAPEG-A 34 apresenta-se como uma ferramenta relevante aos psicólogos atuantes em contextos clínicos e de saúde mental.

Palavras-chave: apego ao objeto, adulto, autorrelato, psicometria, estudo de validação

ESTRUCTURA FACTORIAL DE LA ESCALA BRASILEÑA DE APEGO AULTO (EBRAPEG-A 34)

Resumen

El apego comienza desde los primeros años de vida, vinculado al desarrollo humano, su evaluación requiere el uso de instrumentos confiables. Objetivo: presentar la estructura interna de la Escala Brasileña de Apego del Adulto. Se observó la estructura interna mediante análisis factorial exploratorio (AFE) y confirmatorio (AFC) con participantes de ambos sexos de la población general (n = 808). La escala presenta buenos índices de ajuste para 4 factores, explicando el 48,89% de la varianza (AFE / AFC: RMSEA = 0.0357 / RMSEA = 0.065; CFI = 0.925; TLI = 0.918 / CFI = 0.920; TLI = 0.914). La versión final, con 34 ítems y sus factores presentabuenos índices de confiabilidad: seguro α = 0,84; temeroso α = 0.88; preocupado α = 0,89; desinteresado α = 0,83. EBRAPEG-A 34 se presenta como una herramienta relevante para los psicólogos que trabajan en contextos clínicos y de salud mental.

Palabras-clave: apego a objetos, adulto, autoinforme, psicométrico, estudio de validación

Attachment can be considered the physical and psychological connection between individuals. According to Bowlby (1980, 1989), it commences in the early months of life and extends until death. In attachment, seeking proximity is adaptable and coherent with the environment. Crying or the child's approach to the caregiver figure are evolutionary behaviors that may correspond to preserving the species. Attachment behavior is activated coherently with the need for care, whether in moments of vulnerability or the modulation of the interaction with emotions. Throughout life, these behaviors change, becoming more complex (Baptista et al., 2021).

Early studies on attachment focus on the relationship between mothers and their babies. Building on observational studies, Ainsworth et al. (1978) concluded that the child connected more harmoniously with the caregiver in interactions where consistent and responsive care was provided. However, inconsistent, threatening, or unresponsive care made the child more anxious or avoidant in interacting with the caregiver. Consequently, the authors established an initial classification of three attachment patterns reflecting security, anxiety, and avoidance, with a greater environmental emphasis.

Bowlby (1980) emphasizes attachment development and how child bonds are provided through internal working models related to the self and others. This means that when a child is in the presence of an adult they trust for security and protection, how that adult interacts provides scripts on how to behave, allowing the child to make predictions and hypotheses about what to expect from this figure. This lays the foundation for the child's self-view and view of others. Accordingly, threatening care can create insecurities in self-interaction and with the world, while responsive care provides the basis for developing a secure attachment pattern.

Besides expressing how people bond in adulthood, attachment patterns can represent how individuals deal with the environment and difficulties throughout their lifespan. Individuals with a secure attachment style tend to have more favorable strategies to handle stressful events than those with an insecure attachment style (Eikenæs et al., 2016). The literature demonstrates the connection between attachment and other variables, such as family support, significantly influencing one's perception of the self and others. Unsupportive relationships in childhood may generate insecure attachment styles and present significant associations with depressive symptoms, low self-esteem, eating disorders, substance abuse, and other complications in adulthood (Mikulincer & Shaver, 2016; Fonagy et al., 2011; Schindler, 2019; Hayre et al., 2019; Cassidy et al., 2013; Williams et al., 2019).

Decades after the inception of attachment theory, interest grew in evaluating the construct in adults. Some effects of attachment are witnessed in romantic partnership choices. Classic research in this area suggests that patterns developed during childhood serve as a model for constructing adult relationships (Hazan & Shaver, 1987). Apart from romantic relationships, attachment significantly impacts the development of parental practices in adulthood. An individual's attachment style can have a relevant impact on their behaviors and interactions with their children. Those with a secure attachment often demonstrate responsive parenting approaches, fostering security and autonomy in their relationships (Sesti Becker et al., 2019).

For this public, some gold-standard psychometric instruments exist, including the Experience in Close Relationships (ECR, Hazan & Shaver, 1987) and the Relationship Scale Questionnaire (RSQ, Griffin & Bartholomew, 1994). Both scales can extract two primary models. First, based on Mary Ainsworth's studies, Hazan and Shaver's typological model (ECR, 1987) evaluates attachment in intimate relationships with secure, avoidant, and anxious-ambivalent patterns. Second, the four-factor model (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994), emphasizing Bowlby's thinking, proposes a theoretical division between self and others. This model uses secure, preoccupied, fearful, and dismissing attachment styles, expanding the initial three-factor structure. Although not directly comparable due to their theoretical roots, these models serve as different approaches for evaluating attachment.

However, the four-factor models have shown empirical sustainability challenges, leading authors to adopt alternative models corresponding to three factors (Andersen et al., 2017; Assis et al., 2019; Zortea et al., 2019). Therefore, using the three-factor model has become more frequent in the literature (Shiramizu et al., 2013; Natividade et al., 2015; Rocha et al., 2017; Teixeira et al., 2019). Despite the good indices associated with this model, the interest in exploring other nuances of insecure attachments has been sustained in the literature over decades (Collins & Read, 1990; Karantzas et al., 2010). A review of the models and instruments available in the literature for the evaluation of attachment can be found in the study by Tartaro and Baptista (2021).

Observing this problem in the literature, the Brazilian Adult Attachment Scale (Escala Brasileira de Apego-Adulto, Tartaro, 2021) was constructed for the Brazilian context with items in Portuguese. Initially, there was a proposal to create an instrument with the following five factors: Secure, Fearful, Dismissing, and Preoccupied (following the tradition of Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994), while also attempting to include an innovative fifth factor to measure disorganized attachment (derived from the works of Main & Solomon, 1986). However, since the initial investigations, the instrument has shown better suitability for a classical four-factor solution (Tartaro, 2021).

In the model followed by the instrument, the pattern of secure attachment is understood as a positive view of the self (self-positive) and others (other positive), characterized by adaptive regulation of emotions and the ability to establish physical and emotional closeness in interpersonal relationships, with better emotional regulation and mentalization (Bowlby, 1989; Fonagy et al., 2011). Insecure attachments are subdivided into three categories: fearful attachment refers to a perception of care that is critical, rejecting, or lacking affection, resulting in a negative view of the self and others. Adults with this type of attachment yearn for social relationships; however, they are frequently frustrated by their fears of intimacy and rejection (Bartholomew & Horowitz, 1991; Williams et al., 2018).

In dismissing attachment, individuals tend to keep others at a distance, valuing achievements in other areas of life at the expense of close relationships. This is seen as a possible adaptation to experiences of rejection from caregivers. Adults adapt through excessive regulation

of affect and distraction strategies, focusing away from attachment relationships and reflecting a positive view of the self but a negative one of others. Conversely, in the preoccupied style, to ensure the attention of attachment figures, the individual exaggeratedly expresses their emotions and constantly tries to maintain the attention of attachment figures, neglecting the development of autonomy and exploration of the environment. Positive feelings are frequently mixed with feelings of anxiety. This style reflects a negative view of the self but a positive one of others (Bartholomew & Horowitz, 1991; Bowlby, 1980).

Accordingly, through those mentioned above, the present study aimed to present initial investigations regarding the internal structure of the Brazilian Adult Attachment Scale (EBRAPEG-A). The instrument is expected to show at least four factors in line with the theoretical four-factor model.

Method

Participants

The sample was composed non-probabilistically (by convenience) and consisted of 808 participants from the general population, aged between 18 and 67 years (M = 28.8; SD = 10.1) from various regions of Brazil, with a prevalence in the southeastern region (81.0%). Regarding gender, 82.4% of the respondents were female. Concerning marital status, the sample predominantly consisted of single people (69.6%). Regarding education, 53.2% reported having completed higher education, while 45.2% had completed high school.

Instruments

Brazilian Adult Attachment Scale (Escala Brasileira de Apego-Adulto – EBRAPEG-A) 93-item version (Tartaro, 2021).

The instrument was constructed with items in Brazilian Portuguese, adopting a theoretical model of four factors: Secure, Preoccupied, Fearful, and Dismissing (Bartholomew, 1990; Griffin & Bartholomew, 1994), with the inclusion of an additional factor (Main & Solomon, 1986) for disorganized attachment. The first version of the instrument comprised 149 items, which was applied with a pilot sample and evaluation by judges with PhDs in the field of Psychological Assessment, resulting in an initial version of 93 items. The instrument's response key follows a Likert-type standard with four scores: "Strongly Disagree," "Disagree," "Agree," and "Strongly Agree."

Consent form. The document contained information about the study and conditions of voluntary participation.

Procedures

Initially, the project was submitted to the ethics committee of Universidade São Francisco (CAAE 20056019.1.0000.5514). The general sample was accessed through electronic forms distributed on social networks and by email. After consenting to the research via the consent

form, participants responded to the EBRAPEG-A. Data collection took place from the second semester of 2019 to the end of the second semester of 2020.

Data was analyzed using the SPSS (version 25.0) and Mplus (version 7.11) programs. The database was then randomly divided, allocating 65% (Sample 1) of the total for parallel analyses (PA) and exploratory factor analyses (EFA) and 35% (Sample 2) for confirmatory factor analysis (CFA).

The initial analysis round consisted of PA followed by EFA using the Unweighted Least Squares (ULS) estimation method based on polychoric correlation matrices. The Oblimin rotation method was employed. Item tabulation and selection were conducted based on the items showing better factor loadings and suitable grouping according to the theoretical model. The subsequent step involved conducting CFA using the Weighted Least Mean Square Algorithm (WLMS) as an estimator. The model's adequacy was assessed using the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) fit indexes. Lastly, reliability analysis was conducted using Cronbach's α test.

Results

For sample 1, composed of 65% of the total data (n = 525), the results indicated the retention of up to five factors, as shown in Table 1.

Table 1

Results of the Parallel Analysis

Factors	Percentage of real data variance explained	Percentage of random data variance explained (95% CI)
1	24.4123*	2.4898
2	12.9809*	2.3958
3	7.3279*	2.3172
4	4.1755*	2.2577
5	3.0768*	2.2046
6	1.9363	2.1582
7	1.8131	2.1131

Five factors were estimated from the real data and exhibited higher explained variances compared to those verified in the mean in the random matrices and higher explained variance values of the factors estimated from the random matrices at the 95th percentile. The data showed a Kaiser-Meyer-Olkin (KMO) index of .951 and Bartlett's test of sphericity of 6069.2 (df = 4278; p = < .001).

Subsequently, following the Parallel Analysis (PA), which suggested the number of factors corresponding to the theoretical expectations that underpinned the development of the EBRAPEG-A, an exploratory factor analysis (EFA) was conducted. Although the initial parallel

analysis indicated the retention of 5 factors, there were cross-loadings in the EFA (with correlations above .30).

Therefore, it was necessary to resort to a 4-factor solution, where 59 items were excluded due to cross-loadings above .30. This adjustment brought the instrument closer to the theoretical four-factor model. Following removing these items, the items began to show appropriate factor loadings for their respective factors, and the pattern of cross-loading was considerably reduced. The fit indices via EFA were adequate (χ^2 = 6668.982, df = 3912; p < .001; RMSEA = 0.0357; CFI = .925; TLI = .918), and the structure was capable of explaining 48.89% of the total variance in the data.

Table 2

Factor Structure of the Brazilian Adult Attachment Scale via Exploratory Factor Analysis

Item	Fearful	Preoccupied	Secure	Dismissing
I01	**.648***	−.002	−.145*	.002
I02	**.708***	.129*	−.013	−.070
I05	**.620***	−.006	.047	.029
I07	**.798***	.010	.048	−.106*
I08	**.743***	.063	−.056*	−.034
I15	**.748***	.020	−.009	.036
I34	**.707***	−.101*	.004	.007
I47	**.705***	−.145*	.047	.016
I56	**.703***	−.100*	.127*	−.123*
I73	**.674***	.037	−.085*	.096*
I24	−.117*	−.167*	**.602***	−.040
I26	.057	−.250*	**.709***	−.025
I28	−.238*	−.031	**.699***	.059
I30	−.278*	.036	**.630***	−.190*
I39	−.060	−.151*	**.670***	−.074*
I46	.082*	.117*	**.630***	−.315*
I76	−.240*	.070	**.602***	−.042
I83	−.275*	.103*	**.614***	−.005
I13	−.033	**.788***	.019	.068
I16	.282*	**.664***	−.006	−.042
I23	−.020	**.898***	−.033	.022
I44	.020	**.586***	.111*	−.047
I49	.163*	**.720***	.008	.029
I61	.118*	**.755***	.065*	−.015
I75	−.043	**.823***	.094*	.029
I77	−.023	**.825***	.046	.123*
I31	.206*	−.097*	.012	**.540***
I32	.077	−.003	−.154*	**.782***
I40	.042	−.001	−.067	**.587***
I55	.115*	.034	−.026	**.677***
I60	−.073	.075	.005	**.787***
I64	−.013	.055	−.068*	**.840***
I67	.032	.040	−.007	**.647***
I88	.191*	.049	.074*	**.566***

Correlations between the factors

Fearful	−−			
Preoccupied	.313*	−−		
Secure	−.179*	−.072*	−−	
Dismissing	.316*	.043	−.279*	−−

Notes: *p < .001. The items were grouped in order by factor to facilitate visualization.

Initially, ten items loaded onto the Fearful factor, with factor loadings ranging from .64 to .79. For the Preoccupied factor, eight items loaded, ranging from .58 to .89. The Secure factor comprised eight items with loadings ranging from .60 to .70, and finally, for the Dismissing factor, eight items loaded with loadings ranging from .54 to .84 (p = < .001). Furthermore, via EFA, the factors exhibited correlations among themselves, although they were weak. The Secure factor was negatively associated with the Fearful factor (r = −.17; p = < .001), the Preoccupied factor (r = −.07; p = < .001), and the Dismissing factor (r = −.27; p = < .001). Positive correlations, albeit weak, were found between the Fearful and Preoccupied factors (r = .31; p = < .001) and between the Fearful and Dismissing factors (r = .31; p = < .001). For sample 2, which comprised 35% of the total collection (n = 283), the selected items based on EFA were grouped and ordered for CFA, as shown in Table 3.

Table 3

Factor Structure of the Brazilian Adult Attachment Scale via Confirmatory Factor Analysis

Item	Fearful	Secure	Preoccupied	Dismissing
I01	.674			
I02	.758			
I05	.695			
I07	.781			
I08	.754			
I15	.744			
I34	.605			
I47	.732			
I56	.649			
I73	.771			
I24		.658		
I26		.780		
I28		.733		
I30		.842		
I39		.667		
I46		.604		
I76		.699		
I83		.815		
I13			.743	
I16			.697	
I23			.872	
I44			.643	
I49			.823	
I61			.726	
I75			.756	
I77			.814	
I31				.622
I32				.872
I40				.745
I55				.780
I60				.738
I64				.839
I67				.714
I88				.540
Correlations between the factors				
Fearful	--			
Secure	−.400*	--		
Preoccupied	−.081	.457*	--	
Dismissing	−.499*	.561*	.0751	--

Note: All factor loadings were significant at p < .001; *p < .001.

The model replicability in the factor analysis was as expected, except for item I88; all items showed factor loadings above .60. The model fit indices were also satisfactory (χ^2 = 1081.691, df = 489; p = < .001; RMSEA = 0.065; CFI = .920; TLI = .914). In the CFA, the factors exhibited correlations among themselves, enhancing the coherence with the theoretical model and making it much more adequate when compared to the correlations obtained through EFA. The loadings were higher than those obtained in the initial procedure. The Secure factor showed a negative correlation with the Fearful (r = –.40; p = < .001) and Dismissing factors (r = –.49; p = < .001), presenting a slight increase in magnitude. The Fearful and Preoccupied factors positively correlated (r = .45; p = < .001). The Dismissing and Fearful factors (r = .56; p = < .001) also displayed a positive correlation, suggesting an association with avoidance in both factors, better captured by the restrictive CFA model.

After grouping the total items and conducting previous analyses, an internal consistency analysis was performed using Cronbach's α coefficient. The entire dataset (n = 808) with the final items yielded good results for the attachment style scales: Fearful α = .88, Secure α = .84, Preoccupied α = .89, and Dismissing α = .83. The α coefficient for the total scale was .80.

Discussion

This study aimed to present the internal structure of the EBRAPEG–A scale. Based on the procedures conducted, it was possible to affirm that this was achieved. Good indices regarding EFA and CFA were found. It is essential to note that certain reference values are expected for the results of factor analyses. For instance, the Kaiser–Meyer–Olkin (KMO) index assesses sample adequacy. Values above .70 are considered appropriate, confirming the adequacy of the sample data (KMO = .951) (Muthén & Muthén, 2012).

Regarding the Root Mean Square Error of Approximation (RMSEA), values close to or below 0.06 are anticipated. The EFA and CFA showed values within this parameter (RMSEA = 0.0357; RMSEA = 0.065 respectively). Concerning the Comparative Fit Index (CFI) and Tucker Lewis Index (TLI), values above .90 are expected, with ideal values equal to or above .95. Satisfactory values were found in both the EFA and CFA (CFI = .925; TLI = .918 and CFI = .920; TLI = .914 respectively) (Hu & Bentler, 1999).

The Cronbach's α coefficient is commonly used to assess internal consistency. Values equal to or greater than .70 are deemed reliable by the Federal Council of Psychology (CFP, 2018). Based on the findings of this study, the EBRAPEG–A and its subscales also showed adequate reliability (Fearful α = .88; Secure α = .84; Preoccupied α = .89, and Dismissing α =.83). The factors maintained a structure similar to the RSQ scale: Secure, Preoccupied, and Fearful.

The difficulty in establishing a model different from the ECR scale (Hazan & Shaver, 1987) is well-documented in the literature. Finding these four similar factors in the EBRAPEG–A, inspired by Griffin and Bartholomew's Self and Other model (1994, RSQ), is an important finding. Psychometric studies for the RSQ scale with the same prototypical factors have limitations in corresponding to the original model, providing unsatisfactory results in various published studies

(Griffin & Bartholomew, 1994; Bäackström & Holmes, 2001; Guédeney, Fermanian, & Bifulco, 2010; Andersen et al., 2017).

The literature suggests that the challenge in finding an ideal fit for a theoretical model like this might be because attachment style scales with prototypical factors may reflect more than just one aspect of the attachment style per factor (Bäckström & Holmes, 2001; Collins, 1996; Feeney et al., 1994). Structuring the items in the EBRAPEG–A might represent progress for scales with theoretical models like this. Additionally, this study portrays the development of an originally Brazilian scale for adult attachment without the need for linguistic adaptations.

Final Considerations

Considering the study's potential and limitations, although it supports the identified factors, it suggests the potential use of alternative analysis techniques for assessing attachment styles in future studies. For example, employing analysis of variance for age and sex, along with a multidimensional cluster analysis method, could group subjects based on their characteristics. (Marôco, 2010). Furthermore, other sampling methods might be necessary, given that the largest contingent of participants was from the southeast region and self-declared as women, and additional socioeconomic variables such as family income were not included. Although the instrument is named the Brazilian Adult Attachment Scale because it was constructed in Brazil, subsequent studies need more representative samples of the Brazilian population.

In recent years, numerous studies have associated the importance of attachment in the field of mental health, both for clinical practice and research, due to its relation with certain psychopathologies such as depression, personality disorders, and low self-esteem (Varghese & Pistole, 2017; Barnum & Perrone, 2017; Özyurt et al., 2018; Moshkani & Afrooz 2018). These data could suggest the need for studies that assess the validity of the evidence for the instrument based on its relationship with other external variables.

Finally, it should be noted that during the parallel analysis, a fifth factor was retained. However, this was not maintained due to the cross-loading among the items. This fifth, psychometrically unstable factor may represent the intersection of loadings between items that correlate with the insecure attachment factors, as initially foreseen in the instrument's creation studies (Tartaro, 2021). Future versions might consider investigating a fifth factor by creating a distinct subscale independent of the overall scale. This new factor could align with an alternative theoretical model and potentially denote a more severe pattern of insecure attachment.

The creation of an instrument for measuring the construct in Brazil has been observed with skepticism by researchers, considering that the adaptation and validation of psychological instruments from other countries and cultures are complex procedures that not only entail the simple process of item translation, back-translation, and application. Poorly adapted instruments may present inconsistent or unreliable data, and even with methodological rigor, sometimes the items do not adequately reflect or fit the reality intended for their application, leading to the possibility of measurement errors (Borsa et al., 2012). Conversely, the instrument construction procedure allows the description of items to fit the native reality better.

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