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Original article

Psychometric Properties of the Mongolian Version of the Experiences in Close Relationships–Revised Child Version

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A B S T R A C T

In this study, we initially examined the psychometric properties of the Mongolian version of the Experiences in Close Relationships–Revised Child version (ECR-RC) based on 434 secondary school students' data. Of these, data from 427 participants were included in the validity analyses, and 374 participants completed a two-week retest. Reliability and construct validity were evaluated using internal consistency analysis, test–retest reliability, exploratory and confirmatory factor analyses, and indices of convergent and discriminant validity. The expected two-factor structure, comprising attachment anxiety and attachment avoidance, was generally supported. However, several items were removed during model refinement because of low factor loadings or problematic cross-loadings, resulting in a final 24-item model. 24-item model demonstrated acceptable fit for both the father form (RMSEA = 0.0475, SRMR = 0.0507, CFI = 0.932, TLI = 0.923) and the mother form (RMSEA = 0.0474, SRMR = 0.0499, CFI = 0.931, TLI = 0.921). Reliability was satisfactory across both parental contexts, with composite reliability values above 0.70 and two-week intra-class correlation coefficients for individual items ranging from 0.731 to 0.888. Discriminant validity was supported, whereas convergent validity received only partial support. Overall, the findings indicate that the Mongolian ECR-RC demonstrates good reliability and acceptable psychometric properties for assessing attachment-related anxiety and avoidance in children and adolescents; however, further validation using independent and more diverse samples is recommended.

1. INTRODUCTION

Attachment theory provides a significant theoretical lens through which the influence of children's formative relationships with caregivers on their subsequent socioemotional development and interpersonal functioning can be understood. From infancy onward, attachment reflects the innate tendency to form enduring emotional bonds with significant others and to rely on caregivers as a secure base for exploration and support (Ainsworth et al., 1978, p.260; Cassidy and Shaver,

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2008, p.131; Lionetti et al., 2018, p.452). The quality of these early relationships is influenced by the responsiveness, availability, and consistency of primary caregivers, and such experiences contribute to individual differences in attachment security and insecurity across development (Idrees et al., 2021, p.1540; Wongpakaran et al., 2021, p.1174).

The theoretical foundations of attachment were first articulated by John Bowlby, who emphasized the central role of early caregiver–child relationships in emotional development and later relational functioning (Cassidy et al., 2013, p.1415). This work was further advanced by Ainsworth and colleagues, whose research identified secure attachment and major forms of insecure attachment, including anxious/ambivalent and avoidant patterns. Since then, attachment has been widely recognized as an important factor in children's emotional regulation, social competence, and capacity to form close relationships later in life. Insecure attachment, in particular, has been associated with a range of socioemotional difficulties and may increase vulnerability to later emotional and behavioral problems (Bosmans et al., 2016, p.1135). For this reason, understanding attachment during childhood is highly relevant to both developmental and clinical research.

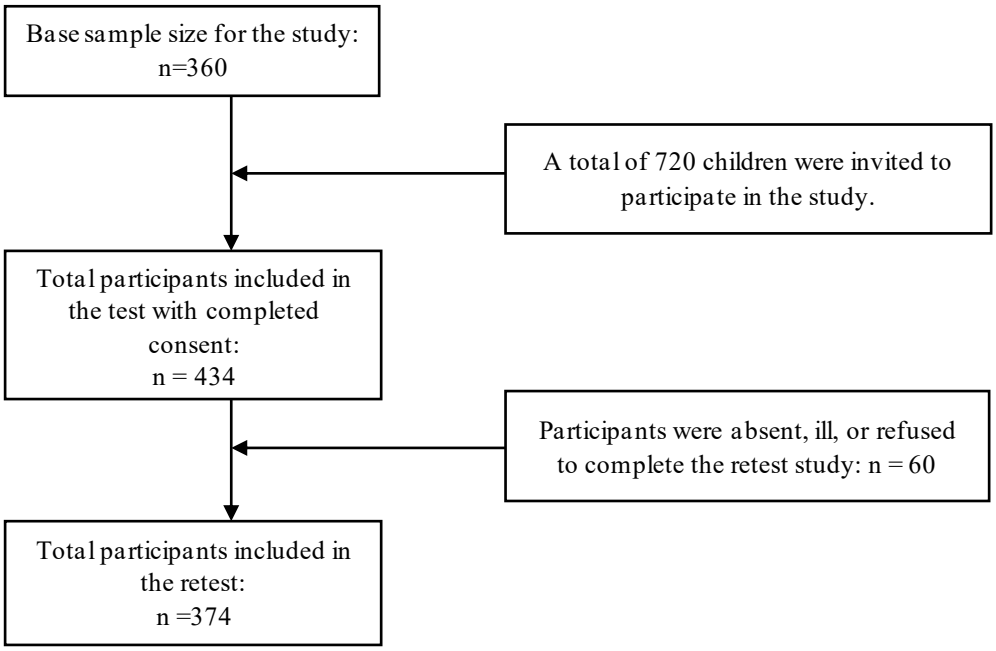
Given the importance of attachment for psychosocial development, reliable and culturally appropriate instruments are needed to assess attachment-related dimensions in children and adolescents. However, relatively few self-report measures have been developed specifically for use in middle childhood and early adolescence. One of the best known instruments for this age group is the Experiences in Close Relationships–Revised Child version (ECR-RC), which assesses the two core dimensions of attachment—anxiety and avoidance (Brenning et al., 2011, p.1048). Subsequent validation studies have supported the usefulness of the ECR-RC in different cultural settings, underscoring its value as a measure of attachment in younger populations (Marci et al., 2019, p.409; Pooravari et al., 2017, p.10).

Despite the growing international use of the ECR-RC, evidence regarding its applicability in Mongolia remains limited. Establishing the psychometric properties of the Mongolian version is therefore essential to determine whether the instrument is reliable and valid in this linguistic and cultural context. Accordingly, the present study aimed to examine the psychometric properties of the Mongolian version of the Experiences in Close Relationships–Revised Child version (ECR-RC) for use with children and adolescents.

2. MATERIALS AND METHOD

Study design and data collection

In this study, we evaluated the psychometric properties of the Mongolian version of the Experiences in Close Relationships–Revised Child version (ECR-RC). Following the general recommendation for psychometric studies, which includes at least 10 participants per item, the minimum required sample size was estimated at 360 participants (Kline, 2011, p.03). The target population comprised



of secondary school students in Mongolia.

Figure 1. Flowchart of study participants

The study consisted of two phases: a test phase and a retest phase. A total of 720 students were invited to participate. In the initial test phase, 434 students completed the questionnaire. Of these, 374 completed the retest within two weeks. The 60 students who did not participate in the retest were absent, ill, or declined to continue in the study (Figure 1).

Data collection: We collected data from secondary schools in Mongolia between February and March 2024. The questionnaire was administered in Mongolian using the Cyrillic script. All participants completed the paper-based ECR-RC in a school hall. To assess test–retest reliability, 374 participants completed the questionnaire again within two weeks of the initial administration. Prior to data collection, all data collectors were provided with standardized instructions on approaching participants, obtaining informed consent, explaining study procedures, registering participants, collecting questionnaires, and scoring and interpreting the results.

Measures: The Experiences in Close Relationships Scale (ECR) was originally developed by Brennan, Clark, and Shaver (1998, p. 46) to assess adult attachment along two dimensions: anxiety and avoidance. The revised version, the Experiences in Close Relationships–Revised (ECR-R), was later developed by Fraley, Waller, and Brennan (2000, p. 305) and has become one of the most widely used and well-validated self-report measures of attachment-related anxiety and avoidance. The child adaptation, the Experiences in Close Relationships–Revised Child version (ECR-RC), was developed for use with children and adolescents by Brenning et al (2011, p.1048). In this contribution, the ECR-RC was used to assess participants' attachment patterns. This written self-

report questionnaire is scored on a seven-point Likert scale and consists of two subscales: anxiety and avoidance. The anxiety subscale comprises 18 odd-numbered items, whereas the avoidance subscale comprises 18 even-numbered items.

Statistical analysis

We used Kolmogorov–Smirnov test to check data distribution normality. For continuous variables with normal distribution, descriptive statistics were summarized using means and standard deviations, whereas categorical variables were expressed as frequencies and percentages. Internal consistency of the ECR-RC was assessed using Cronbach's alpha coefficient. To examine external reliability, a test–retest procedure was conducted with a 14-day interval between the two administrations. Furthermore, we evaluated test–retest reliability using intraclass correlation coefficient (ICC) for the total scale and each subscale. ICC values of <0.50, 0.50–0.74, 0.75–0.89, and ≥0.90 were interpreted as indicating poor, moderate, good, and excellent reliability, respectively. Exploratory factor analysis (EFA) was conducted using principal component extraction with oblimin rotation. The suitability of the data for factor analysis was verified using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of Sphericity. KMO values greater than 0.50 and statistically significant Bartlett's test results ($p < 0.05$) were considered acceptable. Factors with eigenvalues greater than 1 were retained, and factor loadings >0.40 were considered satisfactory. Additionally, confirmatory factor analysis (CFA) was subsequently performed using IBM SPSS AMOS to further examine the factor structure of the scale. Model fit was evaluated using the comparative fit index (CFI), Tucker–Lewis index (TLI), and root mean square error of approximation (RMSEA), with values close to or above 0.90 for the CFI and TLI and close to or below 0.06 for the RMSEA indicating acceptable fit. During CFA, model refinement was guided by standardized factor loadings, modification indices, theoretical interpretability, and changes in AIC and BIC. Items with low standardized loadings (< 0.50) were considered for removal. Correlated residuals were added only when supported by both modification indices and substantive similarity in item content.

Ethics approval and consent to participate

The study protocol was reviewed and approved by the Ethics Board of the Mongolian National University of Education. Written informed consent was obtained from all participants and their parents or legal guardians prior to data collection.

3. RESULT

Validity

Exploratory factor analysis: Sampling adequacy and factorability were supported by the Kaiser–Meyer–Olkin (KMO) statistic and Bartlett's test of sphericity for both forms (Father: KMO = 0.925, $\chi^2(630) = 5813$, $P < 0.001$; Mother: KMO = 0.911, $\chi^2(630) = 5399$, $P < 0.001$), indicating that the correlation matrices were appropriate for factor analysis. Under the baseline solution, two factors with eigenvalues greater than 1 emerged, and items were retained when their factor loadings exceeded 0.35.

In the fundamental model, the two factors explained 31.4% and 32.6% of the total variance for the mother and father forms, respectively. For the 36-item fundamental model, the absolute fit indices were within acceptable ranges; however, the

incremental fit indices were suboptimal (Father: RMSEA = 0.0545 [0.0507, 0.0586], TLI = 0.836, BIC = -2116, $\chi^2(559) = 1270$, $P < 0.001$; Mother: RMSEA = 0.0584 [0.0546, 0.0624], TLI = 0.807, BIC = -2012, $\chi^2(559) = 1374$, $P < 0.001$).

Table 1. Exploratory factor analysis of the Mongolian version of ECR-RC

	EFA factor loading							
	Fundamental Model				**Model I**			
Items	**Father**		**Mother**		**Father**		**Mother**	
	Avoidance	Anxiety	Avoidance	Anxiety	Avoidance	Anxiety	Avoidance	Anxiety
Item 1		0.633		0.629		0.609		0.623
Item 3		0.611		0.544		0.607		0.555
Item 5		0.558		0.567		0.540		0.569
Item 7		0.550		0.607		0.556		0.601
Item 11		0.495		0.535		0.460		0.495
Item 13		0.615		0.576		0.618		0.572
Item 15		0.658		0.688		0.668		0.699
Item 19		0.398		0.407		0.398		0.389
Item 23		0.506		0.438		0.518		0.442
Item 25		0.458		0.450		0.473		0.459
Item 27		0.683		0.664		0.685		0.526
Item 29		0.601		0.563		0.582		0.526
Item 31		0.514		0.508		0.524		0.502
Item 33		0.432		0.495		0.426		0.478
Item 35		0.442		0.414		0.444		0.394
Item 2	0.376		0.448		0.379		0.457	
Item 4	0.483		0.470		0.482		0.473	
Item 8	0.535		0.508		0.510		0.493	
Item 16	0.451		0.513		0.456		0.514	
Item 18	0.464		0.506		0.463		0.499	
Item 20	0.660		0.705		0.660		0.704	
Item 22	0.767		0.795		0.763		0.797	
Item 24	0.725		0.672		0.730		0.675	
Item 26	0.761		0.671		0.767		0.678	
Item 30	0.549		0.603		0.557		0.603	
Item 32	0.483		0.501		0.487		0.498	
Item 34	0.629		0.606		0.631		0.609	
Item 36	0.731		0.707		0.733		0.706	
Item 9		NA		NA				
Item 17		NA		NA				
Item 21		NA		NA				
Item 6		0.417		0.422				
Item 10	0.369	0.376	0.306	0.389				

Item 12		0.311		0.351				
Item 14		NA		0.355				
Item 28		0.488		0.471				

Definition: An item is a singular question, prompt, or activity within a test or survey designed to assess a particular trait, ability, or construct.

Based on the fundamental model, items with low factor loadings (< 0.35) (Item 9, Item 17, and Item 21), items loading on non-target (cross) factors (Item 6, Item 12, Item 14, and Item 28), and items that did not meet the minimum difference criterion for cross-loadings (i.e., a difference of > 0.20 between primary and secondary loadings) (Item 10) were removed. An exploratory factor analysis was then conducted on the remaining 28 items to derive Model I (Table 1).

In contrast, marginal fit indices for Model I were acceptable, the incremental fit indices remained suboptimal (Father: RMSEA = 0.0548 [0.0497, 0.0602], TLI = 0.875, BIC = -1218, $\chi^2(323) = 738$, P< 0.001; Mother: RMSEA = 0.0592 [0.0542, 0.0645], TLI = 0.850, BIC = -1149, $\chi^2(323) = 808$, P < 0.001). Despite the overall fit not being fully satisfactory, Model I demonstrated improvement over the fundamental model, as indicated by the reduction in the BIC. Furthermore, Model I explained 34.8% and 35.8% of the total variance for the mother and father forms, respectively. Although the fit indices for Model I did not fully meet all recommended criteria, no further items were removed based solely on the EFA results. Instead, CFA was used to further test and confirm the structure of Model I.

Confirmatory factor analysis

We conducted CFA based on Model I, using the maximum likelihood estimation method. Measurement errors were specified as *e1* through *e28*, and standardized estimates greater than 0.50 were considered significant (to enhance clarity and interpretability, the results of the father version were emphasized and reported in detail in the manuscript).

The CFA results for Model I indicated that the covariance between anxiety and avoidance ranged from 0.479 to 0.515 (P < 0.01) for the mother and father forms. All items, except for Item 35, displayed standardized factor loadings greater than 0.50 (Figure 2).

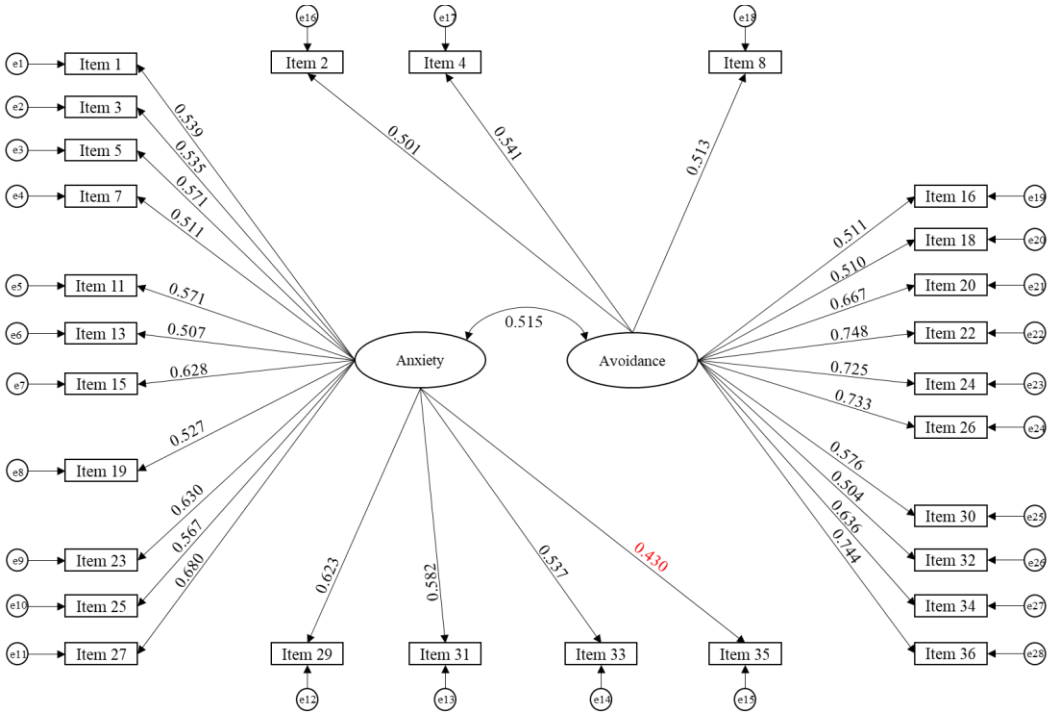


Figure 2. Confirmatory factor analysis of Model I (Father version)

Based on Model I, Item 35, which had a factor loading below 0.50, was removed. In addition, modification indices were examined, and residual covariances greater than 10 were freed on the basis of theoretical justification to improve model fit, resulting in Model II.

The fit indices for Model II, obtained by removing Item 35 and freeing theoretically justified residual covariances, indicated a fully acceptable model fit (Table 2).

Table 2. Model fit indices

Model	Version	RMSEA	SRMR	CFI	TLI	BIC	AIC
Model I	Father	0.0612	0.0634	0.861	0.850	48501	58156
	Mother	0.0633	0.0619	0.847	0.835	48790	48445
Model II	Father	0.0468	0.0551	0.927	0.917	46390	45997
	Mother	0.0448	0.0527	0.932	0.922	46620	46214
Model III	Father	0.0475	0.0507	0.932	0.923	41379	41047
	Mother	0.0474	0.0499	0.931	0.921	41562	41222

Abbreviations: RMSEA = Root mean square error of approximation, CFI = Comparative fit index, TLI = Tucker-Lewis index, BIC = Bayesian information criterion, AIC = Akaike information criterion

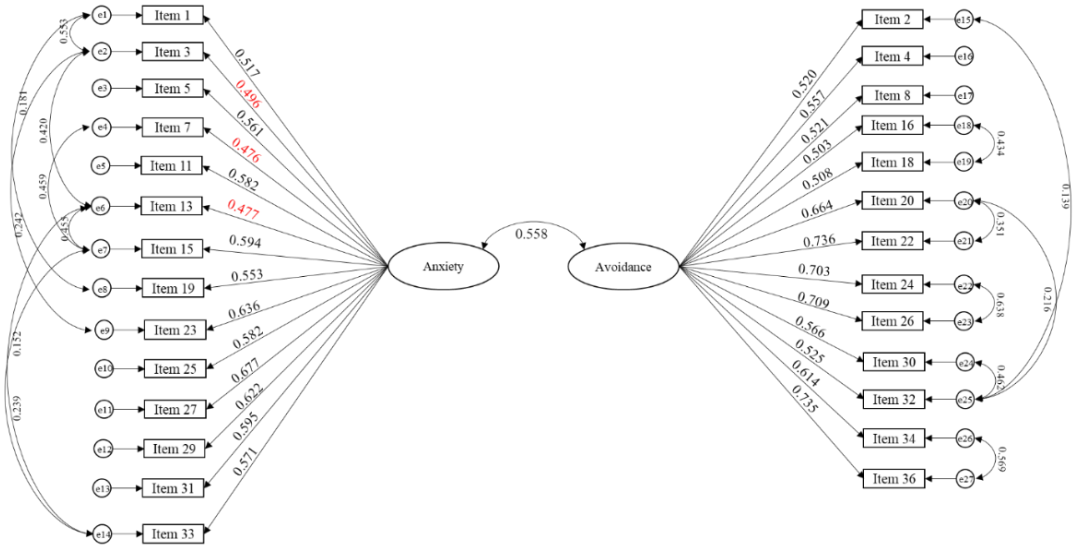


Figure 3. Confirmatory factor analysis of Model II (Father version)

Although the fit indices of Model II were fully within acceptable ranges, Item 3, Item 7, and Item 13 had factor loadings below 0.50. Therefore, these items were removed, and Model III was derived by additionally freeing theoretically justified residual covariances. The revised model was then re-evaluated using confirmatory factor analysis (Figure 3).

Model III, consisting of a total of 24 items (11 anxiety items and 13 avoidance items), was identified as the most optimal solution. The model demonstrated acceptable fit measures for both the father and mother versions. In addition, among the models, the Model III showed that the best fitted values (Figure 4).

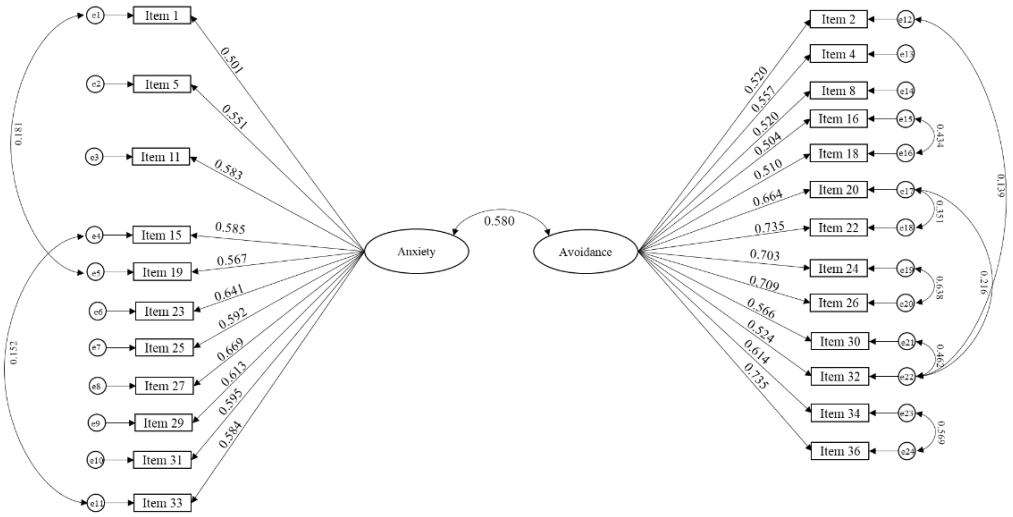


Figure 4. Confirmatory factor analysis of Model III (Father version)

Convergent and discriminant validity

The convergent and discriminant validity of the 24-item instrument were evaluated using Composite Reliability (CR), Average Variance Extracted (AVE), and the Heterotrait–Monotrait ratio (HTMT).

Table 3. Convergent and discriminant validity results

Factor	CR	AVE	HTMT	
			Anxiety	Avoidance
Model III - father				
Anxiety	0.854	0.351	-	
Avoidance	0.884	0.385	0.587	-
Model III - mother				
Anxiety	0.927	0.332	-	
Avoidance	0.916	0.376	0.530	-

Abbreviations: CR = Composite reliability, AVE = Average variance extracted, HTMT = Heterotrait-Monotrait ratio

Convergent validity was partially supported, whereas discriminant validity was fully supported (Table 3). Each item measured its latent variable consistently (CR > 0.7), but each latent variable explained only a small proportion of the mean variance in its corresponding items (AVE < 0.5). However, the Heterotrait-Monotrait ratio provided evidence that the two latent variables were distinct (HTMT < 0.85).

Reliability

The reliability of the instrument was assessed using the test-retest method. Retesting was performed 14 days after the initial assessment, and reliability was evaluated using intraclass correlation coefficients based on data from 374 individuals who completed both assessments. Internal consistency was tested on the 24-item model III version, and each factor was at an acceptable level (Cronbach's α: Anxiety 0.848-0.857, Avoidance 0.822-0.830, McDonald's ω: Anxiety 0.858-0.848, Avoidance 0.851-0.854). Test-retest reliability was > 0.7 for each item (Table 4).

4. DISCUSSION

This study examined the psychometric properties of the Mongolian version of the ECR-RC in a sample of Mongolian secondary school students. Overall, the findings provide evidence for the reliability of the instrument and for several key aspects of its construct validity, suggesting that the Mongolian ECR-RC may serve as a useful measure of attachment-related anxiety and avoidance in children and adolescents.

The factor-analytic findings generally supported the expected two-factor structure of the scale, corresponding to attachment anxiety and attachment avoidance. In the

exploratory factor analysis, most items loaded in the expected direction, supporting the internal structure of the questionnaire. However, several items demonstrated weak loadings or problematic cross-loadings, indicating that not all items functioned optimally in the Mongolian context. Through iterative model refinement, a 24-item solution was identified as the optimal final model. This refined version showed acceptable fit across both the father and mother forms and demonstrated better overall psychometric performance than the earlier 36-item and 28-item solutions. The removal of multiple items may reflect linguistic, cultural, or contextual factors influencing how attachment-related experiences are interpreted by Mongolian children and adolescents. Culturally specific norms regarding parental authority, emotional expression, and interpersonal closeness may shape responses to certain items, especially those originally developed in Western contexts. The need for item reduction highlights the importance of empirically evaluating item functioning during cross-cultural adaptation rather than assuming full equivalence with the original measure (Ambuehl and Inauen, 2022, p.12775; Lansford and Edu, 2025, p. 851; Zhao et al., 2024, p.04151).

The reliability findings were satisfactory across both parental contexts. Internal consistency was supported by acceptable Cronbach's alpha and McDonald's omega coefficients, while test–retest reliability over a two-week interval indicated good temporal stability. Collectively, these findings indicate that the Mongolian ECR-RC yields consistent scores across repeated administrations and appears suitable for use in research involving children and adolescents.

Additional evidence for construct validity was provided by the discriminant validity analysis, which showed that attachment anxiety and attachment avoidance were empirically distinguishable dimensions. Although convergent validity received only partial support, this pattern is not uncommon in scale adaptation studies and may reflect differences in the cultural meaning or expression of attachment-related behaviors. This pattern suggests that, while the overarching structure of attachment insecurity is preserved, certain aspects of the constructs may manifest differently in the Mongolian cultural setting, warranting further item-level refinement and investigation.

The present findings align with previous validation studies conducted in other non-Western and Western contexts, which have generally supported a two-dimensional structure of attachment insecurity in childhood and adolescence (e.g., Pooravari and Ashtiani, 2017, p.5; Skoczeń et al., 2019, p.488; Vu et al., 2022, p.846).

Table 4. Internal consistency and test-retest reliability of the Mongolian version of ECR-RC (n=374)

Items	FATHER	MOTHER								
	Mean	SD	Cronbach's α	McDonald's ω	ICC	Mean	SD	Cronbach's α	McDonald's ω	ICC
ANXIETY										
Item 1	2.69	2.03	0.851	0.851	0.823	2.59	2.08	0.839	0.840	0.842
Item 5	2.53	2.00	0.848	0.848	0.817	2.44	2.00	0.839	0.840	0.795
Item 11	3.00	2.16	0.846	0.847	0.792	2.75	2.13	0.835	0.836	0.831
Item 15	2.49	2.06	0.847	0.847	0.841	2.38	2.00	0.834	0.835	0.824
Item 19	2.81	2.14	0.846	0.846	0.810	2.76	2.16	0.837	0.837	0.811
Item 23	3.19	2.31	0.843	0.843	0.857	2.89	2.20	0.835	0.836	0.817
Item 25	2.54	2.11	0.845	0.846	0.817	2.47	2.07	0.835	0.836	0.838
Item 27	2.70	2.15	0.838	0.839	0.824	2.57	2.08	0.828	0.828	0.816
Item 29	2.86	2.25	0.844	0.845	0.816	2.68	2.11	0.832	0.833	0.810
Item 31	2.69	2.09	0.843	0.844	0.828	2.75	2.11	0.833	0.834	0.763
Item 33	3.21	2.33	0.846	0.846	0.824	3.14	2.30	0.836	0.836	0.787
Anxiety	**2.79**	**1.38**	**0.857**	**0.858**		**2.67**	**1.33**	**0.848**	**0.848**	
AVOIDANCE										
Item 2	3.69	2.16	0.879	0.880	0.792	3.36	2.24	0.877	0.880	0.794
Item 4	4.43	2.14	0.821	0.848	0.730	4.58	2.27	0.814	0.847	0.796
Item 8	5.28	2.12	0.820	0.847	0.811	5.30	2.15	0.810	0.845	0.813
Item 16	5.51	2.02	0.820	0.847	0.801	5.43	2.09	0.805	0.840	0.808
Item 18	5.55	1.98	0.818	0.845	0.813	5.35	2.20	0.807	0.842	0.783
Item 20	4.13	2.35	0.810	0.839	0.824	4.79	2.24	0.799	0.834	0.818
Item 22	4.80	2.21	0.802	0.831	0.751	5.18	2.09	0.791	0.826	0.827
Item 24	3.89	2.28	0.806	0.834	0.831	4.22	2.29	0.802	0.837	0.841
Item 26	4.29	2.30	0.806	0.834	0.832	4.45	2.30	0.798	0.833	0.863
Item 30	5.64	1.95	0.813	0.840	0.792	5.66	2.00	0.800	0.834	0.826
Item 32	5.94	1.74	0.815	0.842	0.853	5.86	1.89	0.806	0.840	0.850
Item 34	5.05	2.16	0.808	0.836	0.831	5.22	2.13	0.800	0.835	0.877
Item 36	5.08	2.18	0.801	0.829	0.888	5.21	2.15	0.794	0.829	0.852
Avoidance	**4.87**	**1.22**	**0.830**	**0.854**		**4.97**	**1.22**	**0.822**	**0.851**	

Abbreviations: SD = standard deviation, ICC = intraclass correlation coefficient

At the same time, the current study extends the existing literature by providing empirical evidence for the applicability of the ECR-RC within a Mongolian cultural context, thereby contributing to the limited body of research on attachment assessment in Central Asian populations.

Several limitations should be acknowledged. Firstly, the sample was restricted to secondary school students recruited from a non-clinical population, which may limit the generalizability of the findings to younger children or clinical groups. Secondly, the reliance on self-report measures introduces the possibility of response biases. Finally, although factorial validity was supported, additional analyses—such as tests of measurement invariance across age and gender—were beyond the scope of the present study. Future research should address these limitations by examining the Mongolian ECR-RC in more diverse and independent samples, including clinical populations, and by further refining items that demonstrated suboptimal performance.

Conclusion : The findings of this study indicate that the Mongolian version of the Experiences in Close Relationships–Revised Child version demonstrates satisfactory psychometric properties in a sample of Mongolian children and adolescents. The final 24-item model demonstrated acceptable factorial validity, satisfactory internal consistency, good test–retest reliability, and evidence of discriminant validity across both the father and mother forms. Although convergent validity was only partially supported and several items required removal during model refinement, the overall findings suggest that the Mongolian ECR-RC is a reliable and psychometrically acceptable instrument for assessing attachment-related anxiety and avoidance. This scale may be useful in future developmental, educational, and clinical research in Mongolia, particularly in studies examining children's socioemotional functioning and relationships with caregivers. Nevertheless, further validation studies using independent and more diverse samples are recommended to strengthen the generalizability and robustness of these findings.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTION

Bayarmaa Tsend and **Enkhmanlai Batsukh** conceived and designed the study**; Nominzul Nasanbat** and **Buyanzaya Marsgerel** collected the data; **Naidan Bat-Ulzii, Buyanzaya Marsgerel**, and **Uranbile Sainbat** analysed the data; **Bayarmaa Tsend, Naidan Bat-Ulzii** and **Nominzul Nasanbat** drafted and revised manuscript. All authors reviewed and approved the final version of the manuscript.

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