Exploratory Factor Analysis of Home Environment Inventory

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ABSTRACT *Exploratory factor analysis is one of the statistical methods used for identifying latent structures underlying a construct constituting many variables in social science researches. This study is an attempt in that line for the dimensional reduction of Home environment Inventory originally prepared by K. S. Misra. Pricipal axis factoring via "promax" rotation yielded mainly three factors out of the ten variables of Home Environment Inventory. First factor was termed as "Positive Home Environment" which represented the variables Protectiveness, Nurture and Reward. The second one constituting the variables Conformity, Punishment, Control and Permissiveness was termed as "Disciplinary Home Environment". And the third factor stood for "Negative Home environment" as it comprised Social-Isolation, Rejection and Deprivation of privileges in the homes of adolescents.*

Researches in modern psychology have made it possible the measurement of psychological ambiance encompassing a family and the quality assessment of the same in terms of standards provided by empirical findings in the area of mental health. From the perspective of individuals engaged in different relationship roles the psychosocial ambiance prevalent in the homes will be different. For example, disciplinary environment of home as reported by an adolescent need not be in par with that rated by his/her siblings owing to the differentiated parental approaches in disciplining their wards, respecting the individual characteristics of each child. Still, researchers in adolescent psychology are interested in peeping into the home environment of adolescents through the eyes of adolescents themselves. It is due to the fact that psychological environment of home can have direct impact on the developmental outcomes on this turbulent phase of growth, (Jagapreeth Kaur ,2013; Forman and Forman, 1981; Hayward G ,1975; Moore,2000. etc). Also, knowledge about how adolescent feels about their home in a particular culture will help while dealing with protective as well as risk factors in adolescent mental health and well-being.

In India where collectivistic aspects of culture are cherished more than anything, psychological environment of home has a tendency to gravitate towards parenting attitudes, beliefs and practices. As, the permissible span of individualism or autonomy for a member of family is too narrow compared to the western families, the collective ambience of home is imbued with attitudes and demands from elders which force an adolescent to conform to his family rather than to have an independent stance (Verma & Saraswathi, 2002). Hence, the psychosocial environment of home for an adolescent is something totally saturated with the parenting and the conglomeration of his own emotional responses built upon it which is in turn ingrained in his unique perceptions about the parental approaches and practices.

In 2005, Karuna Shanker Misra, Prof. & head, department of Education, Allahabad University developed a home environment inventory for adolescents belonging to Indian territory. The inventory consists of 100 items each depicting the usual practices that are extant between the ado-

lescents and their parents. Through the responses of adolescents to these items, the five point likert scale with response options ranging from "Mostly" to "Never" estimate the pattern of psychosocial atmosphere of home along ten dimensions. Dimensions are control, protectiveness, punishment, conformity, social isolation, reward, deprivation of privileges, nurturance, rejection, and permissiveness. The inventory claims high reliability and validity and gives specific operational definitions of the variables constituting ten subscales. Each subscale consist ten items

On closely perusing the these ten variable researcher found that, some of these contribute to positive, nurturing environment of home while stringent negative practices like social isolation, deprivation of privileges are potential enough to be addressed as pathological elements in home environment while dimensions like control and conformity reflect the disciplinary practices of home. So an attempt for the dimension reduction of these ten variables may bring forth some latent factors common to different set of variables. This will provide brevity and facilitate the interpretation and analysis of home environment. By doing so we hope, that the comprehension of the outcomes of statistical output will be more lay man oriented which will increase the likelihood of practical applications of observed empirical facts. Such an analysis of this Home environment inventory is the first of its kind.

Instrument
The psychological Environment of the homes of participants were assessed using Home Environment Inventory (HEI) Prepared by Karuna Shankar Mishra. It consists of 10 subscales namely, A-Control, B-Protectiveness, C-Punishment, D-Conformity, E-Social Isolation, F-Reward, G-Deprivation of privileges, H-Nurturance, I-Rejection and J-Permissiveness. It is a 5 point Lickert scale and each subscale contains 10 questions. The responses ranged as "Mostly"-- "Often"—"Sometimes"—"Least"---"Never" Home Environment Inventory (HEI) claims high content as well as criterion related validity. Established reliability coefficient of each dimension are A-.879, B-.748, C-.947, D-.866, E-.870, F-875, G-.855, H-.901, I-.841, J-.726 respectively.

Participants

Participants consisted of 325 adolescent students selected from six higher secondary schools of Thrissur district of Kerala state. The mean age of participants was 15.84. There were 145 girls and 180 boys in the sample. 120 students were from aided schools and 105 from private sector the rest 100 students belonged to government higher secondary schools.

Method

The Home environment Inventory was distributed among students after getting informed consent from the school authorities and parents. Students were given instructions regarding the purpose and the way of responding to the items. Doubts raised during the answering session were clarified properly. After scoring, and cleansing data for outliers, of the 343 students, 325 were retained for analysis.

Exploratory factor analysis was executed with the help of SPSS version 20. "Principal axis factoring" (PAF) method was opted for extraction of factors with Eigen value greater than one as it yielded more meaningful cluster of factors over principal component analysis (PCA) Oblique rotation "promax" was selected considering the inevitability of correlation between the variables (Williams, B., Brown, T., & Onsman, A. 2010).

Results

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .756. Bartlett's Test of

Sphericity yielded significant value for chi-square (chisqure= 993.633, P=.000) (Table:2) indicating the appropriateness of correlation between the variables in order to apply factor analysis for dimension reduction.

Three factors were extracted with eigen values 2.91, 2.51 and 1.04 indicating 64.57% of total variance together (Table:3). Scree plot confirmed the presence of three factors. Factor score correlation matrix justified the selection of oblique method that is "promax". The correlations were substantially significant. In factor 1 of the structure matrix, Control, Punishment, Permissiveness and Conformity were clustered with loadings .626, .769, .517 and .322 respectively. Factor 2 suggested loadings .677,.841 and .724 respectively for the dimensions Protectiveness, Nurture and Reward. Meanwhile factor 3 constituted Rejection, Deprivation of privileges and Social isolation with respective loadings of .687, .680 and .731 (Table:4).

Table:1 Descriptive Statistics

Variables	Mean	Standard Deviation
A	18.03	5.888
B	25.62	6.212
C	23.80	6.168
D	30.22	4.818
E	8.48	5.553
F	29.11	5.873
G	8.01	4.621
H	22.75	5.697
I	10.38	5.248
J	19.22	6.109

A-Control, B-Protectiveness, C- Punishment, D-Conformity, E-Social Isolation, F-Reward, G-Deprivation of privileges, H-Nurturance, I-Rejection and J-Permissiveness

Table :2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.756
Bartlett's Test of Sphericity	Approx. Chi-Square	993.633
	df	45
	Sig.	.000

Table:3 Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Loadings[a]
	Total	Variance%	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.905	29.054	29.054	2.409	24.094	24.094	2.284
2	2.508	25.079	54.133	2.107	21.066	45.160	2.069
3	1.044	10.438	64.571	.441	4.409	49.569	1.883
4	.861	8.607	73.178				
5	.634	6.338	79.516				
6	.501	5.015	84.531				
7	.448	4.481	89.012				
8	.418	4.178	93.190				
9	.373	3.732	96.922				
10	.308	3.078	100.000				

Extraction Method: Principal Axis Factoring.
a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

A-Control, B-Protectiveness, C- Punishment, D-Conformity, E-Social Isolation, F-Reward, G-Deprivation of privileges, H-Nurturance, I-Rejection and J-Permissiveness

Table:4 Structure Matrix

	Factor		
	1	2	3
A	.626	.289	.175
B	.464	.677	-.200
C	.769	.242	.335
D	.517	.262	.165
E	.610	-.145	.687
F	.244	.841	-.339
G	.520	-.139	.680
H		.724	-.286
I		-.359	.731
J	-.322		

A-Control, B-Protectiveness, C- Punishment, D-Conformity, E-Social Isolation, F-Reward, G-Deprivation of privileges, H-Nurturance, I-Rejection and J-Permissiveness
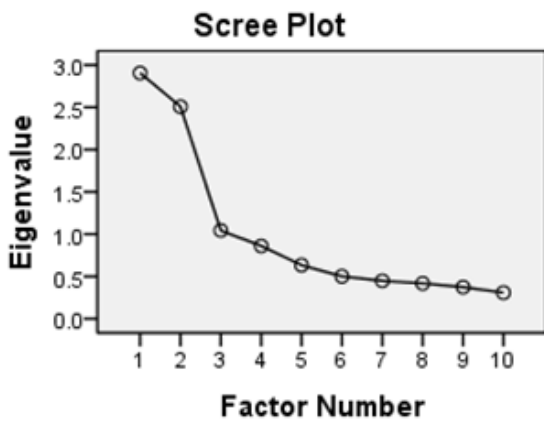
Figure:1

The Factor1 constituting four dimensions namely, Control, Punishment, Permissiveness and Conformity in the home environment reflected the disciplinary practices. It was named as "Disciplinary Environment" Factor 2 suggested a latent structure constituting positive qualities like Nurture, Reward and Protectiveness that enhances psychological well-being of adolescents, it was termed as "Positive Environment". While extreme form of disciplining characterized by

Rejection, Deprivation of privileges and Social isolation are capable of incurring negative impact in the developing personality of adolescents they came under the rubric of "Negative Home environment". The naming of factors were done in tandem with the operational definitions of the ten variables as per the manual of home environment inventory. -

Discussion
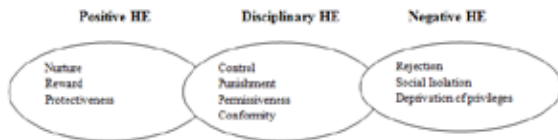
Diagrammatic Representation of Latent Structures In Home Environment Variables

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