

Standardization of Mother Attachment Inventory in Indian Context for Senior Secondary Students: Psychometric Approach

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Abstract

Aim and Objectives of present study: To standardize the Maternal Attachment Inventory (MAI) which is derived from the Inventory of Parent and Peer Attachment Inventory, in Indian context; to report the reliability scores in form of Cronbach's Alpha; and to test its psychometric properties in a sample comprising of 250 students (including both boys and girls) studying in class XI of co-ed schools of Delhi.

Background of present study: Though there are several studies which report the use of IPPA towards understanding the role of parental and peer attachment among adolescents and emerging adults, however there is strong dearth felt for standardization and psychometric report availability towards individual inventories within the IPPA. Moreover, this is one among a few studies which focus on cultural standardization of the tool within Indian context.

Research Design followed for present study: cultural validation and standardization of research tools using structural equation modeling. Factor structure was developed for the tool using EFA. This was followed by CFA which helped to determine and confirm the factors extracted.

Research Method: Data was collected between November 2022 and March 2023. In stage I the data collected with the help of the research instrument was cleaned and exported onto a user-friendly statistical database (SPSS version 23.0). In stage II the factor structure was tested on participants comprising of senior secondary school students studying in class XI of identified co-ed schools functioning in morning session within Delhi-NCR. Stage-III involved confirmation of factors emerged from the study.

Findings: A four-factor structure with eighteen items emerged namely Trust, Communication and Alienation, which is in alignment with the original scale IPPA. The Indian version is reliable and valid for assessing maternal attachment in adolescents up to 17 years of age.

Conclusion: The psychometric testing revealed that the dimensions of the present scale were adequate for measuring attachment relationships between Indian mothers and adolescents in cultural-friendly manner. This study also recommends the use of such tools to measure social connections and attachment relationships. Hence, this can have far -reaching consequences in prevention and management of relationship issues among emerging adults.

Keywords: Cultural friendly, Factor extraction, Maternal attachment, Structural Equation Modelling, Scale validation

Mother attachment is the deep-emotional, lasting bond formed between a mother, who acts as the primary caregiver, and the child (Kinsey & Hupcey, 2013). It is a complex and multifaceted relationship which forms in the womb during conception stage (maternal antenatal attachment) and continues till grave (Rossen et al, 2016; DeCock et al., 2016; Dubber, Reck, Muller & Gawlik, 2015). Mother attachment is essential for supporting the physical, mental, social, and emotional well-being of a young child, especially during childhood and adolescent stages. The display of attachment relationships. The quality and nature of maternal attachment is found to have a long- lasting and critical impact on child development (Nordahl et.al., 2020; Mason, Briggs & Silver, 2011).

Attachment Theory is applicable to all humans and is viewed as the central focus in formation of attachment relationships with caregivers in response to seek formation of emotional bonds by the infant or child for obtaining a sense of security and affection (Bowlby, 1988). There are three major types of attachment relationships namely: secure, insecure-avoidant, and insecure-ambivalent styles.

Tool standardization is the systematic and scientific process of ensuring that a research tool is reliable and valid. This indicates that the tool is functioning effectively and is measuring what it intended to measure. Importance of tool standardization can be understood as follows:

- To ensure increase in effectiveness of the research tool.
- To ensure reliability and validity of the tool
- To improve the quality of research by promoting use of accurate and scientifically developed tools
- To allow ease in comparison of different tools and their findings
- To ensure that the results of research are reliable and valid.
- To make it easier to compare the results of different studies.
- To allow researchers to build on the work of others.

These aid in improving the quality of research.

AIM OF THE STUDY

There is a pressing need to develop and standardize self-report scales designed for measuring attachment relationships and diagnosing its types to allow researchers to test causal hypothesis in research studies aimed at exploring and understanding attachment relationships, its mediating and predictive factors (Shaver & Mikulincer, 2010). The current study is designed to conduct the structural and cultural validation of mother attachment inventory in the Indian context, derived from Inventory on Parent and Peer Attachment (IPPA) using factor analysis and structural modelling. The proposed tool will then be used to analyze the nature of maternal attachment relationships among senior secondary school students studying in Co-ed senior secondary schools of Delhi.

RESEARCH DESIGN

The present study can be divided into three stages which are describes as follows:

Stages-I	<ul style="list-style-type: none"> • Date collection and cleaning • Data coding and importing to user friendly database (SPSS)
Stage-II	<ul style="list-style-type: none"> • Exploring the Factor structure and removing redundant items using EFA • Calculation of factor loadings of all items • Categorization of the items within factors
Stage-III	<ul style="list-style-type: none"> • Confirmation of factors emerged using CFA

Description of tools used in the study

The tool used for the present study was derived from the IPPA and named the Mother Attachment Inventory (MAI). It was further divided into 2 sections: section-1 contained questions on demographic attributes of the respondent such as name, class of study, name of school, age (in years), number of siblings, location/area of habitation, type of family and annual income of parents. Sectio-2 focused on the 25 items meant to assess the mother-adolescent attachment relationship and its classification into the proper type.

About IPPA

The Inventory on Parent and Peer Attachment (IPPA) (Armsden & Greenberg, 1987) is a self-report questionnaire containing 3 sub scales. The 1st and 2nd subscales involve items on parental attachment (mother and father) and the 3rd sub-scale has items which measure attachment with peers. The mother attachment sub-scale contains 25 items which are scored on a seven-point Likert scale ranging from 1= never true, till 7 = always true. The nature of the score obtained after totaling for all given items indicates the type of attachment relationship shared between mother and child, with higher scores indicating secure attachment type. The mother attachment subscale has three factors originally viz: trust, communication, and alienation.

Sample design

Sample was selected using stratified random sampling from students comprising of both male and female students studying in class XI of Co-ed schools (both government and private) located in 10 districts of Delhi. The schools were identified using computer generated random sampling method.

STATISTICAL AND PSYCHOMETRIC EXAMINATION

Factor analysis

Factor analysis was conducted for the present study. Both EFA and CFA were conducted to assess and evaluate the factor structure and confirm items within the Indian context. Factor analysis is a statistical technique that can be used to identify underlying patterns of variation in a set of data, thereby reducing greater number of variables to a smaller number of factors accounting for majority of the variance in the data. This is useful for tool standardization, as it helps to identify the key dimensions thereby increasing the efficiency, validity, and overall effectiveness of the tool.

Advantages of factor analysis:

- Helps to identify the key dimensions of the tool that will be used for measuring a particular construct. It aids in revision and upgrading of the tool also making it more user cand culture friendly.
- It helps to identify those items which are not contributing much to the measurement of a particular construct and hence can be removed or deleted from the original tool, aiding in shortening of the tool and making it more concise.
- It helps in comparison of different tools and measurement models thereby specifying the strengths and weaknesses of each tool.

Results and findings of EFA

Table 1. Rotated factor loading of MAI

Item no.	Content	Factor Loadings
5	I like to get my mothers point of view on things I am concerned about.	.815
13	My mother trusts my judgement.	.765
7	My mother can tell when I'm upset about something.	.633
20	My mother understands me.	.518
12	When we discuss things, my mother cares about my point of view.	.465
17	I feel angry with my mother.	-.811
16	I tell my mother about my problems and troubles.	.746

19	My mother helps me to talk about my difficulties.	.573
21	When I am angry about something, my mother tries to be understanding.	.529
25	If my mother knows something is bothering me, she asks about it.	.508
2	I feel my mother does a good job as my mother.	.672
22	I trust my mother.	.623
24	I can count on my mother when I need to get something off my chest.	.604
6	I feel its no use letting my feelings show around my mother.	.548
14	My mother has her own problems, so I don't bother her with mine.	.737
1	My mother respects my feelings.	.707
4	My mother accepts me as I am.	.607
15	My mother helps me to understand myself better.	.535

Four factors were obtained from the Exploratory Factor Analysis (EFA) using Principal Component Analysis with varimax rotation based on Kaiser criterion. The rotated component matrix showcasing all factor loading factor-wise is presented in the table above. Six items were deleted from the original scale due to various factors such as low communalities, cross loadings etc. the items excluded further reflected their non-consistency with the general factor structure of MAI in the Indian context. The items selected represented a total variance of 63.94%.

About CFA

The Confirmatory Factor Analysis confirms the four-factor structure. The goodness of the model fit is confirmed from the fitness parameters such as CFI=0.94 and RMSEA=0.84. The CFA path diagram is shown below (unstandardized estimates).

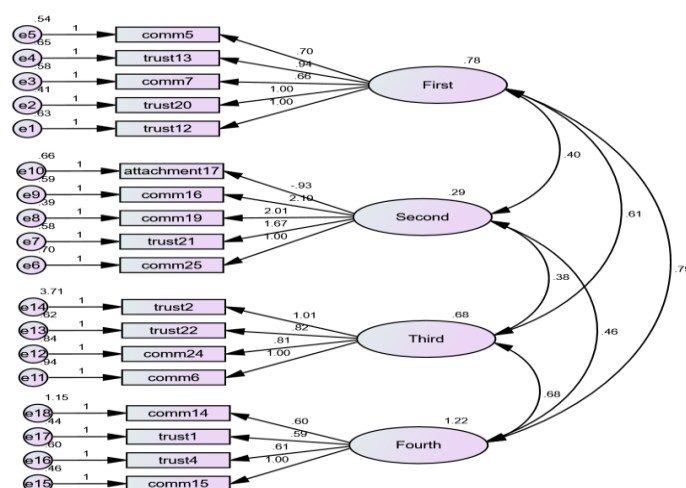


Figure 1. Path diagram of MAI

Scale reliability and validity:

Cronbach Internal stability

Cronbach's α coefficient is the measure of internal consistency of a scale. It indicates how the selected items on the scale are closely related to each other and is indicative of whether the scale measures what it intends to measure. The acceptable values of Cronbach's α coefficient is greater than 0.70 (Nunnally, 1978). Higher values indicate higher internal consistency of the scale. As Cronbach's α coefficient is not the perfect measure of validity, other forms of validity must also be focused on. The Cronbach alpha coefficient for all the identified factors and items is reported between 0.71 - 0.90. The temporal reliability of the scale was demonstrated through the test-retest method.

LIMITATIONS OF PRESENT STUDY

Every research study has some limitations owing to time constraints, cost involves, limited access to participants and ethical considerations, to name a few. Similarly, this study also has certain limitations which limit the result generalizability of the findings.

External factors: certain events and factors which were outside the control of the researcher include: vacation time for students, COVID-19 related restrictions during data collection. The researcher had to depend on both online and offline modes of data collection.

Sample size: the sample size selected for the present study was restricted to 250 students (based on the 10% rule by Cochran, Radzivin).

Geographic location: The schools targeted for data collection are in Delhi (across 10 districts namely East, West, North, South, North-west, North-east, South-west, South-east, New Delhi and Central Delhi).

RECOMMENDATIONS AND FUTURE ISSUES:

The findings of the present study can be utilized towards mother-child attachment relationships by examining the influence of parenting styles on the formulation of attachment relationships and styles. This study can be further used to examine the effect of the geographic and other demographic data on the attachment style. The findings generated from the present study can also be used to formulate parent training programs, within child psychology clinics, these can be utilized to develop training.

The proposed tool which is named as Maternal Attachment Inventory (MAI), standardized in Indian conditions can be utilized for parent and teacher training programs to develop and foster strong, secure, positive attachment relationships among adolescents and mothers. This tool can support the development of deep emotional bonds right from the early years to the adulthood years. Such kind of tools can also support the development of our understanding of attachment relationships and attachment bond formation, thereby aiding in positive development of children during formative years and adolescence which will further support the formation of better relationships in adulthood. Attachment relationships also influence student mental and physical wellbeing; hence such tools can have wider consequences in supporting formation of positive relationships and prevention of student suicides.

CONCLUSION

The present study proposes MAI, based on psychometric and statistical investigations carried out in under Indian conditions with students selected using stratified random sampling from co-ed senior secondary schools located in Delhi. The scale is expected to be useful for researchers, trainers, teachers, and parents of adolescents and can be used in educational, home, clinical settings helping the teachers and trainers to reflect on measures needed for development of stronger emotional bonds among parents especially mothers, commonly known as the primary caregiver and the child. This scale will utilize the experiences and responses of adolescents to identify and measure the type and extent of attachment bonds formed during young ages.

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CONFLICT OF INTEREST: None

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