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Assessing the Psychometric Properties of Hindi Version of Relationship Structure (ECR-RS) Scale among Young Adults

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ABSTRACT

Relationship science has proliferated in the last few years. However, most of these studies have remained focused on western culture. An important reason for the lack of relationship studies in the non-western, particularly Indian context, is the lack of culturally validated scales. The present study was aimed at assessing the psychometric properties of the relationship structure (ECR-RS) scale. ECR-RS is a nine-item questionnaire used to measure attachment patterns for different relationships. It has been translated and modified in multiple languages. The study (N = 223, undergraduate students, 32.7% females) evaluated the Hindi version of ECR-RS scale's psychometric properties for mother, father, close friend, and global attachment. The confirmatory factor analysis supports the presence of the two-factor model as originally theorized in ECR-RS. The findings support the reliability and validity of Hindi ECR-RS. The study contributes methodologically by providing an instrument of attachment styles, which could be a valuable resource for practitioners and researchers in the Indian context.

1. Introduction

Relationship science has proliferated in the last few years [1]. However, a significant limitation of relationship studies is that they have remained focused on the WEIRD (western, educated, industrialized, rich, and democratic) sample [2]. At the same time, the institutions of primary human relationships, i.e., marriage and family, are undergoing intense changes throughout the world. In India, for instance, the large joint-family households are transforming to nuclear couple-centric households [3], the intimate relationship of spouses are changing with increased educational status and participation of women in the workforce, the divorce rates are gradually increasing, particularly in urban regions [4], and alternate family systems are getting visibility particularly after the decriminalization of section 377 by the supreme court of India, providing relief to the LGBTQA community.

These cultural shifts demand exploration of relationship processes in non-western contexts. Lack of relationship studies from non-western cultures limits our understanding of relationship functioning in these cultures. An important reason for this gap in the literature, especially in the Indian context, is the absence of culturally validated scales and questionnaires which hinders research and practice.

Although many theories exist to understand relationship dynamics [5], attachment theory is probably the most popular among relationship scientists. It is one of the most extensively researched psychological theories in relationship studies [6]. The development of self-report

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questionnaires to measure attachment patterns was an important reason that accelerated attachment-related research. Various self-rating scales have emerged to measure attachment behaviors. Ravitz et al. [7] have reviewed 29 self-rating scales of attachment. The self-rating approach to measure attachment styles has gradually shifted the conceptualization of attachment from a categorical concept to a two-dimensional construct.

The items used by Hazan and Shaver [8] grouped attachment patterns into three categories, i.e., secure, anxious/ambivalent, and avoidant. However, discrepancies in the definition of avoidant attachment led Bartholomew [9] to group attachment into four categories - secure, preoccupied, fearful, and dismissing [10]. Fraley and Waller [11], with the help of MAMBAC (Mean above Minus below a Cut) and MAXCOV (Maximum Covariance-Hitmax) analyses, argued that attachment is more of a dimensional construct than a categorical one. Thus the four-category model of attachment evolved into a two-dimensional construct - attachment-related anxiety and attachment-related avoidance, in the Experiences in close relationships (ECR) [12] and Experiences in close relationships - revised (ECR-R) [13].

Researchers and practitioners have extensively used both ECR and ECR-R in various studies. However, there are few limitations to these well-researched attachment scales. Both ECR and ECR-R are large-item questionnaires consisting of 36 items used to measure anxiety and avoidance. The presence of many items makes these scales cumbersome. Moreover, several items in these scales are redundant and repetitive [14].

Recently, Fraley et al. [15] have developed a shorter scale called the Relationship structure (ECR-RS) scale. ECR-RS is a nine-item questionnaire where six items measure avoidance and three items measure anxiety on a 7 point Likert scale[1]. Four of the six items of the avoidance dimension are reverse coded. This questionnaire is separately used to measure attachment in different relationships, such as attachment with mother, father, partner, and close friend. A composite score is expected to reflect the individual's global attachment style. ECR-RS has shown adequate reliability and validity with a Cronbach's alpha score greater than .80 for both anxiety and avoidance for different relationships. This scale has been translated into multiple languages, including Danish [16], Portuguese [17], French [18], Chinese [19], Swedish [20], and Turkish [21]. An advantage of ECR-RS over ECR and ECR-R is the fewer items which makes it feasible for

different kinds of studies.

The present study aimed to develop and assess the psychometric properties of the Hindi ECR-RS scale. Hindi is one of the most popular languages of communication in India. The availability of the Hindi ECR-RS will be beneficial for therapy and research processes.

2. Methods

2.1 Translation of ECR-RS into Hindi

We began by translating the items of ECR-RS into Hindi. Two forward and one backward translation were done with the help of volunteers who had university-level education and were fluent in English and Hindi. We selected translations with comprehensible items. These were pilot tested on a small sample of thirty individuals to ensure that items were culturally meaningful. We made minor changes based on the suggestions of participants in the pilot study. We then used the final version of ECR-RS for mother, father, and close friend for the data collection.

2.2 Sample

The data were collected from 223 participants (73 females and 150 males) living in different parts of northern India. The sample size was decided based on the requirement for conducting confirmatory factor analysis. Meyers et al. [22] suggest the sample size of 200 as a minimum requirement for conducting factor analysis (p. 468). The Institutional Review Board, Indian Institute of Technology Roorkee, provided ethical approval for data collection. The participants were undergraduate college students whose ages ranged from 16 to 21 years (M= 18.27, SD = 1.148). Seventy-nine participants (35.4%) came from rural areas, while 144 (64.6%) came from urban areas. Altogether, 172 (77.1%) participants lived in nuclear families, whereas 51 (22.9%) lived in joint family households.

2.3 Procedure

The data were collected through online mode. Undergraduate students of the Indian Institute of Technology Roorkee and Salesian College, Siliguri from north India, were provided with the links for the questionnaire. Participants were briefed about the study and were informed that participation was voluntary. We provided no incentive for participation in the study. The participants had the choice to drop out of the study at any point during the data collection process. To ensure anonymity, we did not collect any information that could identify individual participants. When participants agreed, they

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1 For Hindi version of ECR-RS please contact the corresponding author at kumar.riteshmehta@gmail.com

were provided with the link to the questionnaire. It took approximately 15 minutes to complete the questionnaire.

The instruction provided to the participants for ECR-RS for attachment with mother read, "The following statements are about your thoughts and opinions for your relationship with your mother. Please read the statements and choose the appropriate option to indicate how much you agree or disagree with these statements." We provided similar instructions for ECR-RS for other relational domains. In these questionnaires, the word mother was replaced by "father" and "close friend." All items were measured on a 7 point Likert scale with 1 as "strongly disagree" and 7 as "strongly agree."

3. Results

The data analysis was carried out in SPSS (v. 20) and Amos (v. 20). No missing values were present. We carried out both exploratory and confirmatory factor analysis (EFA and CFA) for each relationship, i.e., mother, father, close friend, and global attachment. The scores of global attachment were derived by averaging the scores for mother, father, and close friend. The factor loadings derived from exploratory factor analysis are presented in Table 1.

EFA was conducted using principal axis factoring and varimax rotation in SPSS. The KMO and Bartlett's test of sphericity for each relationship indicated that factor analysis was meaningful. In EFA for attachment with

mother, two factors emerged, explaining 43.91% variance. For attachment with father also two factors emerged in EFA explaining 55.96% variance. For attachment with close friends, however, a three-factor solution emerged, explaining 66.84% variance. The 5th and 6th items of the avoidance dimension formed a separate factor with an Eigenvalue of 1.07. Both of these items of avoidance dimension are reverse coded, indicating issues with item wordings. We forced the extraction of two factors. This resulted in a two-dimensional model with items of avoidance loading on the first factor and the items of anxiety loading on the second factor, explaining 57.33% variance. Finally, the EFA of global attachment extracted two dimensions explaining 55.97% variance.

We also carried out CFA to confirm that the model was correct. The model fit indices are presented in Table 2. The fit indices for attachment with mother was within acceptable range (CFI = 0.93, RMSEA = 0.07). However, the model fit indices for attachment with father, close friend, and global attachment lacked adequate fit. For these three models, the RMSEA value was greater than 0.1. We modified these three models by drawing co-variances between error terms for items 1 and 4 and items 5 and 6. These modifications led to substantial improvement in the model fit indices (for father CFI = 0.97, RMSEA = 0.06; for close friend CFI = 0.96, RMSEA = 0.08; for global attachment CFI = 0.96, RMSEA = 0.08).

Table 1. The factor loadings of each item of ECR-RS derived from exploratory factor analysis

Items	Mother Avoidance	Anxiety	Father Avoidance	Anxiety	Close Friend Avoidance	Anxiety	Global Attachment Avoidance	Anxiety
1	**0.61**	0.08	**0.64**	0.18	**0.74**	0.25	**0.66**	0.13
2	**0.89**	-0.07	**0.91**	0.01	**0.89**	0.13	**0.91**	-0.01
3	**0.91**	-0.11	**0.88**	0.07	**0.86**	0.11	**0.92**	0.01
4	**0.51**	0.17	**0.63**	0.24	**0.63**	0.21	**0.56**	0.19
5	**0.54**	0.12	**0.54**	0.19	**0.31**	0.26	**0.50**	0.29
6	**0.57**	0.20	**0.56**	0.14	**0.40**	0.32	**0.51**	0.29
7	0.14	**0.55**	0.22	**0.84**	0.25	**0.77**	0.19	**0.76**
8	0.01	**0.50**	0.10	**0.67**	0.19	**0.72**	0.07	**0.69**
9	0.06	**0.67**	0.14	**0.76**	0.11	**0.90**	0.13	**0.83**

Notes: Loadings greater than 0.4 are in bold. Items 1 to 6 belonged to avoidance dimension, and items 7 to 9 belong to anxiety dimension. Hindi ECR-RS items are provided in the appendix.

Table 2. The confirmatory factor analysis model fit indices for different measures

Models	χ^2	df	χ^2/(df)	GFI	TLI	CFI	RMSEA
ECR-RS Mother	56.54	26	2.27	0.94	0.93	0.95	0.07
ECR-RS Father	113.14	26	4.23	0.89	0.87	0.90	0.12
ECR-RS Father Modified	44.21	24	1.84	0.95	0.96	0.97	0.06
ECR-RS Friend	110.01	26	4.23	0.90	0.88	0.91	0.12
ECR-RS Friend Modified	62.87	24	2.62	0.94	0.94	0.96	0.08
ECR-RS Global attachment	126.05	26	4.84	0.88	0.85	0.89	0.13
ECR-RS Global attachment Modified	63.10	24	2.62	0.94	0.94	0.96	0.08

Notes: All models consisted of 9 items. In modified models, co-variances were drawn between error terms for items 1&4 and items 5 & 6.

Reliability and validity statistics

Table 3 presents the reliability and validity properties of ECR-RS for different relationships. It is evident from the table that for all the dimensions of ECR-RS for attachment with different relationships, Cronbach's alpha score was adequate (> 0.80) except for anxious attachment with mother (α = 0.59). The average variance extracted (AVE) is popularly used to interpret the convergent validity. The AVE score for the avoidance dimension was slightly lower than 0.5. Again, except for the mother's anxious attachment, the AVE score for anxiety dimension for all other relationships was within the acceptable range (> 0.5). Because of the low reliability and convergent validity of anxiety with the mother, we assessed the descriptive statistics and inter-item correlation of the three items of this dimension (see Table 4). The findings indicated that the scores of anxiety with mother were skewed, kurtotic, and had low inter-item correlation (> 0.4).

Table 3. The reliability and validity scores

ECR-RS measures	Cronbach's α	AVE	HTMT
Mother - Avoidance	**0.81**	0.46	
Mother - Anxiety	0.59	0.33	**0.22**
Father - Avoidance	**0.85**	0.50	
Father - Anxiety	**0.81**	0.61	0.39
Friend - Avoidance	**0.82**	0.48	
Friend - Anxiety	**0.86**	0.68	0.52
Global avoidance attachment	**0.84**	0.49	
Global anxious attachment	**0.81**	0.78	0.38

Note: AVE = Average variance extracted, HTMT = Hetro-trait mono-trait test of correlation; Scores in bold suggest acceptable reliability and validity scores
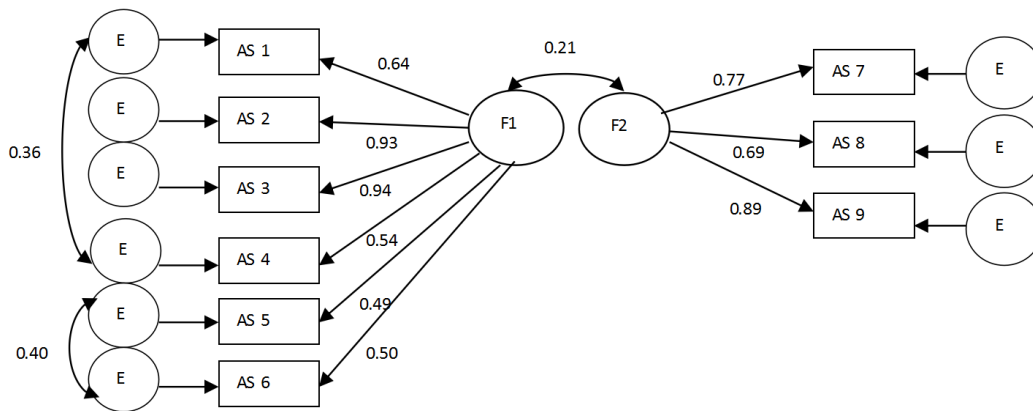

Figure 1. Factor loadings for global attachment, F1 = Avoidant attachment; F2 = Anxious attachment

Table 4. Showing the summary of Correlations, Means, Standard deviations, Skewness, and Kurtosis of ECR-RS with each relationship

Variable	Avoidance				Anxiety			
	Mother	Father	Friend	Global	Mother	Father	Friend	Global
Avoidance								
Mother								
Father	.47							
Friend	.16	.07						
Global	.77	.76	.56					
Anxiety								
Mother	.16	.04	.12	.15				
Father	.04	.33	.05	.21	.52			
Friend	.07	.08	.45	.28	.12	.12		
Global	.11	.21	.37	.33	.60	.67	.77	
M	2.89	3.37	2.78	3.01	1.33	1.55	2.87	1.92
SD	1.28	1.46	1.28	0.94	0.72	1.08	1.69	0.82
Skewness	0.95	0.50	0.57	0.43	2.59	2.37	0.64	0.89
Kurtosis	0.82	-0.37	-0.14	0.25	6.52	5.42	-0.50	0.35

Note: M is the mean for an average of avoidance and anxiety dimensions for different relationships; *SD* is the standard deviation

We used the hetero-trait mono-trait ratio of correlations (HTMT) method to test the discriminant validity. Henseler et al. [23] suggest that the HTMT method is a better indicator of discriminant validity than traditional methods such as examining cross-loadings. The HTMT value is recommended to be below 0.85 to establish discriminant validity. The HTMT value of ECR-RS for all relationships, including the composite score for global attachment, was acceptable (< 0.85). Thus the discriminant validity was supported.

4. Discussion

The purpose of the current work was to assess the psychometric properties of the Hindi ECR-RS scale. A similar and consistent pattern appeared for ECR-RS for each of the relationships, i.e., mother, father, friend, and global attachment. A two-dimensional structure was supported in the confirmatory factor analysis, corresponding to the model proposed by Fraley et al. [15]. Items on the first factor belonged to avoidance dimension, and items on the second factor belonged to the anxiety dimension. Item 5 and item 6 had the lowest factor loadings on avoidance dimension for all the relationships. Item wordings likely had a role to play in this. The first four items of ECR-RS are reverse coded, but item 5 and item 6 are not. Jaiswal identified problem with item wordings in the Hindi version of experiences in close relationship - revised (ECR-R) scale [24]. It is likely that in the Hindi language, although the implicit meaning of the items may be similar yet because of different wordings, they are rated differently.

The reliability scores for Hindi ECR-RS indicated the scale was reliable, except for the anxiety dimension of ECR-RS for the mother. The anxiety dimension of ECR-RS for mother also showed low convergent validity. One reason for this finding for anxiety with mother could be the cultural meaning and emphasis associated with the mother-child relationship. Kakar [25] and Roland [26] have emphasized that in Indian culture, the relationship with the mother is considered reverent. The mother-child relationship is socially valued as it alleviates the social status of women in the larger joint family and society. It is also argued that the separation-individuation process with attachment figures, particularly with mother, is never fully accomplished. These cultural values associated with the relationship with mother could be a reason for the lack of variance and high skewness and kurtosis of data for this dimension. Additionally, the fewer items could also have influenced the reliability and validity of anxiety with mother. Fraley et al. [15] have pointed out that the anxiety dimension does not contain any item which is reverse

coded. Thus social desirability can influence the scores of anxiety. Findings suggest that items for anxiety need modification to measure anxious attachment with mother adequately.

4.1 Implications

The present study has both theoretical and applied implications. The study contributes theoretically by providing cross-cultural support for the ECR-RS scale's applicability in the Indian context, particularly for the Hindi-speaking population. It also supports the relevance of the adult attachment model [27] in a non-western context, thus, providing cross-cultural support to the tenets of the adult attachment model. ECR-RS can be a valuable resource for both practitioners and academicians alike. The study also has applied implications. The family and couple counselors will benefit from the availability of the Hindi version of ECR-RS, especially those in the understaffed family courts in several states of India. The availability of culturally validated instruments opens new avenues for testing and extending attachment theory propositions in the Indian context.

4.2 Limitations

There are some limitations to the present study. For instance, although the sample size was moderate, a larger sample would have provided a more accurate picture of the population scores. Also, the sample mostly comprised of late teenagers and young adults. A sample consisting of diverse participants would provide richer information about Hindi ECR-RS's performance in the Indian context. Secondly, using other measurement tools to assess the convergent and discriminant validity would have provided a more comprehensive understanding of ECR-RS's internal consistency and discriminant validity. Moreover, although ECR-RS is supposed to improve ECR and ECR-R because of fewer items and the ability to measure various relational domains, it measures only the insecure attachment but not the secure attachment.

The future direction would be to test Hindi ECR-RS further using test-retest reliability and the convergent validity using other attachment scales such as Experiences in close relationships. Researchers can also use item response theory to test how each item performs. Future studies can also include items to measure secure attachment and thus overcome an important limitation of attachment questionnaires. The present study had moderate sample size. Future studies can use a larger sample to provide an accurate representation of population scores. We also recommend modifying and adding items

for anxiety dimension to measure attachment-related anxiety accurately.

5. Conclusions

Overall, the present study provides promising results for the Hindi ECR-RS scale and suggests further extension of work. Hindi ECR-RS performed relatively well on the internal consistency, reliability, and validity tests. The future studies can modify the ECR-RS items that had lower loadings on the anxiety and avoidance dimensions and test the influence of item wordings. One could test the performance of Hindi ECR-RS by re-organizing reverse worded items of avoidance dimension into similarly worded items. In conclusion, it is argued that Hindi ECR-RS can be meaningfully used to measure attachment patterns in the Indian context. It will be beneficial in extending research on various relationship domains in Indian culture.

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